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Export Diversification, Financial Sector Development and Economic Growth: Empirical Evidence from West African Sub-Region

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Abstract: In this study, we explored the influence of trade diversification and financial sector development on economic growth of ten West African countries for the period 2007 to 2020. The study employed the panel autoregressive distributed lag (ARDL) model since some of the variables were stationary at level while others were stationary at first difference, fully modified ordinary least squares approach of estimation, and Granger causality test. The findings of the study from the ARDL model indicated that export diversification exerts a negative effect on economic growth both in the short-run and in the long-run, though such effect were insignificant. The effect of financial sector development on growth is observed to be positive and significant in the short-run, and negative and significant in the long-run. From the robustness check, the FMOLS result indicated that export diversification exerted a negative and significant effect on growth; while the effect of financial development is positive but insignificant. The Granger causality test revealed that a unidirectional causality flow between export diversification and economic growth, with the former causing the latter. The implication of this findings is that countries within the West African region should specialize in some export products in order to boost efficiency in production and the resultant effect on greater export and export earnings.

Keywords: Immiserizing Growth, Export Diversification, Financial Sector Development, Prebisch-Singer Hypothesis.

1. Introduction

Export diversification simply entails altering the content and structure of a nation's exports, and this may be done by either changing the export commodity pattern as it is, or by applying more innovation and technology to it (Dennis & Shepherd, 2009). In general terms, its entails a diversified export structure (Al-Marhubi, 2000); "product diversification from a product viewpoint and product diversification from a geographic standpoint" (Ali, Alwang, & Siegel, 1991); and "the coverage of exports over assorted products and trading associates" (Osakwe & Kilolo, 2018). By product diversification, export diversification entails "the modification in export structures by broadening the

export coverage; growing export revenue by incorporating technology and innovation" (Osakwe & Kilolo, 2018); while for geographic export diversification, it entails broadening the variety of destinations for exports products (Hill et al., 1992).

Export diversification is a phenomenon that has been recognized as a key instrument for fast-tracking economic growth in emerging nations. The Prebisch-Singer hypothesis criticized prior theories of international trade that Adam Smith, David Ricardo, Neoclassical Economics, and model of international trade as enunciated by Heckscher-Ohlin (H-O), and Samuelson underscored on export specialization by maintaining that "export specialization increases the reliance of LDCs on the exporting of primary products and the import of consumer and manufacturing products from advanced economies (Sarin et al., 2020).

The literature has provided evidence that by diversifying the export mix, the risk of commodity shocks, price instabilities, and trade terms may be decreased and the pace of economic expansion can be further sped up. It has been controversial to decide whether emerging economies should specialize in exports or diversify their exports. The H-O theory placed emphasis on the need for an economy to specialize in the production and export of commodities for which it has a competitive advantage because of differences in the factor intensities of those goods (Salvatore, 2009). The model is particularly concerned with the relationship concerning factor endowment and product trade nature plus the effects of free trade on the factor distribution of income among the nations. Furthermore, it argues that nations should concentrate on exporting goods for whose manufacturing they need relatively abundant production inputs. The Prebisch-Singer theory supports export diversification in this situation since export specialization will promote reliance in emerging nations.

Additionally, the H-O model is contested under the guise of unchanging technology due to the imitation lag hypothesis (Posner, 1961), which exposed the gap in technology that differs between nations and affects their ability to trade. Even new product consumption is not divided equally among the nations, which motivates these nations to adopt technology. Therefore, innovation is the only way for these nations to be successful in export. The product life cycle (PLC) hypothesis, which contends that export diversification is a necessary component of economic growth and that it can only be expanded by ongoing product development, is another argument in favour of the notion. Furthermore, according to theory, the product must go through three unique stages before it can be standardized: the new product stage, the maturing stage, and the final stage.

No international trade occurs when a new product is being developed since there is only domestic demand, and businesses even want to interact with domestic customers to gauge their opinion of the product (Ederington & Mc Calman, 2009). It is during this stage of development that demand for the new product begins to come from overseas markets, the producer begins to produce for these markets, and foreign trade begins to grow (Audretsch et al., 2017). During the standardized stage, production begins to shift to developing economies. Recent growth model theories (Aghion et al., 2014; Aghion & Howitt, 1998) have provided the theoretical justification for export diversification and upheld that

more export diversity has a favourable effect on the economy's ability to accumulate human capital. Additionally, according to new growth models, access to foreign inputs increases productivity and lowers the cost of innovation, leading to a diversity of products. For example, developing countries may be able to fight export volatility or the negative consequences of trade circumstances for primary goods by diversifying their exports (Hesse, 2008).

The status of export diversification within the West African sub-region can be studied in terms of the export diversification index. This index is varying within 0 to 1, with higher values portraying a greater level of diversification. Figure 1captures the value of export diversification within the West Africa as at 2021.

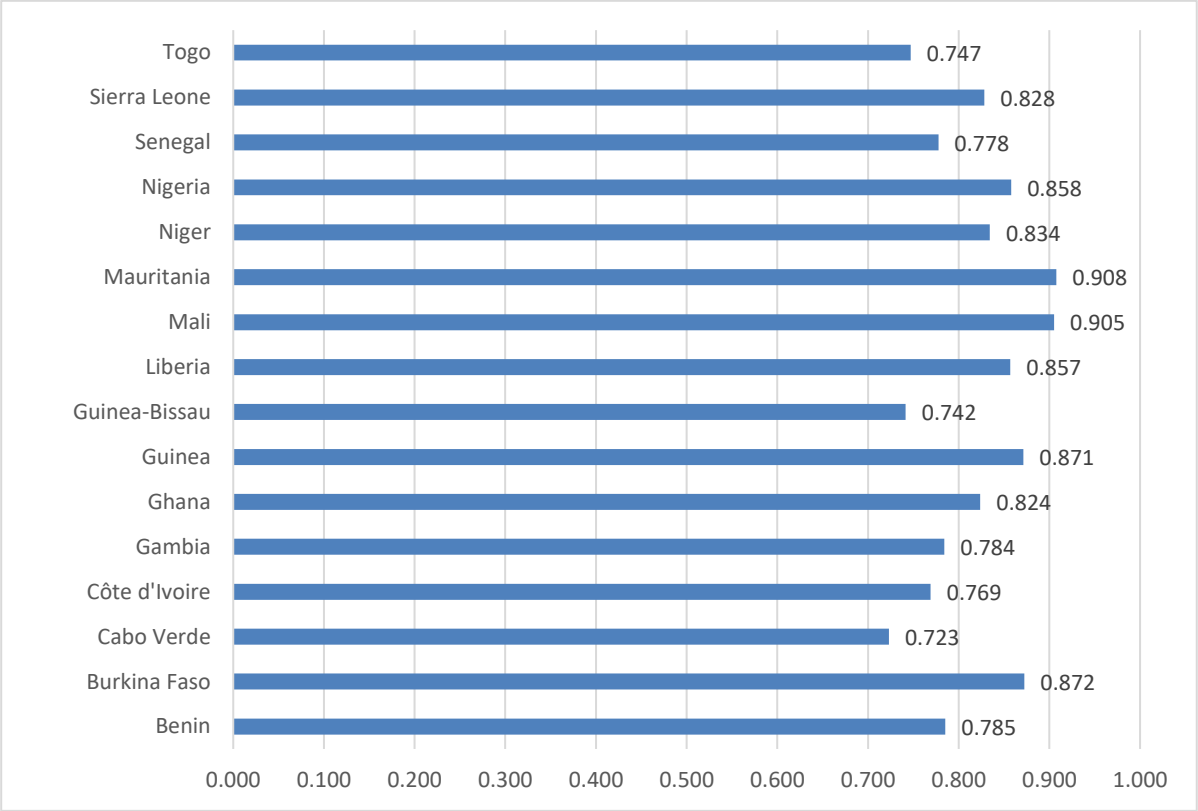

Figure 1. Export Diversification Index, 2021

Consistent with Figure 1, it is clear that the selected West African countries, Mauritania maintained a greater level of export diversification as could be seen from the export diversification index of 0.908. This is followed by Mali with 0.905; Burkina Faso with 0.872; Guinea with 0.871; Nigeria with 0.858; and Liberia with an export diversification index of 0.857.

Within the Sub-Saharan Africa, export diversification index has been exhibiting a declining trend from 2007 and reaching its base 0.570 in 2012. Afterwards, an upward trend was recorded, reaching 0.603 and 0.630 in 2019 and 2021 respectively. Figure 2 captures the trend in the variable over the years.

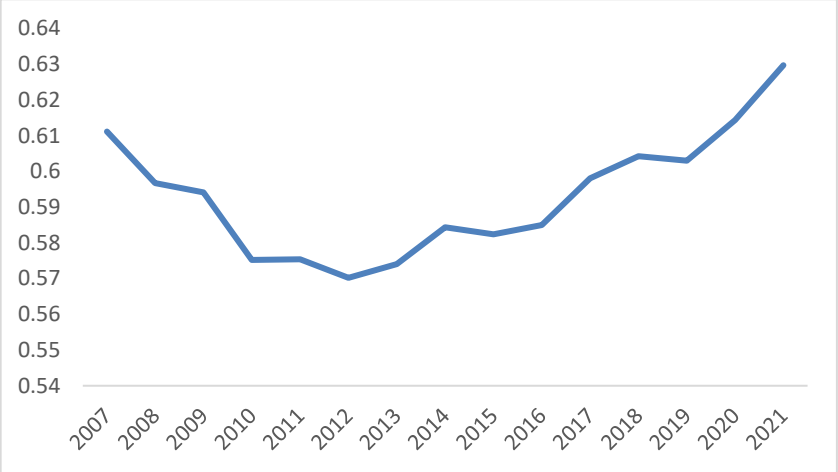

Figure 2. Trend of Export Diversification Index for Sub-Saharan Africa

For the West African Sub-region, Figure 3 captures the trend of export diversification over the years.

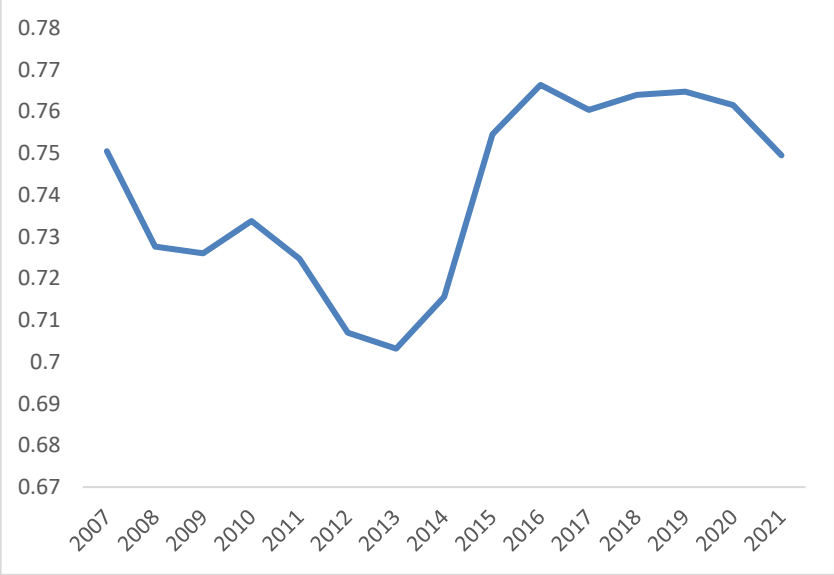

Figure 3. Trend of Export Diversification Index for Western Africa

As could be observed from Figure 3, export diversification index within the West Africa declined from 0.750 in 2007 to 0.703 in 2013; after which a rising trend set in as it increased to 0.754 and 0.766 in 2015 and 2016 respectively. Afterwards, a declining trend set in as the index moved to 0.762 and then to 0.749 in 2020 and 2021 respectively.

Going by the number of export products, Figure 4 showcases the number of export products across countries within the West African Sub-region.

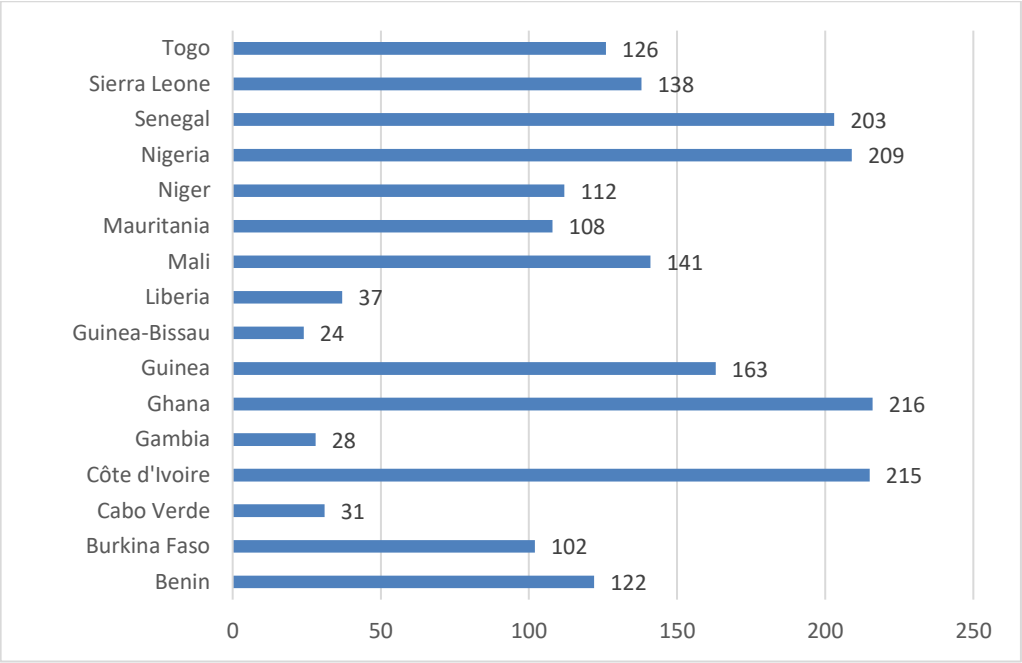

Figure 4. Number of Export Products, 2021.

In line with Figure 4, Ghana has the highest number of export products of 216 as at 2021 followed by Cote d'Ivoire with 215 and Nigeria with 209 export products. As at 2021, the total number of export products in Western Africa was 250 compared to 249 in 2020 which is merely a one-unit increase (UNCTAD, 2021).

It is worth noting that the ability to diversify export depends on the ability to boost the production of such export products within the economy. Consequently, the role of the financial system comes in to play. As could be observed, recent trends in export diversification within the West African Sub-Region is a declining one, which calls for adequate attention. A well-developed financial system will aid in the provision of finance to boost the production of export goods, which will boost export diversification and growth. In this light, this study therefore seeks to examine the influence of export diversification and financial sector development on the economic growth of West African countries between 2007 and 2020; and to ascertain the nature of causal linkages concerning export diversification and economic growth in West Africa. The study focuses on ten West African countries which are Benin, Cabo Verde, Côte d'Ivoire, Gambia, Ghana, Mauritania, Nigeria, Senegal, Sierra Leone, and Togo. An investigation into this is crucial as the outcome of this study will help policymakers on imminent export diversification plan of the State and will also divulge if the West African region is on the path of sustainable growth.

2. Literature review

In the literature, the gains from trade based on the traditional literature has been linked to specialization based on comparative advantage as being a pathway to achieve economies of scale, which is potent in driving economic growth. The 'level' at which trade affect income has been the major concern in the

literature since open economies benefits from high level of income compared to closed economies, but the 'rate' at which trade affects income in an open economy compared to a closed economy has not been evaluated (Grossman & Helpman, 1990). Meanwhile, some studies had showcased the pathway through which export could influence growth, with emphasis being placed on export diversification. Export earnings' instability has been pointed out as being the link concerning economic growth and export diversification. As argued by Trinh and Thuy (2021), an addition of new products to the prevailing export bundle can diminish earnings reliance on a restricted number of export goods which are prone to price volatility.

Further argument has been put forth which align to the fact that greater export concentration in regards to export bundle and markets generates greater short-term instability in national income; as developing nations tends to get highly stable export earnings by involving in a wide array of export goods and export markets (Dennis & Shepherd, 2009). It follows from this line of argument that countries involved in greater diversification of export can recompense for income shortfalls from highly gainful or somewhat unwavering sectors; and by incorporating extra markets to the existing ones, a nation can reduce the dependence of export yields on the condition of a minor diversified market (Trinh and Thuy, 2021). Studies have empirically proven that export product concentration cum the acuteness of trade crumple in the midst of crisis are positively related (see Romeu & Costa Neto, 2011; Karahan, 2017). Also, economies with greater export concentration possesses a highly unstable real currency rate which is detrimental to investment in products and services (World Bank, 1987); and in sum, export diversification associates in a positive manner with income growth.

Another way to explore the theoretical basis of the link between trade diversification and economic growth can be viewed with respect to immiserizing growth. Immiserizing growth is a long-run event that ensues when a country's gain in social welfare consequent upon economic growth is highly offset by a loss in such welfare due to a negative shift in trade terms (Pryor, 2007). Immiserizing growth happens in a developing nation that has begun economic growth but faces unfavourable international demand circumstances as it boosts its conventional exports (Bhagwati, 1958; 2008). In another scenario studied by Paul A. Samuelson, immiserizing growth happens for the expanding industrialized nation when its trading partner pursues an import substitution growth policy, shifting the terms of trade against the exporting country (Pryor, 2007).

In line with the notion of immiserizing growth, economic growth countered by decreasing trade terms can exacerbate a country's situation. Developing countries become trapped in this predicament when they focus on the exportation of raw materials at a lower price relative to manufactured items (Trinh and Thuy, 2021). Sustained growth requires developing nations to diversify their exports from basic products to manufactured goods, as suggested by the term "vertical diversification." In likewise manner, Prebisch (1950) and Sachs & Waner (1995) noted that the 'natural resource curse' argument suggests that a substantial percentage of exports of natural resource over GDP might impair trade terms, cause unnecessary instability, and lead to low growth in productivity. Cadot et al. (2013) provide three

supporting grounds for this idea: (i) when the relative price of basic items falls, nations that rely heavily on commodities suffer from decreasing exports; (ii) due to unstable trade terms, the preponderance of primary items in the export basket is a component of growth-constraining instability; and (iii) focusing on basic commodities reduces productivity since primary commodities are typically laggards (Trinh and Thuy, 2021).

Critical area that has also attracted attention in the literature is about comparing specialization and export diversification. To Chenery (1979), his attention was on the conflict between trade theory concerned with 'comparative advantage' and growth theory that ignores it. Grossman & Helpman (1990) channelled his concerns towards comparative advantage and long-term growth by emphasizing on the acquisition of comparative advantage. Broadening comparative advantage has been tagged the chief driver of economic growth (Agosin, 2009).

Another theoretical basis that is worth examining is the endogenous growth theory. Based on this theory, product variety for export (export diversification) is regarded as one of the sources of economic growth. This is because export diversification aids unceasing economic growth through knowledge externalities such as 'learning by doing' cum 'learning by exporting' (Trinh & Thuy, 2021). Utilizing innovative technologies is part of export diversification (Trinh & Thuy, 2021). The phrase "learning by doing" earlier mentioned refers to how the externalities from export areas spread to other segments of the economy. Diversified exporters' acquisition of business skills will expand to other regions. These aid in capital accumulation and act as growth-promoting factors. To Herzer & Nowak-Lehnmann (2006), 'learning by exporting' refers to the export area's acquisition of experience from overseas as overseas importers transmit their technological know-how for increased production. The spillover effects described above are explained by the product cycle theory (Vernon, 1966). A 'product's life cycle' presents openings for an importing nation to start exporting that commodity. Although this product would not be entirely novel globally, it may have the knowledge spillover effects earlier mentioned for this nation.

The literature discussed above supports the desirable export diversification' effects on growth. However, gains from diversifying export base cannot be achieved devoid of taking into account comparative advantage (Cadot et al., 2013). Initial phases of diversification must be linked to the most successful export product base to promote economic growth. Higher levels of diversity will, in part, entail less efficient items without a competitive edge or new markets where the present products lack an advantage. Consequently, export diversification at this level does not provide a source for economic growth, unlike the early phases.

Several empirical works have been conducted on the link concerning export diversification and economic growth. with the use of panel data from 42 Sub-Saharan Africa (SSA) nations, Hodey, Oduro, & Senadza (2015) offered evidence on the association oncerning export diversification (ED) and economic growth. (EG) Three alternative metrics of diversification, together with the system Generalized Method of Moments (GMM) estimation approach, were used in the study. The results,

however, refute the hypothesis that ED and EG in SSA are correlated in a hump-shaped (non-linear) manner.

Chia (2016) studied the pertinence of the export-led growth hypothesis (ELG) in SSA nations from 1985 to 2014. The panel data analysis techniques were used, including dynamic ordinary least squares (DOLS), fully modified OLS (FMOLS), and panel unit root. Investments, government expenditure, and exports all have a favourable effect on economic growth, according to estimates from FMOLS and DOLS. The outcomes therefore shown the feasibility of an export-oriented economic strategy in sub-Saharan African nations.

Nwosa, Tosin & Ikechukwu (2019) investigated the concerning ED and EG in Nigeria between 1962 and 2016. The Auto-regressive Distributed Lag (ARDL) approach was used in the investigation. According to the findings of the study, ED has a favourable but negligible impact on Nigeria's EG. The following result shows that the oil industry continues to dominate the Nigerian economy, despite the government's attempts in diversify the economy. As a result, the study advocates for deliberate economic policies that support the diversification of the whole non-oil sector of the economy.

Using the FMOLS approach, Malick (2019) determined the determining elements for the diversification of exports in the WAEMU nations between 1995 and 2015. The findings indicate that the primary explanatory elements for the diversification of exports in the WAEMU nations are trade openness, the build-up of human cum physical capital, a viable real currency rate, and natural resources endowment.

In the Economic Community of Central African States (ECCAS), from 2000 to 2016, Ngassam et al. (2020) studied the power of infrastructure on export diversification. As indices, total export diversification and its extensive and intensive margins were considered. The FMOLS and DOLS estimators are utilized. According to the empirical findings, infrastructure for mobile phones and power both favourably and significantly contribute to the diversification of exports as a whole. Internet and transportation infrastructure, however, have the opposite effect.

The Southern African Development Community (SADC) member nations' export diversification between 1990 and 2018 was explained by a number of variables by Espoir (2020). The Herfindahl-Hirschman (H-H) index, used in the study to quantify export diversification, was regressed on a set of explanatory factors with the aid of FMOLS and DOLS. The findings demonstrate that there is a long-term connection concerning the diversification of exports and the GDP per capita. Other key variables were openness liberalization, buildup of human cum physical capital, and foreign direct investment.

In 44 emerging markets and developing nations, Trinh & Thuy (2021) looked at the nonlinear link between export diversification and economic growth. Data for the years 1995 to 2015 were analyzed using the threshold regression approach. The H-H market concentration index and Theil index, are used to assess ED in terms of both region and product. The findings showed that ED and EG had a nonlinear connection. When export markets and goods are diverse, economic growth is boosted. The

positive correlation between market and product diversification and growth is negligible below the threshold.

Matezo et al. (2021) investigated the impact of export diversification on economic growth in 15 SADC nations from 1998 through 2018. To produce reasonable approximations of the influence of export diversification on economic growth, the GMM approach was used. The findings indicate that ED index have a direct and substantial impact on economic growth.

Vogel (2022) presents empirical evidence on the causes of export diversification and using Bayesian Model Averaging (BMA) to address model ambiguity caused by the large number of probable factors. From 1995 to 2018, the report evaluates the weight and effect of 46 driving forces of export diversification for 47 African nations and 123 trade partners. According to the findings, exporter, importer, and bilateral features are major drivers. Notably, the structural characteristics and trade policies of African nations have a substantial impact on diversification. The investigation also demonstrates that the features of the trade partner can influence diversification patterns.

While some studies show a direct monotonic rapport concerning export diversification and economic growth (Al-Marhubi, 2000; Herzer & Nowak-Lehman, 2006; Agosin 2007; Lederman & Maloney, 2007; Hodey et al. 2015; Nwosa et al., 2019; Trinh & Thuy, 2021), others show a non-monotonic (hump-shaped) rapport. Further research is needed due to the apparent mixed findings in the empirical literature about the nature of the association amid export diversification and growth. The literature on the link between export diversification and growth in West Africa is relatively limited.

3. Methodology

This study utilizes panel regression analysis to explore the influence of export diversification and financial development on economic growth of ten West African countries from 2007 to 2020. The choice of the countries and period of analysis is due to the availability of data on key variables in the model. The countries so selected are Benin, Cabo Verde, Côte d'Ivoire, Gambia, Ghana, Mauritania, Nigeria, Senegal, Sierra Leone, and Togo. Based on the objective of the study, the model is built by adapting the model of Trinh and Thuy (2021). The model is specified in line with the endogenous growth theory as follows:

$$ECGT_{i,t} = \alpha_i + \beta_1 GFCF_{i,t} + \beta_2 LABF_{i,t} + \beta_3 EXPD_{i,t} + \beta_4 FDI_{i,t} + \beta_5 FDV_{i,t} + \beta_6 INF_{i,t} + \mu_{i,t} \quad (1)$$

In which the subscript *i* represents the countries (*i* = 1, 2, …, 10) and the *t* characterizes time, the error term $\mu_{i,t}$ is assumed to be normally distributed with a zero mean and constant variance ($\mu \sim N(0, \delta^2)$, α_i is the intercept, and $\beta_1 - \beta_6$ are the partial slope coefficients.

In line with Equation (1), ECGT signifies economic growth (the dependent variable) which is quantified by the growth rate of real gross domestic product. The independent variables on the right-hand side are physical capital (GFCF) measured as the ratio of gross fixed capital formation to GDP;

labour force (LABF) measured as the growth rate of working population; export diversification (EXPD) measured as export diversification index; foreign direct investment (FDI) measured as the ratio of foreign direct investment net inflows to GDP; financial sector development (FDV) measured as the ratio of broad money supply to GDP; and inflation rate (INF) measured as consumer price index. Given the need to explore the stationarity properties of the variables, this study utilizes the panel unit root test approach based on Im, Pesaran and Shin (IPS) (2003) and Levin, Lin & Chu (LLC) (2002) approaches. The IPS panel unit root test is utilized to ascertain the individual unit root test, while the LLC is used for common unit root test. The test equation is specified as follows:

$$\Delta Y_{i,t} = \emptyset_i + \beta_1 Y_{i,t-1} + \delta t + \sum_{q=1}^{m} \gamma_i Y_{t-q} + \varepsilon_{i,t} \qquad (2)$$

Where the equation is specified based on the constant and deterministic time trend assumption. In Equation (2), Y represents the time series variable to be tested for unit root, and the null hypothesis states that "Y has a unit root". That is, the null hypothesis to be tested is that $\beta_1 = 1$ against the alternative hypothesis that $\beta_1 < 1$.

Given that the study utilizes the autoregressive distributed lag (ARDL) approach in the analysis of the first objective, the model is specified as:

$$\begin{aligned}\Delta ECGT_{i,t} = \beta_i &+ \sum_{q=1}^{m} \varphi_1 ECGT_{i,t-q} + \sum_{q=1}^{m} \varphi_2 \Delta GFCF_{i,t-q} + \sum_{q=1}^{m} \varphi_3 \Delta LABF_{i,t-q} + \sum_{q=1}^{m} \varphi_4 \Delta EXPD_{i,t-q} \\ &+ \sum_{q=1}^{m} \varphi_5 \Delta FDI_{i,t-q} + \sum_{q=1}^{m} \varphi_6 FDV_{i,t-q} + \sum_{q=1}^{m} \varphi_7 INF_{i,t-q} + \gamma ECM_{t-1} \\ &+ \mu_{i,t} \qquad (3)\end{aligned}$$

Equation (3) is an ARDL model with variables being as earlier defined. The coefficient of ECM (γ), is the error correction mechanism which measures how the short-run distortions is adjusted for equilibrium to be achieved in the long-run is expected to be negative and statistically significant; Δ is the difference operator, *m* is the optimal lag length, and φ_s' are the short-run parameters.

Also, the pairwise Granger causality test is also deployed in the study to examine the nature of the causal relationship between export diversification, financial sector development and economic growth in West Africa. The model is specified as:

$$ECGT_{i,t} = \theta_i + \sum_{q=1}^{m} \beta_1 ECGT_{i,t-q} + \sum_{q=1}^{m} \beta_2 EXPD_{i,t-q} + \varepsilon_{i,t} \qquad (4)$$

$$EXPD_{i,t} = \theta_i + \sum_{q=1}^{m} \pi_1 ECGT_{i,t-q} + \sum_{q=1}^{m} \pi_2 EXPD_{i,t-q} + \varepsilon_{i,t} \qquad (5)$$

$$ECGT_{i,t} = \theta_i + \sum_{q=1}^{m} \rho_1 ECGT_{i,t-q} + \sum_{q=1}^{m} \rho_2 FDV_{i,t-q} + \varepsilon_{i,t} \qquad (6)$$

$$FDV_{i,t} = \theta_i + \sum_{q=1}^{m} \sigma_1 ECGT_{i,t-q} + \sum_{q=1}^{m} \sigma_2 FDV_{i,t-q} + \varepsilon_{i,t} \quad (7)$$

$$EXPD_{i,t} = \theta_i + \sum_{q=1}^{m} \omega_1 EXPD_{i,t-q} + \sum_{q=1}^{m} \omega_2 FDV_{i,t-q} + \varepsilon_{i,t} \quad (8)$$

$$FDV_{i,t} = \theta_i + \sum_{q=1}^{m} \tau_1 EXPD_{i,t-q} + \sum_{q=1}^{m} \tau_2 FDV_{i,t-q} + \varepsilon_{i,t} \quad (9)$$

Equation (4) and Equation (5), Equation (6) and Equation (7), and Equation (8) and Equation (9) are treated in a pairwise manner. The estimation generates F-statistics which are tested for their respective significance. The significance of the F-statistic is a proof for the rejection of the null hypothesis of "no causal relationship". The test result can generate different scenarios. These are:

(i) Unidirectional causality: Here, one variable causes the other only. For instance, if ECGT causes EXPD or if EXPD causes ECGT only. In this case, we say that there is a unidirectional causality flowing from economic growth to export diversification; or a unidirectional causality flowing from export diversification to economic growth.

(ii) Bidirectional causality: In this case, the two variables cause each other. Thus, we could say that ECGT causes EXPD and EXPD also causes economic growth at the same time.

(iii) No causality: Here no causal relationship exists and the two variables do not cause each other.

The data for the study are secondary in nature which are gotten from the World Development Indicators (WDI) and the United Nations Conference on Trade and Development (UNCTAD). Apart from data on export diversification which was gotten from the UNCTAD database, all other variables were obtained from the WDI. All the data covers the period of 2007 to 2020 and cuts across ten cross-sections, thus giving a total of 140 observations. The data were analysed using the Eviews software package.

4. Empirical Findings

4.1. Trend Analysis

The trend analysis is conducted based on economic growth (growth rate of GDP), export concentration index, export diversification index, and the number of export products.

4.1.1 Trend of Economic Growth

The growth rate of aggregate output in the selected economies has witnessed both periods of positive and negative growth. This growth pattern is reflected in Figure 5 for all the selected economies.

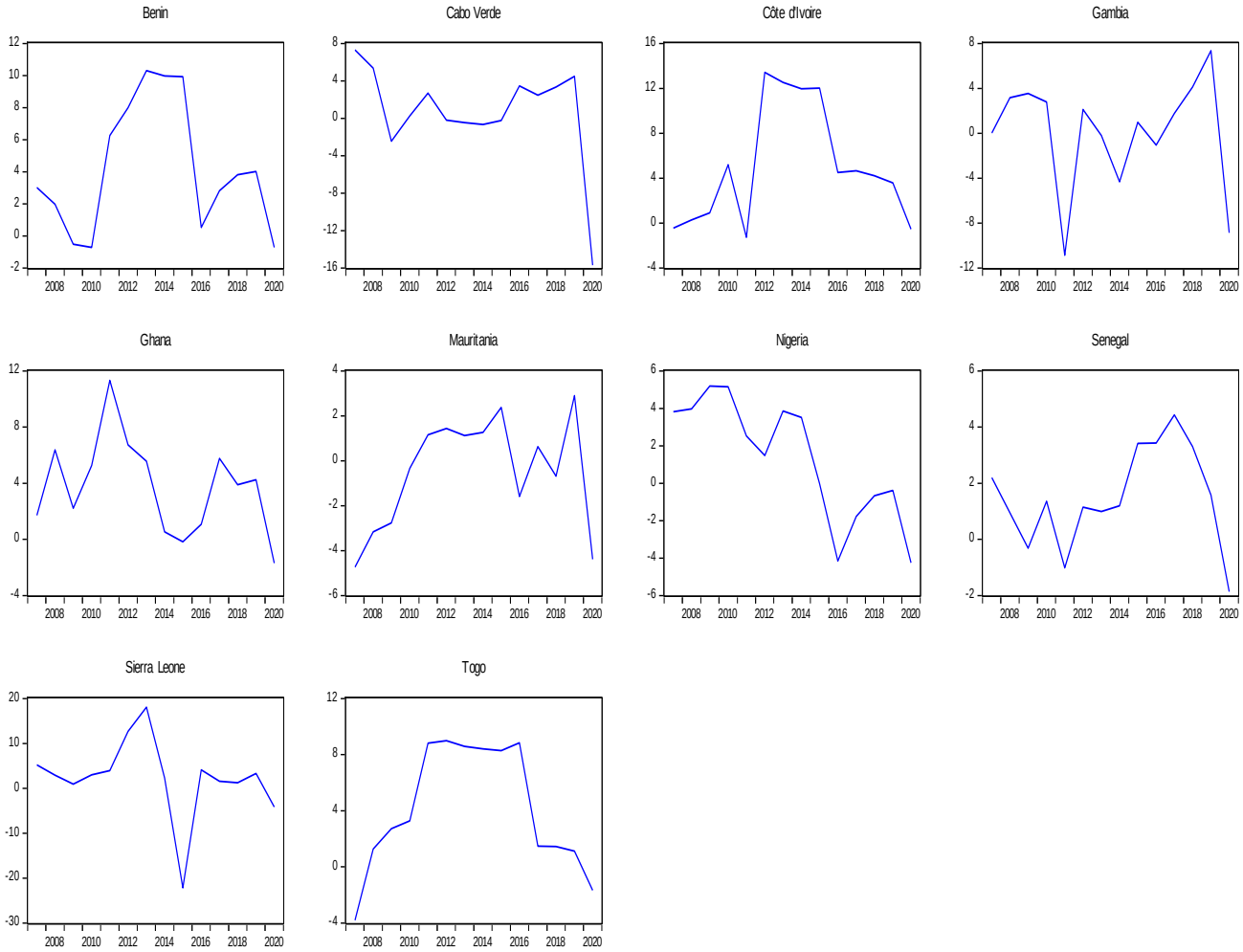

Figure 5. The trend of GDP growth for selected countries in West Africa

The trends reflect a common trend for the ten economies as they all exhibit a decline as at 2020, though with Cote d'Ivoire, Gambia, Mauritania, and Senegal depicting a sharp decline when compared to other countries in the panel. This sudden decline in the performance of these economies could be attributed to the impact of the Covid-19 pandemic on the economy as it exerted a dampening effect on production.

4.1.2 Export Diversification Index

The diversification of export goods is crucial in gaining diverse source of foreign exchange. It is expected that as the country's exportable goods increases, economic growth will definitely increase. The export concentration index is used to measure how diverse the export bundle of a country is. For the selected countries in this study, Figure 4 captures the trend in the export diversification index over the years.

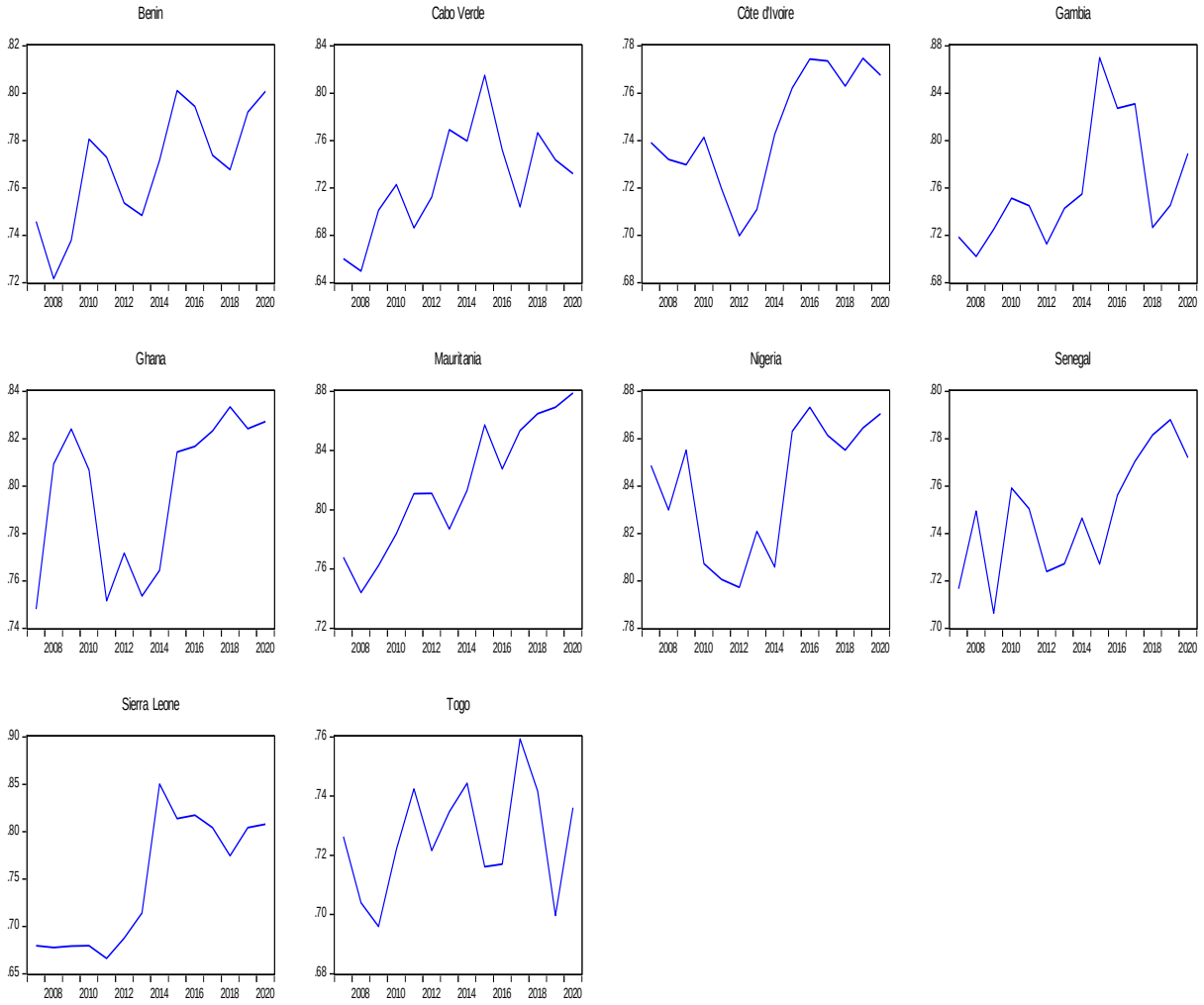

Figure 6. Trend of export diversification index for selected countries in West Africa.

The export diversification index for the selected countries based on Figure 6 indicates that there has been a fluctuating trend in the index over the years. The export diversification index for Benin Republic has been growing in a zig-zag manner with recent trend portraying an increasing volume of export commodities. Cabo Verde exhibits a highly fluctuating trend over the years with recent data indicating a declining diversification index. For Cote d'Ivoire, there has been a declining trend up to 2012 then a sharp increase set in up till 2018 before a slight fluctuation set in in 2019 and 2020. The index was quite unstable in the early 2000s for Gambia and then reached its peak in 2016 before a sharp decline emerged. thereafter, a declining trend was observed till 2018 after which a slight increase emanated. Ghana's export diversification index tends to be on the increase in the early 2000s up to 2009 after which a sharp decline set in. The index tends to stagnate between 2011 and 2013 after which a sharp increase was recorded till 2020 though with slight fluctuations. Mauritania is noted with its continuous rising trend in its export diversification index and it is the only country recording an export diversification index of 0.8789 among the selected countries in this study. The index is quite volatile for Nigeria, Senegal and Togo. Though Nigeria and Togo exhibited an increasing trend as at 2020, Senegal showcased a declining trend.

4.2 Descriptive Statistics

It is evident from Table 1 that the average economic growth for the selected countries within the West African region is 2.249% with a standard deviation of 4.979%, and having a minimum of -22.207% and a maximum value of 18.053%. The distribution tends to concentrate on the left-tail given the negative skewness coefficient of -0.762 and it is leptokurtic. The average export diversification index is 0.767 with a standard deviation of 0.052, and having a maximum and minimum value of 0.879 and 0.650 respectively.

Table 1. Descriptive Properties of the variables

	ECGT	EXPD	FDI	FDV	GFCF	INF	LABF
Mean	2.249	0.767	4.487	35.298	23.640	5.296	2.291
Median	2.151	0.762	3.096	27.852	21.083	4.333	2.571
Maximum	18.053	0.879	32.301	125.300	50.797	19.247	4.980
Minimum	-22.207	0.650	-11.199	15.671	9.112	-2.248	-5.980
Std. Dev.	4.979	0.052	4.747	20.859	9.408	4.964	1.259
Skewness	-0.762	0.203	2.026	2.339	1.001	0.886	-3.575
Kurtosis	7.957	2.382	12.246	7.965	3.461	2.987	21.157
Jarque-Bera	156.892	3.194	594.517	271.403	24.624	18.297	2221.280
Probability	0.000	0.203	0.000	0.000	0.000	0.000	0.000
Observations	140	140	140	140	140	140	140

Source: Researchers' Computation (2023).

4.3 Correlation Analysis

The correlation matrix in Table 2 reflects that export diversification correlates negatively with economic growth.

Table 2. Correlation matrix

	ECGT	EXPD	FDI	FDV	GFCF	INF	LABF
ECGT	1						
EXPD	-0.238	1					
FDI	0.042	-0.122	1				
FDV	-0.133	-0.247	0.143	1			
GFCF	-0.138	-0.071	0.331	0.589	1		
INF	-0.085	0.355	0.165	-0.349	-0.313	1	
LABF	0.197	0.058	-0.080	-0.249	-0.159	-0.025	1

Source: Researchers' Computation (2023).

This portrays that as this variable declines, economic growth is on a rising trend. Meanwhile, foreign direct investment and labour force correlates positively with economic growth. However, financial sector development, capital-output ratio, and inflation correlates negatively with economic growth. It can be observed that the correlations so observed are weak. In the same vein, such weak correlations do not imply any causation as such, a more in-depth analysis will be conducted using regression analysis to ascertain the cause-effect relationship.

4.4 Unit Root Test

The unit root test analysis is conducted to ascertain the stationarity property of the variables in the model. The test follows a panel unit root test for both individual unit root test based on Im, Pesaran and Shin (IPS) and common unit root test based on Levin, Lin and Chu (LLC). Table 3 presents the result of the test under the individual constant and individual trend assumption.

Table 3. Unit root test result based on individual effect and individual trend

Individual Unit Root Test				Common Unit Root Test		
Variable	Im, Pesaran and Shin W-stat at Level	Im, Pesaran & Shin W-stat at Level at First Difference	Order of Integration	Levin, Lin & Chu t* at Level	Levin, Lin & Chu t* at First Difference	Order of Integration
ECGT	0.29482 (0.6159)	-1.71492 (0.0122)**	I(1)	-1.13704 (0.1278)	-2.53733 (0.0056)**	I(1)
GFCF	-0.65650 (0.2558)	-2.49304 (0.0063)**	I(1)	-4.01042 (0.0000)**	----------	I(0)
LABF	0.53243 (0.7028)	-6.70718 (0.0000)**	I(1)	2.88957 (0.9981)	-6.29015 (0.0000)**	I(1)
EXPD	-2.88253 (0.0020)**	----------	I(0)	-6.39573 (0.0000)**	----------	I(0)
FDI	0.21481 (0.5850)	-2.12447 (0.0168)**	I(1)	0.54202 (0.7061)	-2.72154 (0.0032)**	I(1)
FDV	1.73289 (0.9584)	-1.71548 (0.0172)**	I(1)	-2.19321 (0.0141)**	----------	I(0)
INF	-3.07116 (0.0011)**	----------	I(0)	-5.17352 (0.0000)**	----------	I(0)

*Note: probabilities are presented in brackets, and ** denotes significance at 5% level.*

Source: Researchers' Computation (2023).

The unit root test result presented in Table 3 indicates that under the individual unit root test, economic growth, capital-output ratio, labour force, foreign direct investment, and financial sector development only became stationary at first difference. Hence, they are all I(1) variables. On the

contrary, export diversification index and inflation rate were all stationary at level. Hence, they are I(0) variables. At the common unit root test, the result indicates that economic growth, labour force and foreign direct investment were only stationary after first difference, thus making them I(1) variables. However, capital-output ratio, export diversification index, financial sector development, and inflation were all I(0) variables since they are all stationary at level. It is clear that under the common unit root test and individual unit root test, the variables exhibit mixed order of integration at levels and first difference. Therefore, a test for cointegration is necessary for the study.

4.5 Cointegration Analysis

Given that our variables are not all stationary at level, it is pertinent to ascertain if their linear combinations could yield any substantial result. That is, it is necessary to check whether there could be any long-run relationship among them. This is done by conducting a cointegration test which id done based on Kao residual cointegration test which the result is reflected in Table 4.

Table 4. Kao residual cointegration test result

	t-Statistic	Probability
ADF	-4.5193	0.0000***
Residual variance	25.7387	
HAC variance	10.0944	

*Note: *** denotes significance at 1% level.*

Source: Researchers' Computation (2023).

The result of the cointegration test as reflected in Table 4 indicates that the t-statistic of -4.5193 is significance at 1% given that the probability is too small to accept the null hypothesis of "no cointegration". Thus, we reject the null hypothesis and conclude that there is cointegration in the model. Consequently, both the short-run and long-run models under the autoregressive distributed lag (ARDL) model will be estimated for the three models.

4.6 ARDL Error Correction Model

Since cointegration exist in our model, we proceed to estimate both the short-run and long-run models under the ARDL framework. The choice of this framework arises from the fact that some of our variables were stationary at levels while others were stationary at first difference. The result for the short-run model is presented Table 5 for all the three models.

Table 5. Autoregressive distributed lag (ARDL) short-run result

Variable	Coefficient	Probability
ECM_{t-1}	-0.5085	0.0014**
Δ(EXPD)	-16.1129	0.4640
Δ(GFCF)	0.0824	0.0189**
Δ(LABF)	-16.1129	0.5934
Δ(FDI)	-0.4963	0.6642
Δ(FDV)	0.3345	0.0755*
Δ(INF)	0.8451	0.5467
C	15.8533	0.0014**

*Note: probabilities are presented in brackets; * and ** denotes significance at 10% and 5% level respectively.*

Source: Researchers' Computation (2023).

In Table 6, the error correction term is also negative and statistically significant. The coefficient signifies that 50.85% of the total short-run distortions in the model is corrected on an annual basis. It follows that it will take approximately one year and ten months for equilibrium in the model to be completely restored. The effect of export diversification on growth is also observed to be negative and insignificant in the short-run. This negative effect was earlier discovered by Prebisch (1962), Macbeen & Maizels (1968) and Glezakos (1973). The result further indicates a positive and significant effect of capital stock and financial sector development on economic growth. A 1% increase in capital stock will lead to a 0.0824% increase in economic growth on the average. Furthermore, financial development has a favorable and considerable impact on economic growth, as improved financial infrastructure assists in the resolution of financial and liquidity barriers to export diversification (Francois & Manchin, 2013; Rehman, Ding, Noman, & Khan, 2020; Ngassam et al., 2020) which can spur growth. Thus, a 1% increase in financial sector development will lead to a 0.3345% increase in economic growth. Other variables in the model (labour force, foreign direct investment, and inflation) all exhibited an insignificant influence on growth.

Table 6. Long-run result

Variable	Coefficient	Probability
GFCF	-0.3507	0.0000***
LABF	-1.3476	0.0008***
EXPD	-14.5066	0.1402
FDI	0.4596	0.0000***
FDV	-0.1691	0.0197*
INF	-0.1493	0.1498

*Note: probabilities are presented in brackets; *** and ** denotes significance at 1% and 5% level respectively.*

Source: Researchers' Computation (2023).

In the long-run, the result reflects a different dimension especially on the significance of the variables. From Table 5, it is observed that export diversification exerted a negative but insignificant effect on economic growth within the study period. The result aligns with the findings of Gyimah-Brempong (1991), Fosu (1992), Love (1992), Bakar and Subramaniam (2010), Ocran & Biekpe (2008); and their argument is that "export instability had caused income instability and hampered economic growth" (Sarin *et al*., 2020). It is also observed that foreign direct investment has a positive and significant effect on long-term economic growth. A 1% increase in foreign direct investment inflows will lead to a 0.4596% increase in long-term economic growth. The capital-output ratio is negative and significant and indicates that to attain economic growth, the capital-output ratio must be reduced and this is in line with the prediction of the Harrod-Domar growth model where there is an inverse relationship between the growth of national output and the capital-output ratio. Therefore, a 1% decrease in capital-output ratio will lead to a 0.3507% increase in economic growth. Labour force also put forth a negative and significant influence on economic growth. A 1% increase in labour force will lead to a 1.3476% decrease in economic growth. This could be attributed to a reduction in the marginal physical product of labour in the long-run. Financial sector development and inflation exert a negative influence on economic growth in the long-run, with only financial development being significant. A 1% increase in financial sector development will lead to a 0.2248% decrease in economic growth. This can be associated to the measure of financial sector development which is money supply as a ratio of GDP. As this ratio keeps increasing, it is an outcome of an increase in total money supply over aggregate output. Once this happens, inflation will definitely occur which has been noticed to exert a negative effect on growth.

4.7 Robustness Estimation by Fully Modified Ordinary Least Squares (FMOLS)

To further examine the validity of our earlier result, the FMOLS is deployed and the result is presented in Table 7.

Table 7. Fully Modified OLS Estimates

Variable	Coefficient	Std. Error	t-Statistic	Probability
GFCF	0.0109	0.0816	0.1333	0.8942
LABF	1.2177	0.3842	3.1690	0.0020**
EXPD	-29.2685	12.3731	-2.3655	0.0197**
FDI	0.2421	0.1084	2.2343	0.0274**
FDV	0.0812	0.0849	0.9558	0.3412
INF	-0.3436	0.1558	-2.2057	0.0294**
R-squared	0.7644	Mean dependent var		2.3130
Adjusted R-squared	0.1676	S.D. dependent var		5.0658
S.E. of regression	4.6218	Sum squared residual		2435.1500

*Note: *** and ** denotes significance at 1% and 5% level respectively.*

Source: Researchers' Computation (2023).

The result in Table 6 captures the FMOLS estimates of the model. The result indicates that capital-output ratio exerts a positive but insignificant effect on economic growth. Labour force is observed to exert a positive and significant effect on economic growth. Thus, a 1% increase in labour force leads to a 1.2177% increase in economic growth on the average. The effect of export diversification on growth is negative and significant. Consequently, a 1% increase in export diversification will lead to a 29.2685% decrease in economic growth on the average. This finding contradicts Hesse's (2008) conclusion that diversifying exports is beneficial for developing countries because it may help them to resist export volatility or the negative impacts of trading conditions for main products. Similarly, inflows of foreign direct investment have a favourable and considerable impact on economic growth. Financial development has a positive but negligible impact on growth, but inflation has a negative and considerable impact on growth. Therefore, a 1% increase in the rate of inflation will lead to a 0.3436% decrease in economic growth.

4.8 Granger Causality Test

In order to ascertain the direction of causality concerning export diversification, financial sector development, and economic growth the Granger causality test is conducted and Table reflect the result.

Table 8. Pairwise Granger causality test result

Null Hypothesis	Observations	F-Statistic	Probability
EXPD does not Granger Cause ECGT	120	6.40247	0.0023**
ECGT does not Granger Cause EXPD		0.63418	0.5322
FDV does not Granger Cause ECGT	120	1.30182	0.276
ECGT does not Granger Cause FDV		0.27371	0.761
FDV does not Granger Cause EXPD	120	1.33966	0.266
EXPD does not Granger Cause FDV		0.13908	0.8703

*Note: ** denotes significance at 5% level.*

Source: Researchers' Computation (2023).

From the result in Table 8, it could be observed that a unidirectional causality flows between export diversification and economic growth. Thus, export diversification causes economic growth and not economic growth causing export diversification. Also, there is no causality between financial development and economic growth; as well as no causality between financial development and export diversification.

4.9 Policy Implications of Findings

Based on the robustness estimation of our model using the FMOLS approach, it can be seen that the effect of export diversification on economic growth within the West African Sub-Region is a negative and significant one. Also, the effect of financial sector development on economic growth is positive but insignificant. The policy implication of this findings is that a needs to understand the fact that comparative advantage must be considered in order to benefits from export diversification (Cadot *et al*., 2013). At the early stage of diversification, a country needs to have effective exports product in order for growth to be achieved. Excessive diversification will likely lead to less effective export products with little or no comparative advantage or new markets where the existing export products have little or no comparative advantage. In this situation, export diversification could not bring forth the needed growth. as argued by Dennis and Shepherd (2011), it is necessary to have an extensive margin diversification if there should be a shift primary to manufactured goods as export composition. The negative effect of export diversification could also be linked to the inability of the financial system to exert a significant effect on the economy which could propel growth within the Western Africa.

5. Conclusion and Suggestion for Further Research

Export diversification has been noted in the literature to be a driver of growth as it reduces the risk of commodity shocks and price instabilities. However, excessive export diversification could have some defects such as the case of lack of intensive export products in the market, and possible lack of comparative advantage. In this study, we explored the influence of export diversification and financial sector development on the growth of the West African economy for the period of 2007 to 2020. Ten West African countries were sampled and the study utilized the ARDL, FMOLS, and Granger causality test in the analysis. The study has indicated that the effect of export diversification on the economic growth of West African countries is negative but insignificant both in the short-run and in the long-run based on the ARDL estimation. However, the robustness check based on the FMOLS revealed that export diversification has a negative and significant effect on economic growth within the region. Thus, an increase in export diversification will lead to a decrease in economic growth. This finding therefore points to the need for the West African countries to specialize in the production of exports products where they have comparative advantage in order to have an effective export product. Thus, specialization is required in this case, and export concentration needs to be the order of the day. This is because having a few strong export product bases could promote efficiency in production and attendant increased output and earnings, rather than having numerous products with little or no comparative advantage. The study therefore concludes that West African countries could benefit from international trade by specializing in the production of export commodities that they have comparative advantage. This is because the West African sub-region cannot benefit from diversification without a

proper recognition of comparative advantage. It is therefore suggested that future studies should investigate into the influence of export concentration on economic growth in West Africa in order to ascertain whether such will be beneficial or not.

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