EXPORT DIVERSIFICATION, FINANCIAL DEVELOPMENT AND ECONOMIC GROWTH IN ECOWAS

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ABSTRACT

Most economic scholars maintain that natural and environmental resources availability in an economy can trigger growth if exported to other countries. Thus, international organizations like the World Bank and the International Monetary Fund (IMF) have continually extolled the virtues of economic prosperity based on export diversification. Export diversification driven by healthy financial development enables countries to build resilience to external shocks, stabilize export earnings and more. Motivated by the need to reduce vulnerability and external exposure, this paper explored the effect of export diversification and financial development on the economic growth of Economic Community of West African States (ECOWAS) countries from 1995 – 2022. The panel threshold method was adopted for data on GDP per capita, export diversification index, trade openness, foreign direct investment, financial development, external debt, natural resource rents, exchange rate, and population growth analyses. The data were sourced from secondary sources, such as the United Nations Conference on Trade and Development (UNCTAD) and the World Bank's World Development Indicator (WDI) databases. The analysis of the data revealed that while export diversification supports economic growth in the region, a well-developed financial system is needed for export diversification to be pro-growth. The panel threshold method equally indicated that financial development above 24.7814% (broad money to GDP) is required for the economic benefits of export diversification to be unlocked in most of the countries. This result seems to strengthen the need to develop the financial institutions of the ECOWAS countries. It is

expected that export diversification will only produce positive economic outcome if the financial system is efficient and inclusively developed. The paper recommends that increased allocation of credits to the real sectors of the economy will boost export commodities availability and enhance economic growth.

1. Introduction

The high degree of economic interdependence amongst nations is widely accepted in economic literature. Like Carbaugh (2019) puts it, in today's world, no nation exists in isolation. All aspects of a nation's economy — its industries, service sectors, levels of income and employment, and living standard — are linked to the economies of its trading partners. In most cases, these economic activities are undertaken to achieve economic growth and prosperity. Achieving rapid and sustainable economic growth therefore is amongst the goals of fiscal and monetary policy makers. To achieve this goal, international trade and export-led growth models are relied upon. The conventional notion behind trade-fuelled economic growth however is contradictory and broad especially as it relates to the type of trade countries should undertake and consequently the goods that should be produced.

In the Economic Community of West African States (ECOWAS) region, as is the case in most sub-Saharan African countries, the economies of the countries are beleaguered by weak demand which is inadequate to bolster and sustain economic growth. Recognizing this challenge, some theories of international trade, namely the Ricardian and Heckscher-Ohlin models support either comparative or relative advantage of a country, emphasizing factor accumulation and specialization based on endowment abundances, allowing for production at relatively lower cost and increased export volume (Jongwanich, 2020).

Over the last six decades, several scholarly works seem to suggest that at the aggregate level, the adoption of export specialization grants countries comparative advantage, by fostering efficient allocation of resources.

Furthermore, specialization promotes trade with richer countries, which may improve the export volume of developing countries arising from the higher income of the importing countries (Ricardo, 1817; Munir and Javed, 2018). These views have been questioned, with scholars highlighting limitations to the policy dossier of export specialization promulgated by the classical trade theorists. For developing countries, which include the 14 ECOWAS members, export specialization is characterized as a possible conduit for the transmission of the resource curse, a term that defines the tendency of countries with large storehouses of mineral resources to underperform economically in the long run (Aliet al., 2023).

John et al. (2020) and Ross (2019) noted that, a bullish extractive sector more often reduces export diversification and this is perpetuated through a confluence of Dutch Disease effects, namely currency appreciation, soaring inflation and reduced competition, potentially dwarfing economic growth. There is a high tendency that countries that are less diversified or have a high degree of specialization may grow slowly as they are less incentivized to sustain their market share through innovation (Ali et al., 2023). The argument and recommendation of classical trade theorists that countries should specialize in the production of comparatively advantageous products, some have suggested, may not hold in an environment of uncertainty, as such ambience will reduce global trade as risk-adverse producers of primary products scale back production (Naudé and Rossouw, 2011; Brainard and Cooper, 1968; Derosa, 1992). Export specialization leaves countries exposed to price fluctuation and commodity shocks, increases export revenue volatility, causes decline in terms of trade, discourages FDI inflows resulting from limited economic growth, and fosters an institutional framework that is inferior (Ali et al., 2023; Benli, 2020).

The aftermath of the global financial crisis and the pandemic of 2019 has called up concern and discussion about the susceptibility of countries to possible effects of external shocks. The domestic growth strategy of export-fuelled growth model has been suggested as a viable policy prescription for developing countries, particularly those specialized in mineral commodities. At the heart of this policy advice is the diversification of the export baskets of such countries (Jongwanich, 2020; Siswana and Phiri, 2021; Gözgör and Can, 2017).

This policy prescription is based on the virtues arising from having a diversified export basket strengthened by sound financial development. One of such is that export diversification hedges countries against unanticipated shocks in specific product markets and perennial commodity price fluctuations. Second, the expansion ensuing from diversifying the export basket reduces average production prices, causing an upward shift in productivity, which engenders economic growth. Third, export diversification improves skills and technology, reinforcing growth in total factor productivity, mainly through technical efficiency or learning-by-doing (Siswana and Phiri, 2021; Rath and Akram, 2017; Di Giovanni and Levchenko, 2010; Hammouda et al., 2010). More specifically, export diversification has been linked to innovation, as it stimulates competition and fosters development of new products (Ali et al., 2023). By preventing the concentration of power in a few hands through raising multiple economic stakeholders that can demand accountability, transparency and probity, export diversification can help build stronger institutions (Ali et al., 2023; Acemoglu and Robinson, 2012). In addition, a broader export basket can reduce in the long term the degree to which less-developed countries depend on advanced economies for manufactures. In all, export diversification is believed to be a catalytic agent for economic growth, with empirical studies alluding to higher output levels fed by diversified export baskets (Matezo et al., 2021; Gözgör and Can, 2017; El Hag and El Shazly, 2012; Alshomaly and Shawaqfeh, 2020; Shadab, 2021; Duhu, 2021; Thavarajah and Chin, 2022).

Although export diversification is recognized as a strategic engine for returning higher output level, there is evidence that the process of getting palpable economic growth from export diversification is nonlinear (Mazengia et al., 2023; Yakubu et al., 2022; Munir and Javed, 2018; Aditya and Acharyya, 2013; Cadot et al., 2011; Naudé and Rossouw, 2011). Mazengia et al. (2023) noted that one factor among the myriad hindrances of diversified export baskets is lower financial development. Export diversification, relative to primary production, often involves firms taking on upfront fixed costs and investment projects that have longer gestation periods, thus requiring greater liquidity. Exporting firms are faced with credit constraints during the development of new products and also when installing new technology for product diversification (Shakib et al., 2023).

As noted by Saleem et al. (2022), the financial institutions can contribute to product and export diversification by extending credit to exporting firms. As suggested by Mazengia et al. (2023), the liquidity crisis, which is a challenge to export firms, can be mitigated by a well-developed and stable financial system, which will make funds available at reduced cost, advance export diversification and increase economic activities. Shakib et al. (2023) and Minetti and Zhu (2011) share the same view, noting that significant investment is required to explore external markets, set up distribution channels or networks, and ensure products are modified in a manner that meet regional preferences. One cannot gainsay the assertion that, a developed financial sector is a major prerequisite to provide the finance to foster export diversification which induces economic growth. Accordingly, this paper investigates the role of financial development in the relationship between export diversification and economic growth for 14 ECOWAS countries using the Hansen (1999) panel threshold regression model.

This study makes significant contributions to the literature. First, in consideration of how export diversification affects economic growth, past studies predominantly explored the linear link between the variables; however, financial development can accentuate the effect of export diversification on economic growth. Therefore, this study complements existing literature by exploring the role of financial development which may give insight into the extent to which financial development aids export diversification in delivering higher economic growth. Second, the study provides information on the differentiated effect of export diversification on economic growth in a repressed and well-developed financial sector environment. Third, the study uses the panel threshold model to analyse the nonlinear relationship estimating the level of financial development that ensures that export diversification exerts a promotional effect on economic growth. By identifying this threshold, the study provides a benchmark for monetary authorities and government to know the financial section conditions required for export diversification to catalyze economic growth.

The remaining sections of this paper are as follows: section 2 provides a review of the literature while section 3 presents the methodology of the study. Sections 4 and 5 present the analysis of results as well as concluding remarks.

2. Literature Review

2.1 Theoretical background

Concerns about the risks of operating a mono-commodity-based economy can be readily found in economic literature. Diverse economic theories exist on this subject and how best to create wealth and economic prosperity. Theoretically, the Solow (1956) growth model provides a theoretical basis for growing output level. The model considers capital and labour, where technology is determined exogenously, to be catalytic agents for economic growth. This theory suggests that countries can strengthen economic growth by either increasing their domestic capital stock, labour, or a combination of both.

Historically, the discussion around export diversification and its potential effect on economic growth is rooted in the work of Ricardo (1817), as he advocated for specialization in trade, which grants countries comparative advantage over their trading partners. The theoretical submission of Ricardo (1817) has been advanced by Heckscher (1919) and Ohlin (1933), who argue that international trade can translate into or fuel economic growth when a country specializes and exports products that grant it comparative advantage, determined by the resource abundance of such country (Siswana and Phiri, 2021). While economic growth has been related to comparative advantage by the classical theorists, the structural change theories emphasize diversification of exports, arguing that developing countries can export their way to higher income levels. Prebisch (1950) and Singer (1950) were the first to champion this, now termed the Prebisch-Singer hypothesis. They argued that for developing countries to achieve strong economic growth prospects and rapid industrialization, they will need to diversify the composition of their exports from primary to manufactured products (Shadab, 2021).

According to Prebisch's (1950) assertion, the price elasticity of demand for primary products is low and where export volume is not raised substantially, export income may drop steeply as prices fall. Thus, diversifying to manufacturing exports will foster industrialization and reduce the risk of price volatilities of primary exports (Alshomaly and Shawaqfeh, 2020; Shadab, 2021). Export diversification permeates to growth through several channels. First, it lessens the problem that causes frequent deterioration of developing countries' terms of trade. Second, it hedges

against instability in global demand and price fluctuation. Third, export diversification which requires more trained labour, will drive economic growth through upscaled technology, as new ideas and products will be developed by additional human capital (Carrasco and Tovar-García, 2021).

2.2 Literature review

Benli and Gültekin (2025) in assessing how export diversification affects economic growth in Turkey, demonstrated that export diversification is a catalytic agent for economic growth, as the fixed and random effects results show that an increase in export diversification results in higher levels of per capita income. They also confirmed that higher industrial production and public investment facilitate economic growth. Olure-Bank et al. (2024), studying how export diversification influences economic growth in 15 ECOWAS countries from 1984 to 2020 found, using the fixed effects method, that export diversification dampened economic growth. Economic growth as established through the empirical analysis is buoyed by increased manufacturing activities. In Bangladesh, Azam and Azam (2023) used the autoregressive distributed lag (ARDL) method to prove that export diversification is a factor that determines economic growth, noting that a diversified export basket produced economic tailwinds in the long run, though insignificantly affecting economic growth in the short run. Zhou and Nyandoro (2023), applying the autoregressive distributed lag (ARDL) method document that export diversification is a strong pillar for achieving economic prosperity, as they show that an increase in export diversification fostered growth of Zimbabwe's GDP per capita. They also noted that Zimbabwe's economic growth was influenced positively by increased capital and high level of human capital. Aderounmu et al. (2023) empirically confirmed that horizontal export diversification creates economic tailwinds in Nigeria in the long run. Their autoregressive distributed lag (ARDL) results indicate economic growth catalyzed by vertical export diversification in the short and long runs.

   Kalaitzi and Chamberlain (2023), using the Toda and Yamamoto causality approach, showed proof that disaggregated imports, manufactured exports, and production inputs predict short-run economic growth in Kuwait.

They found that expansion of primary and manufactured imports promotes export diversification. Harighi et al. (2023) studied the effect of financial development on export diversification for 54 developing countries from 2005 – 2018. The system GMM results revealed a significant positive effect of financial development on export diversification, as an increase in broad money and credit to the private sector increased the diversity of exports. With data from Sudan covering 1960 – 2018, Ali et al. (2023), using the VAR framework, found no evidence that export diversification is a catalytic agent for economic growth. Effiong and Orebiyi (2023), who applied the pooled mean group (PMG) method to data of 10 West African countries from 2007 – 2020, concluded that export diversification undermined economic growth in the economies studied.

Canh and Thanh (2022) explored the dynamism between export diversification, economic complexity and economic growth cycles for 70 countries from 1996 – 2014. The results of the Granger causality test revealed a bidirectional causal link between economic complexity and export diversification, whereas economic complexity was found to predict economic growth cycles. Markakkaran and Sridharan (2022) made interesting discoveries when they studied the export diversification-economic growth nexus in 101 countries from 1995 to 2019. The system generalized method of moments (GMM) results indicated that increased export concentration repels economic growth momentum. They established that export diversification is nonlinearly related to economic growth, contending through empirical analysis that export diversification substantially contributes to economic growth in low- and lower-middle income countries. In high- and upper-middle-income countries, they pointed out that export specialization catalyzes economic growth. Thavarajah and Chin (2022), using the VEC framework showed that export diversification had economic growth impetus for the Malaysian economy from 1987 – 2017. In a related study, Matezo et al. (2021), through the system generalized method of moments (GMM) showed that a diversified export basket provides stimuli for accelerated output expansion for a sample of fifteen SADC (Southern African Development Community) countries over the period 1998 – 2018. Their study emphasized that the potential for output growth in the regional countries also rests on a stable political environment and increased physical and human capital.

Yakubu et al. (2022) contrasting from previous work, studied the nonlinear effect of export diversification on the economy of the G7 countries from 1995 – 2018, probing the moderating role of exchange volatility in the relationship between export diversification and economic growth. Using the fully modified and dynamic OLS methods, they established that export diversification fosters economic growth, but an environment of high exchange rate volatility weighs down such economic growth momentum.

Siswana and Phiri (2021) used the fully modified OLS, dynamic OLS and pooled mean group (PMG) methods to explore whether export diversification or specialization benefits the economy of a sample of BRICS countries from 1995 – 2017. They report that export concentration relative to diversification is a better trade objective as it improves economic growth. Duhu (2021), using the autoregressive distributed lag (ARDL) estimator, argued in support of export diversification having a positive effect on economic growth in Nigeria, but the effect is insignificant. Trinh and Thuy (2021) conducted threshold analysis on data of 44 emerging markets and developing economies, analysing whether export diversification was nonlinearly related to economic growth from 1995 – 2015. Their results support nonlinearity as a diversified export portfolio stimulates economic growth when the degree of export diversification is below 0.060 (for HHI index) and 2.069 (for THE index). Thuy (2021), who studied the economy of Thailand and Vietnam from 1997 – 2019 using the OLS, averred that export diversification fostered economic growth. However, Duhu (2021), using panel cointegration and causality test, found a mixed outcome pertaining to the causal link between export diversification and economic growth for a panel of 19 emerging economies from 1995 – 2017. A two-way causal relationship between export diversification and economic growth was documented for Saudi Arabia, Malaysia, Brazil, India, the Philippines, China, Mexico, Nigeria, and Indonesia, while evidence of diversification being driven by economic growth was reported in Iran, Bangladesh, Argentina, and Egypt.

Carrasco and Tovar-García (2021) examined a panel of 19 developing countries using the difference GMM estimator. The results show that import of high-tech and capital goods enhance economic growth, while export composition and diversification posted insignificant effect on economic growth. Applying the Toda and Yamamoto causality test and vector error

correction (VEC) method to data from Saudi Arabia from 1975 – 2017, Shadab (2021) showed that export diversification stimulates economic growth and that economic growth is also import-led. Amjed and Shah (2021) demonstrate with the ARDL method that a developed financial system and economic growth induces trade diversification in the Sultanate of Oman in the short- and long run, while capital formation hamper trade diversification. Their finding that financial development fosters a more diversified export bundle was substantiated by Mazengia et al. (2023) to be valid in Ethiopia using the ARDL method. Yuni et al. (2020) who used the fixed effect method to analyse panel datasets of 39 sub-Saharan African (SSA) countries from 2000 – 2017 concluded that export diversification boosts economic growth in low-middle-income countries, but not in low-income ones, while it insignificantly dampened economic growth in the upper-middle-income countries studied. Jongwanich (2020) used the system GMM estimator on data from Thailand for the period 2002 to 2017 to explain industrial economic growth from the twin factors of export diversification and margins. The report avers that export diversification instrumentally scaled up industrial output, but the expansion was only visible in certain industries, namely plastics and rubber, electronics, and automotive and chemicals. The result keenly shows that specialization help foster economic growth in textiles and apparel and processed food.

Alshomaly and Shawaqfeh (2020) investigated how export diversification transmits to economic growth for a panel of 11 West Asian Arab countries from 2000 – 2017. They provided evidence of reciprocal causal link between exports diversification and economic growth. Using the OLS and FMOLS methods, they identified export diversification, strong institutions, export of primary products and high-quality human capital as drivers of economic growth, noting that higher trade openness and population growth produce economic headwinds. ClaverKouakou and N'Zué (2020) established through the autoregressive distributed lag (ARDL) method that export diversification and investment accelerate economic growth in Cote d'Ivoire. From 1995 to 2018, the ARDL results demonstrate that increased labour force participation significantly reduced economic expansion. Espoir (2020) suggests, using the panel fully modified OLS (FMOLS) method, that foreign direct investment, trade openness and human capital enhance export diversification in 16

Southern African Development Community (SADC) countries. According to the FMOLS results, higher price levels were unfavourable to the diversification process.

Alomari and Bashayreh (2020), applying the PMG estimator to data from six (6) GCC (Gulf Cooperation Council) countries from 1992 – 2017 established that export diversification has a long-run economic growth stimulative effect. Analysing the economy of Morocco from 1980 – 2015, Lotfi and Karim (2017) resolved using the VEC method that diversification of Morocco's exports provides a lever for economic growth. Murphy-Braynen and Thurman (2019) argued using the feasible GLS method that economic growth for 100 countries studied respond nonlinearly to export diversification. As unravelled by the result, SIDS (small island developing states) and non-SIDS countries with large export product spread have higher pace of economic growth. Interestingly, they reported that population growth strengthens the economic growth-driving effect of export diversification. For a sample of 4 South Asian countries studied from 1990 – 2013, Munir and Javed (2018) used the fixed effect method to show nonlinearity in how export diversification influences economic growth, arguing that export diversification has economic growth catalyzing effect, but after a threshold export specialization drives up economic growth. Gözgör and Can (2017) showed by causality test that economic growth is driven by export diversification for a sample comprising 139 countries. From 1970 – 2010, their result portrayed a two-way causal link existing between globalization and economic growth.

In Ethiopia, Tesfay (2016) using the ordinary least squares applied to data covering 1980 – 2012 showed that fewer export variety created an insignificant economic headwind. Using data of 158 countries split into subgroups and the system GMM method, Gozgor and Can (2016) observe that economic growth in the low-, lower middle- and upper middle-income economies is buoyed by export diversification. In non-OECD and OECD high-income economies, their estimation portrayed product concentration as having economic growth-expansionary effect. In Nigeria, Esu and Udonwa (2015) through error correction modelling find export diversification as expansionary and foster economic growth. Elhiraika and Mbate (2014) using the system GMM estimator outlined human capital, per capita income,

infrastructure, institutions and policies, and public investment as factors determining export diversification for 53 African countries. Aditya and Acharyya (2013) using the system GMM method for a panel of 65 countries, showed that at a lower threshold export diversification induce economic growth, but above such threshold economic growth can only be driven by export specialization.

Nicet-Chenaf and Rougier (2011) estimating data from 1995 – 2005 with the system GMM method established that export discoveries and not trade diversification catalyze economic growth in 8 MENA countries. Hodey et al. (2015) showed using the system GMM method that economic diversification generates economic growth for a panel of 42 sub-Saharan African countries. The results of Akram and Rath (2017) also suggest that export product diversification catalyzes output growth in 28 emerging economies. Iwamoto and Nabeshima (2012) used the system GMM estimator to indicate that higher FDI inflows foster export diversification for a sample of 175 countries. For Rath and Akram (2017), their panel dynamic OLS and granger causality test results disclosed that the risk to economic expansion reduces as the export of the South Asian countries studied become more diversified. El Hag and El Shazly (2012) established that export diversification and greater trade integration accelerate economic growth for a panel comprising six (6) Arab Gulf countries. Naudé and Rossouw (2011) applied the granger test and applied general equilibrium (AGE) model in investigating whether export diversification has economic growth effect for a sample of BCIS countries, comprising Brazil, China, India, and South Africa, focusing on the time frame of 1962 – 2000. Their result revealed a U-shaped relationship between GDP per capita and export diversification. Also, through the causality test, they found export diversification foster economic growth in South Africa, Brazil and China.

3. Data and Methodology

3.1 Data

A sample of 14 ECOWAS countries was used in this study. They are: Benin, Burkina Faso, Cabo Verde, Côte d'Ivoire, The Gambia, Ghana, Guinea, Guinea-Bissau, Mali, Niger, Nigeria, Senegal, Sierra Leone, and Togo. The

time frame for the study was from 1995 to 2022. The choice of countries and period were influenced by data availability; Liberia was dropped from the panel constituent for this reason.

The data for the regression variables were retrieved from two sources. Real GDP per capita (Y), export product diversification index (EDI), foreign direct investment (FDI), population growth (POP) and inflation (INF) were sourced from the United Nations Conference on Trade and Development (UNCTAD); while broad money as % of GDP (financial development proxy, FD), trade openness (TPN), external debt (EXD), natural resource rents (NRR) and exchange rate (ECH) were obtained from the World Bank World Development Indicators (WDI).

3.2 Econometric procedures

Before carrying out the estimation where the threshold level of financial development was determined and the regime-changing effect of export diversification on regional economic growth ascertained, certain mandatory tests, such as slope heterogeneity, cross-sectional dependence, descriptive and unit root analysis were performed to provide guidance on the best suited estimator.

3.2.1 *Cross-sectional Dependence (CSD) and Slope Heterogeneity Test (HS)*

An issue that panel data is likely to suffer from is cross-sectional dependency. In the current dispensation of entrenched globalization, the operations of countries are becoming more intertwined as countries are increasingly becoming linked financially and economically. Thus, there is the risk of shock in one country spilling over and distorting economic activities in another country, which could cause interdependence of the error terms of the panels. Ignoring this problem will make the parameters biased and inconsistent. Therefore, the study addressed this problem and prevented prejudiced results by conducting a CSD test. To scrutinize for presence of CSD in the residuals, the Pesaran (2004), Friedman (1937) and Frees (1995) versions of CSD tests were performed.

Another problem that conflicts panel data and may cause the parameters to be inconsistent is slope heterogeneity. In panel analysis, conventional

analytical methods assume homogeneity. Heterogeneity may arise from abrupt variations in culture, religion, export policies, financial inclusion and economic growth policies, among others, affecting relations among the variables used. Hence, checking for heterogeneity in the panel model before estimating the model is necessary. The study relied on the heterogeneity test proposed by Levene (1960) and Brown and Forsythe (1974). Brown and Forsythe (1974) noted that the Levene (1960) statistic, W_0, which is obtained from the one-way ANOVA between groups, is not robust for skewed population, introducing W_{50} and W_{10} statistics. The null hypothesis of all three tests is equality of variances or homogeneity, specified as, $H_0: \sigma_1^2 = \sigma_2^2 \ldots = \sigma_n^2$, with n representing the number of panels.

3.2.2 *Panel Units Root Where CSD is Present*

Unit root in employed variables is expected to generate inflated inferential statistics and produce prejudiced results. In panel estimation, the identification of stability stage of the model variables is crucial in the choice of appropriate estimator. This is accomplished through unit root testing. This will ascertain whether the model variables return to their mean, which gives a sense of their integration process. The CSD test is helpful to determine whether to subject the concerned variables to the first- or second-generation unit root specification test. Conventionally, stability of modeled variables has been determined using first-generation tests, such as Levin, Lin and Chu (2002), Im, Pesaran, and Shin (2003), Hadri (2000), and Choi (2001). These tests, which presume independence of cross-sections, produce ambiguous and misleading results if CSD is present. In this study, stability is checked using the cross-section IPS unit root test (CIPS) developed by Pesaran (2007), as it conveniently addresses the problems of CSD and HS. The CIPS employs this equation:

$$\Delta m_{it} = \delta_i + \lambda_i m_{i,t-1} + \theta_i \bar{m}_{t-1} + \sum_{k=0}^{r} \theta_{ik} \bar{m}_{i,t-k} + \sum_{k=0}^{r} \theta_{ik} \Delta m_{i,t-k}$$
$$+ \varepsilon_{it} \tag{1}$$

where: $\bar{m}_{t-1}$ is the panel's averages. The equation is used to obtain CADF for each unit and the t-statistics averaged on the lagged values, $CADF_i$, to get the CIPS statistics (Baltagi and Baltagi, 2008).

$$CIPS = \frac{1}{N} \sum_{i=1}^{N} CADF_i \tag{2}$$

3.3 Analytical model

The theoretical framework which was used in examining the effect of export diversification on the economy of the 14 ECOWAS countries is the neoclassical production function, wherein economic growth is achieved through capital, labour and technology.

$$Y_{it} = A_{it}(K_{it}, L_{it}) \tag{3}$$

where:

Y_{it} = total output
K_{it} = capital
L_{it} = notation for labour
A_{it} = contribution of other factors other than K_{it} and L_{it} to economic growth

There has been augmentation to this theoretical model when attempts were made to predict economic growth from factors other than labour and capital. This study follows suit, showing that export diversification can be vital to economic growth, and adopting the endogenous growth theory.

The growth model is defined in line with the specification below:

$$y_{it} = f(EDI_{it}, V'_{it}) \tag{4}$$

The linear function of Equation (4) is converted into a linear econometric form as follows:

$$lny_{it} = \theta_i + \delta_1 EDI_{it} + \delta_2 V'_{it} + \varepsilon_{it} \tag{5}$$

With V'_{it} serving as k dimensional vector of control variables; y_{it} as real GDP per capita; EDI_{it} as export product diversification index, ε_{it} as error term; and θ_i as ECOWAS-specific effect, Equation (5) expands to become:

$$lny_{it} = \theta_i + \delta_1 edi_i + \delta_2 tpn_{it} + \delta_3 fdi_{it} + \delta_4 inf_{it} + \delta_5 exd_{it} + \delta_6 nrr_{it}$$
$$+ \delta_7 lnech_{it} + \delta_8 pop_{it} + \varepsilon_{it} \qquad (6)$$

Then, to examine possible nonlinearity in the EDI-Y relationship, this study uses the panel threshold model introduced by Hansen (1999). To ensure this, the baseline model built is:

$$lny_{it} = \lambda_0 + \delta_1 edi_{it} \cdot I(edi_{it} \leq \pi) + \delta_2 edi_{it} \cdot I(edi_{it} > \pi) + \delta_3 tpn_{it}$$
$$+ \delta_4 fdi_{it} + \delta_5 inf_{it} + \delta_6 exd_{it} + \delta_7 nrr_{it} + \delta_8 lnech_{it}$$
$$+ \delta_9 pop_{it} + \varepsilon_{it} \qquad (7)$$

To incorporate financial development (FD) in the model, Equation (7) is modified and FD is interacted with EDI to give the reconstructed model:

$$lny_{it} = \lambda_0 + \delta_1 edi_{it} \cdot I(fd \leq \pi) + \delta_2 edi_{it} \cdot I(fd > \pi) + \delta_3 tpn_{it}$$
$$+ \delta_4 fdi_{it} + \delta_5 inf_{it} + \delta_6 exd_{it} + \delta_7 nrr_{it} + \delta_8 lnech_{it}$$
$$+ \delta_9 pop_{it} + \varepsilon_{it} \qquad (8)$$

fd is the threshold variable, which splits the sample into two regimes; π represent the threshold value, I is the function notation. As proposed by Hansen (1999), the threshold value is estimated using the least squares method and obtained from the minimization of the sum of squares error:

$$S_1(\pi) = \hat{e}_{it}(\pi), \hat{e}_{it}(\pi) \qquad (9)$$

4. Results and Discussion

Summary statistics for the variables are presented in Table 1. The statistics descriptively show that for the fourteen (14) ECOWAS countries, the average GDP per capita was US \$1,042.015, with a standard deviation of 719.277, depicting that economic performance across the units has been disparate, with some countries performing better than others. GDP per person ranged from US \$219 to US \$3,689. The ECOWAS countries have made strides in diversifying their export products as shown by the average value of 0.775 and

range of 0.561 to 0.901. However, the financial sectors of the countries remain underdeveloped, with an average broad money supply of 28.196% of GDP. Trade share of the regional countries' total output averaged 58.119% of GDP, edging up to 117.816 from 16.352% of GDP; the share of the regional countries' GDP invested by foreigners averaged 2.985% of GDP, with a range of -2.720% to 32.414% of GDP. The mean inflation value was 6.574%, as prices escalated to 72.98% and commodities prices deflated to -3.47%. Debt owed to external sources averaged 62.888% of GDP and this has ballooned to 506.036% from 6.99% of GDP. Exchange rate remained highly volatile, differing among countries as it ranged from 0.119 to 9,565.082. Receipts from natural resource exploitation and exploration varied from 1.971% to 49.205% of GDP among the regional countries. The pace of population growth averaged 2.623%, and grew by 5.79%. Table 1 revealed that there was no normality in all the variables considered and the variables are leptokurtic.

Table 1: Result of Descriptive Analysis

	Y	EDI	FD	TPN	FDI	INF	EXD	NRR	ECH	POP
Mean	1042.015	0.775	28.196	58.119	2.985	6.574	62.888	9.945	661.266	2.623
Max.	3689.000	0.901	117.191	117.816	32.414	72.980	506.036	49.205	9565.082	5.790
Min.	219.000	0.561	0.035	16.352	-2.720	-3.470	6.990	1.971	0.119	0.210
S.D	719.277	0.061	17.598	18.583	3.343	9.018	57.812	6.688	1368.588	0.641
SN.	1.611	-0.389	2.151	0.782	3.010	3.103	3.656	1.551	4.788	-0.082
KT.	5.032	3.248	8.483	3.476	20.257	16.890	22.104	7.277	26.675	6.651
J.B.	237.177	10.914	793.552	43.545	5456.577	3780.780	6835.007	439.889	10598.61	218.260
Prob.	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Obs.	392	392	392	391	392	392	392	378	390	392

Note: S.D = standard deviation; SN = skewness; KT = Kurtosis; J.B = Jarque-Bera; Obs. = observation
Source: Compiled by Authors (2024).

The correlation results displayed in Table 2 reveal significant correlation among most of the modelled paired variables. Moderate correlation exists between TPN and FD (0.522), and POP and FD (-0.511). The correlation values for the other paired regressors are less than 0.85, the threshold that

produces poor estimated coefficients (Gujarati and Porter, 2021). These results indicate that the regressors can be combined and modelled as there is no suspicion of collinearity.

Table 2: Results from Correlation Test

	Y	**EDI**	**FD**	**TPN**	**FDI**	**INF**	**EXD**	**NRR**	**ECH**	**POP**
Y	1.000									
EDI	-0.012	1.000								
FD	0.605*	-0.239*	1.000							
TPN	0.307*	-0.115*	0.522*	1.000						
FDI	0.126*	-0.138*	0.260*	0.379*	1.000					
INF	0.026	0.063	-0.178*	0.043	0.010	1.000				
EXD	-0.142*	-0.302*	-0.046	-0.029	-0.111*	0.2922*	1.000			
NRR	0.224*	-0.152*	0.295*	0.317*	0.167*	0.266*	0.249*	1.000		
ECH	-0.138*	0.195*	-0.120*	0.225*	0.044	0.076	-0.070	0.089	1.000	
POP	-0.515*	0.212*	-0.511*	-0.400*	-0.107*	-0.215*	-0.243*	-0.381*	-0.014	1.000

Notes: Y = GDP per capita; EDI = export diversification index; FD = financial development; TPN = trade openness; FDI = foreign direct investment; INF = inflation; EXD = external debt; NRR = natural resource rents; ECH = exchange rate; POP = population growth.

   * show confidence at 95%.

Source: Compiled by Authors (2024).

The result in Table 3 was estimated under the assumption of homogeneity of the intercept. As reported, diversifying the export basket has expansionary potentials, as the output of the ECOWAS countries is expected to grow by an average of 0.4775%, though the increase is not significant. As the economies of the countries studied become more open and fiscal policymakers pare back on trade restrictions, Table 3 suggests that this will significantly spur economic growth by 0.0050%. Furthermore, Table 3 reveals that ballooning external debt weighs down economic growth, with negative growth in output of -0.0030% effectuated by a 1% increase in external debt. Population growth dampens economic growth, as income per person declines by 0.4426% when population increases by 1%. In the pooled result, foreign direct investment,

natural resource rents and currency depreciation effectuate negative growth in output, but they yield insignificant impact on economic growth.

Table 3: Result of Pooled Regression

$Var.$	$coef.$	$st.Err.$	t	$p > |t|$
$edi_{i,t}$	0.4775	0.4409	1.08	0.280
$tpn_{i,t}$	0.0050***	0.0015	3.23	0.001
$fdi_{i,t}$	-0.0097	0.0083	-1.17	0.243
$inf_{i,t}$	0.0006	0.0032	0.19	0.850
$exd_{i,t}$	-0.0030***	0.0004	-6.30	0.000
$nrr_{i,t}$	-0.0001	0.0041	-0.03	0.973
$lnech_{i,t}$	-0.0160	0.0126	-1.27	0.203
$pop_{i,t}$	-0.4426***	0.0453	-9.76	0.000
c	7.5609	0.3811	19.84	0.000
R^2	0.3361		**F-Stat**. = 24.23[0.0000]	
Adj. R^2	0.3222			

Note: *, ** and *** show confidence at 90%, 95% and 99% respectively.

Source: Compiled by Authors (2024).

The findings reported in Table 4 confirm the proposition of heterogeneity as the p-value of Levene (1937) W_0 statistics of 7.8653 and the Brown and Forsythe (1974) W_{50} and W_{10} statistics of 7.3195 and 7.7435 are less than the conventional 5% level of significance. Thus, the alternative hypothesis that assumes heterogeneity exists is accepted. This means that the result of Table 3 is invalid as there is heterogeneity across the ECOWAS; subsequent methods incorporate this to avert inconsistent and skewed results.

Table 4: Result of Heterogeneity Test

Code	Mean	St. Dev	Freq.	Test Statistics
Benin	0.1581	0.2149	28	**W0** = 7.8653 $df(13, 378)$ Pr > F = 0.0000
Burkina Faso	-0.3416	0.2009	28	
Cabo Verde	0.4555	0.1267	28	
Cote d'Ivoire	0.5603	0.3898	28	
Gambia, The	-0.1531	0.1215	28	
Ghana	0.2066	0.2327	28	
Guinea	-0.3829	0.1253	28	**W50** = 7.3195 df (13, 378) Pr > F = 0.0000
Guinea-Bissau	-0.1142	0.3543	28	
Mali	-0.4225	0.4112	28	
Niger	-0.1917	0.1329	28	
Nigeria	0.7903	0.2225	28	
Senegal	0.2980	0.1997	28	
Sierra Leone	-0.5336	0.5246	28	**W10** = 7.7435 df (13, 378) Pr > F = 0.0000
Togo	-0.3291	0.1999	28	
Total	6.050e-16	0.4809	392	

Source: Compiled by Authors (2024).

The Pesaran (2004) test reported in Table 5 confirms that the panels or errors exhibit cross-sectional dependence (CSD). The Friedman (1937) test also validates that there are cross-correlations among the countries studied. The Frees' statistic of 4.705 is not significant, signalling the independence of the panels. The Pesaran and Friedman tests confirming strong CSD indicate that shocks in one country will spill to other ECOWAS countries, implying that the 14 ECOWAS countries are interconnected.

Table 5: Cross-sectional dependence test result

Test	Value	Prob.	Decision
Pesaran (2004)	13.985	0.0000	Dependence
Friedman	125.204	0.0000	Dependence
Frees	4.705	0.1204	Independence

Source: Compiled by Authors (2024).

With CSD present and the slope confirmed to be heterogenous, the study was confined to using the CIPS test to check for stability of concerned variables. Table 6 indicates that the mean and variance of GDP per capita, EDI, FD, FDI, INF, EXD and POP at level form are time-invariant, implying that the considered variables are stable and exhibit I(0) properties; but the level values of TPN, NRR and ECH possess non-stationary condition, only becoming stationary when first difference is taken.

Table 6: Panel Unit Root Result

Panel Unit Root Test				
CIPS Test				
Variables	Levels	1st Diff.	5% Critical value	Remark
$lny_{i,t}$	-2.402**	-	-2.25	I(0)
$edi_{i,t}$	-2.783***	-	-2.25	I(0)
$fd_{i,t}$	-2.571***	-	-2.25	I(0)
$tpn_{i,t}$	-1.932	-5.268***	-2.25	I(1)
$fdi_{i,t}$	-3.156***	-	-2.25	I(0)
$inf_{i,t}$	-4.324***	-	-2.25	I(0)
$exd_{i,t}$	-2.555***	-	-2.25	I(0)
$nrr_{i,t}$	-2.070	-5.382***	-2.25	I(1)
$lnech_{i,t}$	-1.303	-3.556***	-2.25	I(1)
$pop_{i,t}$	-2.629**	-	-2.25	I(0)

Note: *, ** and *** show confidence at 90%, 95% and 99% respectively.
Source: Compiled by Authors (2024).

The concern of this study is to examine the threshold effect of financial development on the export diversification-economic growth nexus. The theoretical notion is that export diversification fosters economic growth as it drives competition, opens new markets, promotes economies of scale, scales up productivity, improves foreign exchange earnings, builds up government revenue, and ensures maximum employment. However, these positives can be abrogated when the financial system is undeveloped. By providing trade credits and aiding its proper utilization, a well-developed financial system fosters economic growth by enhancing export growth and diversification.

Thus, the financial sector needs to be developed to a certain level for export diversification to induce economic growth. By applying the PTR model, the required degree of financial development can be ascertained. Before this, the study tests for threshold effect or nonlinearity using broad money as percentage of GDP (the variable served as proxy for FD) as threshold variable. The study obtained the outcome of the test and asymptotic p-value through 500 bootstrap iterations.

Table 7 presents an F-stat of 108.48 and the p-value for this is below 0.05, indicating that a single threshold for broad money exists, which is 24.7814% of GDP. The existence of a threshold in the regression is also indicated in Figure 1. Following this, the broad money data is split into two regimes – low and high financial development or broad money regimes.
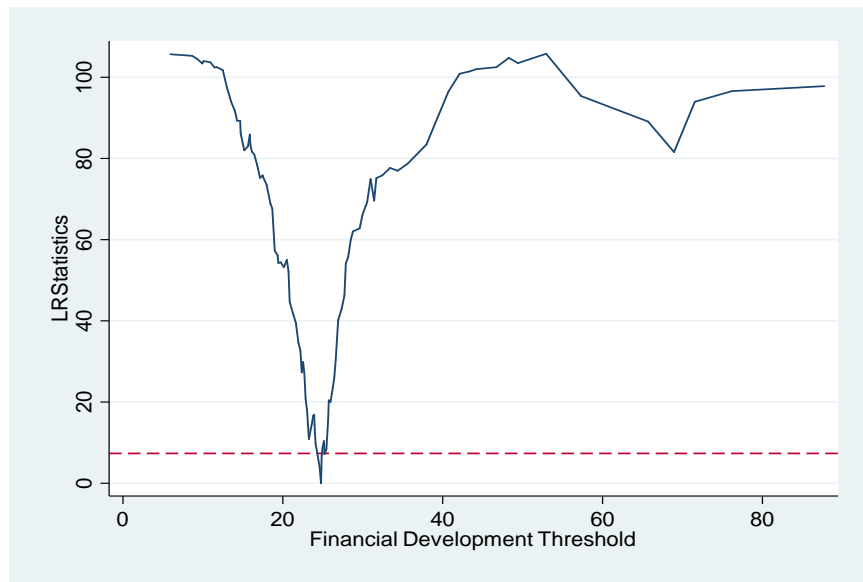
Threshold analysis

Figure 1: Confidence interval construction for Threshold

Table 7: PTR Analysis Result

Threshold level (π) [confidence limits]			24.7814 [24.3501, 24.8653]	
$Var.$	**$coef.$**	**$st.Err.$**	**t**	**$p > |t|$**
c	6.3949	0.2005	31.89	0.000
$tpn_{i,t}$	0.0006	0.0008	0.79	0.432
$fdi_{i,t}$	0.0087**	0.0033	2.60	0.010
$inf_{i,t}$	-0.0001	0.0013	-0.10	0.923
$exd_{i,t}$	-0.0006***	0.0002	-3.29	0.001
$nrr_{i,t}$	-0.0078***	0.0020	-3.80	0.000
$lnech_{i,t}$	0.0360***	0.0120	3.00	0.003
$pop_{i,t}$	-0.0467**	0.0210	-2.22	0.027
EDI Regimes				
$fd_{i,t} \leq \pi$	0.3242	0.2222	1.46	0.145
$fd_{i,t} > \pi$	0.6113***	0.2204	2.77	0.006
Threshold Test				
Threshold	RSS	MSE	F-stat	Prob.
Single	11.0927	0.0305	108.48	0.0080
Model Diagnostic				
Obs.			392	
Units			14	
R^2			0.4005	
F-stat[prob.]			27.39[0.000]	

Note: *, ** and *** show confidence at 90%, 95% and 99%, respectively.
Source: Compiled by Authors (2024).

Table 7 reveals that, in the first regime where financial development (broad money) is less than 24.7814% of GDP or the financial system of the ECOWAS countries is repressed or less-developed, export diversification enhances output growth, but not significantly. When broad money is below 24.7814% of GDP, export diversification promotes economic growth, as GDP per capita averages an increase of 0.3242% on the back of a 1% more diversified export basket. This indicates that, while a diversified structure of export can potentially cause the economies of the ECOWAS countries to expand, an environment where financial institutions are underdeveloped will

obviate export diversification from inducing positive economic performance in the region. Turning to the second regime when broad money is above the 24.7814% threshold level, Table 7 shows export diversification is positive and significantly promotes economic growth. The result indicates that a shift in the composition of the exports of the ECOWAS countries from homogenous products to more differential products potentially stimulate economic growth and engenders economic prosperity and performance, but only when the domestic financial institutions of the 14 ECOWAS countries are efficient and developed. Specifically, as the exports of the 14 ECOWAS countries become 1% more diversified, total output averagely expands by 0.6113%. This finding endorsed the results of Mazengia et al. (2023) and Harighi et al., (2023), which highlight that higher financial development incentivizes domestic investors to produce differential products and export same to other countries. It also emphasizes the findings of nonlinearity in the export diversification-growth relation underlined by Murphy-Braynen and Thurman (2019), Aditya and Acharyya (2013) and Yakubu et al. (2022).

As the economies of the ECOWAS countries become more open, Table 7 shows that the economies begin to orientate towards economic prosperity, as economic growth becomes catalyzed 0.0006% more as trade share of GDP increases by 1%. As can be observed, the TPN coefficient is insignificant. This result, which is completely at variance with the pro-economic growth submission of Denwi et al. (2022) and Zahonogo (2016), can be explained partly by the fragmented domestic markets, domestic obstacles to transport and trade in the form of unjustified border changes, thickness of borders, and the operation of unity commodity economy by some of the countries studied, fusing to limit competitiveness and reduce global integration.

Table 7 shows that the coefficient of FDI is consistent with the theoretical impact sign. For the ECOWAS countries, a 1% increase in FDI yields an output growth of 0.0087%. The increase in FDI upscales economic activities through capital accumulation, increasing competition, aiding technological transfer, and improving the level of human capital. In predicting economic growth, inflation has become an important factor in the process of economic growth. High inflation creates uncertainty and disincentivizes investment, slashes profits of firms and burns the pockets of households, harming economic growth as it scales back consumption and investment spending. As

depicted in Table 7, the inflation sign is negative and is consistent with theoretical notion, particularly the investment effect. Economic growth in the ECOWAS countries is expected to decelerate by an average of 0.0001% as commodity prices soar by 1%. Though consistent with the conventional theory, the drag-down effect of price increase is insignificant and reflects the money neutrality view propagated by the classicists, which portrays inflation as having little or no transmission effect on economic activities.

In addition, Table 7 shows that the growth of the 14 ECOWAS economies, which would have been fuelled by the catalytic agent of external debt, due to its reduced inflationary risks and lesser investment crowd-out effect, is rather repressed by accumulated external debt. Backing this statement is the negative sign and significance of the EXD variable. As seen in Table 7, a 1% rise in external debt weakens economic growth by 0.0006%. Table 7 reveals that the 14 ECOWAS countries cannot grow their way to a higher income level using natural resource rents. Precisely, the significance of the negative sign of the predictive variable NRR indicates that the large storehouse of natural resources of the ECOWAS countries is a curse, as rents from their exploration impose a growth-hampering effect. Real income reduces by 0.0078% as rent from explorative activities in the extractive sector increases by 1%. The importance of parrying away reliance on the extractive sector is emphasized and acknowledged by this study.

Through Hansen's (1999) panel threshold regression model, exchange rate depreciation is seen as a beneficial factor for reflating the economies of the 14 ECOWAS countries, possibly doing so through the export channel. By conferring a price advantage on the currency-depreciating country, trade is expected to increase in volume. Table 7 reveals that a 1% increase in exchange rate stimulates economic growth by 0.0360%. It is evident from Table 7 that population does not provide an impetus for output expansion in the ECOWAS countries. The study shows that a population growth of 1% causes a downward shift in output level by 0.0467%. While Asongu (2015) contends that population growth influences economic growth via investment, through the effect of propensity to consume, labour supply, and composition of total consumer demand, what is emphasized more in the growth process is the quality of the population and participation rate of labour. The young pool of labour in the ECOWAS countries is inadequately skilled and there is low

work involvement, explaining partly why output level is repressed by growing population.

5. Conclusion and Recommendations

The turbulent global economic landscape, geopolitical tensions, financial upheavals, and possible outbreak of a pandemic reinforce the need for countries to diversify their economies in order to be competitive and achieve sustainable economic growth. Export diversification can function as a catalytic agent and strategic engine in this economic growth process. The ECOWAS countries are heavily reliant on natural resource earnings and being economies with large storehouses of natural resources, they remain prone to a multiplicity of external shocks. Therefore, a prime economic growth strategy will be to build an economy that is non-resource based through promoting export diversification. Access to credit facilities is crucial for export diversification due to the upfront fixed costs and credit constraints associated with product diversification, designing, marketing and distribution of such products. Amid this connection, this study investigated whether a well-developed financial system is a vital prerequisite for export diversification to propel economic growth in the ECOWAS region. This was explored for 14 ECOWAS countries by applying Hansen's (1999) panel threshold regression model.

The econometric study provided invaluable insights. First, the investigation discloses that the role of export diversification in promoting economic growth is more pronounced when the financial system is developed. Notably, the ECOWAS countries can diversify their exports to a higher income level when broad money exceeds 24.7814% of GDP. Second, the study finds that higher FDI inflows and currency depreciation promote economic growth. Third, the study observes that a decline in economic growth is fed by a higher external debt burden and natural resource rents.

The empirical results have certain policy implications. First, to facilitate export diversification, the central banks of the countries studied should undertake policies to develop their financial system through adjusting lending and deposit rates. This will foster more savings to ensure capital is mobilized to exporting firms. Second, credits allocation should be prioritized to the real sector, while dissuading its concentration in a particular sector. Third, to

ensure and guarantee export diversification, lending rates should be lowered to bring demand for and supply of credit to equilibrium.

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