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The Relationship between Financial Development and Economic Growth: The Case of West African Countries

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Abstract

This study examines the relationship between financial development and economic growth in seven countries of the Economic Community of West African States (ECOWAS) from 1970 to 2018. Vector autoregression and the Granger causality method were employed in this study to reveal the impact of financial development on investment, which is essential for long-term economic growth. In our study, investment, credit to the private sector, broad money, foreign direct investment, general government final expenditures, foreign trade, and savings are used as variables. The results of the analysis reveal that financial development indicators have a positive effect on investment. However, the degree of this effect differs from country to country. Credit to the private sector and broad money, which are indicators of financial development in some countries, have a low impact on investment, while in other countries, the impact is strong. Regarding Granger causality, four different results werefound across the countries:a bidirectional causality between financial development and investment, a unidirectional causal flow from investment to financial development, a unidirectional causal flow from financial development indicators to investment, and no causality between financial development and investment.

Keywords: Financial development, Economic growth, financial integration, financial stability, vector autoregression (VAR), Granger causality. JEl Classification codes: E20; F63; G33; O11

1. Introduction

The financial system, which includes financial markets and intermediaries, such as banks and insurance companies, as well as government regulators, facilitates the transfer of savings to investment. When financial markets function well, theypromote high economic growth, but many countries remain poor because of the poor performance of financial markets (Mishkin et al., 2012). Therefore, the role of the financial system in economic development is extremely important. Studies on the relationship between financial development and economic growth continue to attract the attention of economists at both theoretical and empirical levels. Some studies have examined the relationship between financial development and economic growth, while others have attempted to find the direction of this relationship.

The results of many empirical studies have revealed a positive relationship between financial development and economic growth (Levine, 2005;Christopoulos and Tsionas, 2004;Köse, 2017; Pagano,

1993; De Gregorio and Guidotti, 1995; Levine and Zervos, 1998). There are two hypotheses about the causal relationship between financial development and economic growth, which are supply-leading and demand-following financial development. The supply-leading hypothesis assumes a causal relationship from financial development to economic growth. Establishing financial institutions and markets increases the supply of financial services,leading to real economic growth. The demand-follow hypothesis proposes a causal relationship from economic growth to financial development (Calderón and Liu, 2002). Studies on the direction of the relationship between financial development and economic growth have yielded different results. While some of them found a unidirectional supply-leading causal relationship such as Özcan and Ari (2011) and Christopoulos and Tsionas (2004), others found a bidirectional causal relationship such asSönmez and Sağlam (2017).

This study focuses on an important aspect of economic activity, namely domestic investment, which plays a crucial role in economic growth in the long-term. We assume that financial resources in an economy should be used for productive investment to increase national output. Our study examines the relationship between financial development and investmentin six countries of the Economic Community of West African States (ECOWAS) using vector autoregression (VAR) and Granger causality analysis. The data are annual data retrieved from the World Bank website and cover the period 1970–2018.In our study, investment, credit to the private sector, broad money (M3), foreign direct investment, general government final expenditures, foreign trade, and savings are used as variables. At the end of our research , we foundthat the financial development in ECOWAS countries has a positive impact on investment. But since the financial system of the countries is underdeveloped this effect is quite weak. Therefore, strengthening the financial system can have a significant impact on investment and contribute to the economic growth of these countries.

2. Literature Review

The interdependence of financial development and economic growth has been studied by many researchers. However, they have not reached a consensus on the role of financial development in economic growth or the role of economic growth in financial market development. The relationship between financial development and economic growth was first theoretically studied by Schumpeter in 1911. According to Schumpeter, financial services such as deposit-taking, project evaluation, risk management, managerial supervision, and business facilitation provided by financial intermediaries are essential for technological innovation and economic development. According to (King and Levine, 1993), Goldsmith (1969) and McKinon (1973) empirically demonstrated that there is a close relationship between finance and economic growth.

In their studies based on the relationship between financial development and economic growth,De Gregorio and Guidotti (1995)determined that financial development ensures economic growth, but this effect varies by country and time.They also suggestedthat the main transmission channel from financial development to growth is the effect of the efficiency of investment but not its level.Levine and Zervos (1998) examined the relationship between financial development and economic growth, finding that there is a strong and positive relationship between the liquidity of the stock market and the development and growth of the banking sector.

Christopoulos and Tsionas (2004) examined the relationship between financial development and economic growth using panel unit root and cointegration tests. Financial depth, investment share, and inflation were the main variables of the study. While it found that the economic relationship with financial development was significant, it revealed that there was strong evidence of longrun causality from financial development to growth, but no evidence of bidirectional causality was found. Moreover, Christopoulos and Tsionas (2004) focused on cross-section and time series, gross domestic product (GDP), investment share, and inflation and found strong evidence for the long-term causality hypothesis from financial development to growth, but no evidence for bidirectional causality was found.

Levine (2005) examined the theory and empirical studies on finance and growth, studying real GDP growth per capita, real capital growth per capita, productivity growth, DEPH, bank, private, and turnover elements. The study found that there is a strong link between financial functioning and long-term economic growth.

Jeanneney and Kpolar (2006) studied financial development, financial instability, and economic growth using the panel data method.They found that there is a positive relationship between credit/GDP, civil liberties index, inflation, liquid assets/GDP, financial development, and financial instability. They also found that financial development provides economic growth but the accompanying financial instability reduces this effect.Yuncu (2007) analyzed the relationship between financial development and economic growth using the dynamic panel data method. It was found that there is a significant and positive relationship between the banking sector and financial market developments and economic growth. The bidirectional causality relationship was found to have a positive effect on economic growth, along with the futures markets.

Yahyaoui and Rahmani (2009) studied the relationship between financial development and economic growth and the role of institutional quality. Theoretically, good governance is a determinant of financial development. They found that the elements of good governance provide a conducive environment for financial development and hence economic growth. Their empirical results revealed that the quality of governance is a key determinant of financial development.Akinlo and Egbetunde (2010) examined the relationship between financial development and economic growth in 10 Sub-Saharan African countries using the vector error correction model (VECM) and Granger causality method. The results of the Granger causality test revealed three different results depending on the country, findinga one-way causality from financial development to economic growth, a one-way causality from economic growth to financial development, and a bidirectional causality between financial development and economic growth.

Misati and Nyanmongo (2011) investigated the relationship between financial sector development and private investment using panel data on 18 African countries from 1991 to 2004, finding that the negative relationship between the deposit rate and private investment indicates very highinterest rate spreads in African economies. A positive relationship was found between private sector credit and turnover rate and private investment. However, the effect of the turnover rate on investment is insignificant. The insignificance of the stock market indicator reflects the low stage of development of stock markets in most African economies. The results also revealed that despite two decades of reforms, the informal sector is still large and has a positive impact on private investment. In addition, the corruption perception

index is a significant variable.Özcan and Ari (2011) conducted an empirical analysis of the relationship between financial development and economic growth using the VAR and Granger causality test. A unidirectional relationship was found between financial development and economic growth in Turkey, and the direction of this relationship is from economic growth to financial development.

Mercan and Peker (2013) found that the effect of financial development on economic growth was statistically significant and was in the same direction as the theoretical expectation. Çiftçi (2015) investigated the relationship between financial development and economic growth, employing an extended Solow growth model using panel cointegration and panel quantile regression. It was found that bank market-based financial systems are better at promoting economic growth in the long run compared with equity market-basedfinancial systems.

Law and Singh (2014) found that there is a certain level of financial development and economic growth that is beneficial. Financial growth beyond this level canhave a negative impact on the economy. These findings revealed that more finance is not necessarily good for economic growth and emphasizedthat an optimal level of financial development is more important to enable growth.Akbas (2015) conducted a panel causality analysis of financial development and economic growth in emerging markets, employing the following variables: domestic bank credit to GDP, private sector credit to GDP, savings to GDP, GDP to total exports and imports of goods and services, and the real interest rate. A weak relationship and no causality relationship were found between financial development and the economy in developing countries, except for Turkey.

Ngongang (2015) investigated the relationship between financial development and economic growth in Saharan African countries using the generalized method of moments. The results revealed that financial development does not affect economic growth. The absence of this relationship may be related to the underdeveloped financial systems of Sub-Saharan Africa or the instability of GDP growth rates in this region.Muyambiri and Odhiambo (2018) examined the relationship between financial development and investment in the island of Mauritius using the Granger causality method. They found that financial development in Mauritius controls investment in both the short and long run. It was suggested that the strengthening of the banking sector and the development of the stock market in Mauritius should be intensified to encourage investment.

Ahmad et al. (2016) analyzed the development of financial markets, global financial crises, and economic growth in developing countries in Africa from 1982 and 2012 using the regression method. They found a positive relationship between financial development and economic growth. In particular, market capitalization, turnover ratio, and bank credit have a significant positive relationship with growth, but financial crises reduce the impact of the financial market. Employing VECM,Bekana (2016) examined the development of the financial sector and whether it can provide growth in the postcommunist economy, particularly in Ethiopia. In the model, inflation, money circulation to GDP, domestic credit to the private sector to GDP, GDP growth rate, government expenditures relative to GDP, and trade (exports minus imports) to GDP were included as variables. It was determined that the development of financial sectors is an important economic growth factor in the Ethiopian economy in the short term, but it does not reach the minimum level required to support long-term economic growth in the financial sector development.

Cojocaru et al. (2015) examined the relationship between financial system development and economic growth in transition economies, Eastern European countries, and the Commonwealth of Independent States. They found that interest rate spread and overhead cost have a negative effect on growth and are statistically strong and significant;bank concentration has a negative and significant effect;private credit is positive and significant;the financial structure has a positive effect; and secondary school enrollmenthas a positive effect.The efficiency and competitiveness of the financial system are more important than the amount of credit provided by the banking system to the private sector.Okonah (2017) analyzed the impact of the development of financial markets on economic growth in Ghana, employingregression analysis.The study revealed thatGDP and stock market capitalization have a strong positive effect on the relationship between the development of financial markets and economic growth, but there was no causality.

Köse (2017) examined the relationship between financial development and economic growth in emerging markets, employingtime series techniques, autoregressive distributed lag (ARDL), VAR, VECM, Granger causality tests, and clustering. The study found that there is a relationship between financial development and economic growth. It was also found that credit to the private sector, banking data, and financial market variables, that is, stock market data,have a significant impact on market capitalization and economic growth.Sönmez and Sağlam (2017) conducted a comparative analysis of the Eurozone and European developing countries and examined the relationship between financial development and economic growth. The longrun estimation coefficients revealed that there is a negative relationship between financial development and economic growth.

Ehigiamuso and Lean (2018) examined the relationship between financial development and economic growth in West African countries. GDP, private sector credit, liquid liabilities, public expenditure, foreign trade, human capital, and inflation rate were the main variables of the study. It was found that financial development can accelerate economic growth and that the differences in financial development between countries can cause differences in economic growth.Hasan, İnam and Saleemi(2017) analyzed the effect of financial development on economic growth in Pakistan using the ARDL method, employing the following variables: GDP, financial depth index, liquid liabilities, private sector credit, total assets of commercial banks, and commercial bank to central bank ratio. The study highlighted the importance of financial sector development in the growth of Pakistan’s economy and drew policymakers’ attention to further strengthen Pakistan’s financial sector.

Taha et al. (2018) examined the relationship between tax reforms, financial development, and economic growth in Malaysia. The panel data method was applied in their study, andthe variables were tax credits to the private sector M2 and GDP. They found that there is no significant relationship between financial development and tax, and there is a bidirectional causality between tax and GDP growth.Jugurnath et al. (2018) studied the financial structure and economic growth in Brazil, Russia, India, China, and South Africa, referred to as BRICS countries. They applied the panel data method, and GDP, private sector credit, stock market capitalization, secondary school enrollment, real interest rate, and foreign trade variables were included in the model. It was found that financial development and economic growth are related, and these relationships were found in rapidly developing and developing economies.

Tsaurai (2018) applied the panel cointegration method to examine the complementarity between foreign aid and financial development as drivers of economic growth in selected emerging market economies. The variables employed in the study were economic growth, foreign aid, domestic financial sector credit, domestic private credit from banks, extraordinary domestic private debt and the stock market, inflation, savings, and infrastructure. It was found that complementarity between foreign aid and financial development has a significant positive effect on economic growth.

3. Data and Methodology

The data cover 1970–2018 and were obtained from the World Bank website. The study focused on six ECOWAS countries, and the VAR and Granger causality method were employed. The following variables were used in the study:

- Credit to the private sector (CP)
- Money supply (M3) to GDP ratio
- Foreign direct investment (FDI) to GDP ratio
- General government final expenditure (GOV) to GDP ratio
- Foreign trade (TRADE) to GDP ratio
- Savings to GDP ratio
- Investment (INV)

3.1 Stationarity Detection: Unit root testing

One of the basic assumptions of time series is that they are stationary. Stationarity means that the statistical properties of the process, such as mean and variance, do not change over time. The unit root test is performed to determine the stationarity of the time series. In this study, the Augmented–Dickey–Fuller (ADF) test was performed.

3.1.1 Dickey–Fuller (DF) unit root test

Dickey and Fuller (1979) developed a unit root test to test stationarity in time series. They introduced a set of statistical tools to detect the presence of a unit root in a first-order autoregressive process (AR). The DF test is based on the leastsquares method.

The following equation is used to explain the unit root test:

$$Y_t = Y_{t-1} + u_t \quad (1)$$

Such error term series is called white noise. The value of Equation (1) in the *t* period is the regression with the $t-1$period, namely AR(1) regression. In this equation, if the coefficient of $Y_{t-1}$is equal to 1, there is a unit root problem, so the series is not stationary because the variable *Y* is related to its previous value. Thus,

$$Y_t = \rho Y_{t-1} + u_t \quad (2)$$

If the regression calculation indicates that $\rho=1$, it means that there is a unit root. In econometrics,a series with a unit root is calleda random walk series.

The following three equations are used in the DF unit root test:

Test equation without constant and trend variable:

$$\Delta Y_t = \delta Y_{t-1} + u_t \quad (3)$$

Test equation with constant term:

$$\Delta Y_t = \beta_1 + \delta Y_{t-1} + u_t \quad (4)$$

Test equation with constant and trend variables:

$$\Delta Y_t = \beta_1 + \beta_{2t} + Y_{t-1} + u_t \quad (5)$$

Here,*t* is the trend variable, and Δ is the difference operator.

3.1.2 ADF Unit Root Test

For the DF test to be reliable, $u_t$must have the "clean string" property. Thus, it should be without autocorrelation and with constant varianceonly then can the DF-1979 test be applied. The variance can be stabilized by taking the logarithm of the series.

When there is an autocorrelation problem in DF equations, the ADF equation is estimated to eliminate it. The ADF test equation is written as follows:

Test equation with constant and trend:

$$\Delta \mathrm{Yt} = \beta 1 + \beta 2 \mathrm{t} + \delta Y_{t-1} + a_i \sum_{k=0}^{m} \Delta \mathrm{Yt} Y_{t-1} + \varepsilon_i (6)$$

The hypotheses to be established in the unit root analysis are as follows:

H_0: There is a unit root

H_1: No unit root

If the absolute value of the test statistic is greater than the critical value or the probability value is less than 0.05 (prob.< 0.05), H_0 is rejected, that is, the series has no unit root. If the absolute value of the test statistic is less than the critical value or the probability value is greater than 0.05 (prob.>0.05), H_0 is accepted, thatis, the series has a unit root.

3.2 VAR Analysis

VAR is a generalization of autoregressive (AR) processes in multivariate situations. The VAR model was developed by Sims in 1980 and is a statistical model that captures the interdependencies between multiple time series. In this model, two endogenous variables are associated with the lagged values of both itself and the other endogenous variable for a certain period. Sims criticized the internal–external distinction in the structural model (Akyüz, 2018). By considering the $Y_t$and X_t series, the VAR model is determined as follows:

$$Y_t = \alpha + \sum_{j=1}^{m} \beta_j Y_{t-j} + \sum_{j=1}^{m} \delta_j X_{t-j} + \varepsilon_{1t} \quad (7)$$

$$X_t = \alpha + \sum_{j=1}^{m} \theta_j Y_{t-j} + \sum_{j=1}^{m} \vartheta_j X_{t-j} + \varepsilon_{2t} \quad (8)$$

Here,$\mathcal{E}_{1t}$and$\mathcal{E}_{2t}$are the error terms. The lagged values of *Y* affect the *X* variable, and the lagged values of *X* affect the *Y* variable. In this model, as only lagged variables are on the right side of the equations, the values to be found by the leastsquares method will be consistent.

3.2.1 Impulse Response Analysis

Impulseresponse functions are used to interpret the VAR model. Impulseresponse functions allow the effects of shocks on variables to be plotted with time using graphs and tables. This procedure is used to understand in which variable the shocks will occur and how the variables respond to these shocks.

3.2.2 Variance Decomposition Analysis

The variance decomposition examines what percentage of the change in one variable is due to other variables. If 100% of the change is explained by itself, it is considered an exogenous variable.

3.2.3 Granger Causality Test

The Granger causality test is used to statistically determine the direction of causality of the relationship between two variables in time series, where variable *X* is the Granger cause of variable*Y*if theprevious value of *X* helpsto explain *Y*.

For the Granger causality test, the following hypotheses are determined by using the VAREquations (7) and (8).

In the first model (7),

Ho: $\sum_{i=1}^{m} \alpha_i = 0$; *X*doesnot Granger cause *Y*

$H1$: $\sum_{i=1}^{m} \alpha_i \neq 0$; *X* Granger causes*Y*

In the second model (8),

Ho: $\sum_{i=1}^{m} \delta_i = 0$; *X* does not Granger cause *Y*

$H1$: $\sum_{i=1}^{m} \delta_i \neq 0$; *X* Granger causes

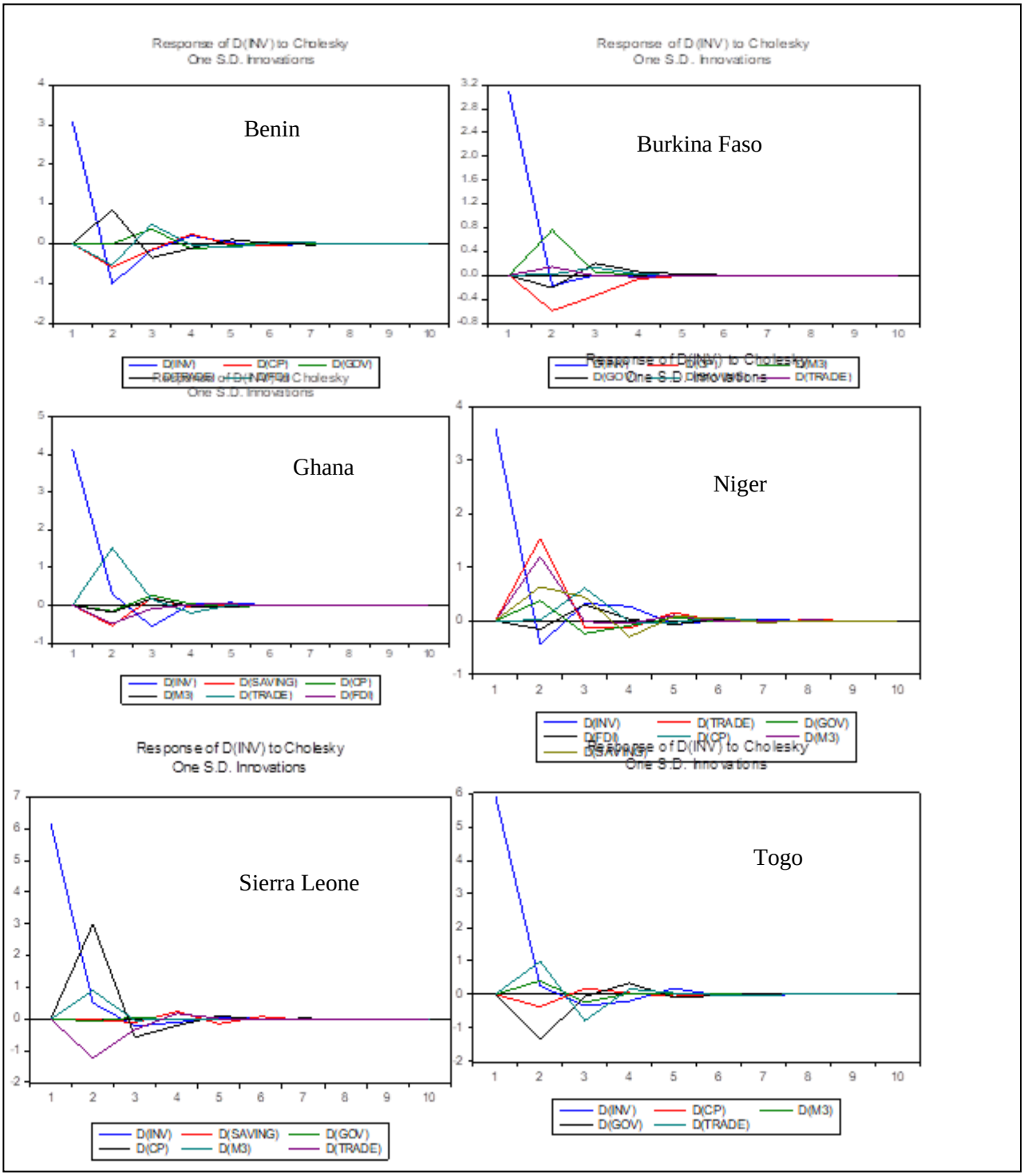
4. Results

4.1. Unit Roots test

Annex 1 presents the results of the unit root tests. Variables that are stationary at the level according to the result of the ADF test are not included in the VAR models for each country; only variables that are stationary at the first difference are used.

4.2. Impulse Response Function

Figure 1. Impulse Response Function



In Benin, a shock to the private sector does not affect investment in the first period, and this effect becomes negative in the first and second periods. However, the effect becomes positive from the third to the fourth period and finally reduces to 0. The response of investment to a shock to foreign direct investment was negative until the second period and then became positive. From the third period onward, this response was still positive, but it followed a decreasing path. When faced with a shock to foreign trade, investment did not react at all until the second period, but from the second to the fourth period, it reacted positively.

In Burkina Faso's model, a shock to private sector credit had a negative effect on investment. A shock to the foreign trade variable affected investment positively from the first to the third period. We found a rapidly increasing positive trend in the first and second periodsand a response of investment to a shock to money supply. From the second period, this response was still positive, but it experienced a decreasing trend. The savingsvariable was ineffective until the second period but had a positive effect on investment from the second period. Although investment responded negatively to public expenditure until the second period, it became increasingly positive in the following period.

In Ghana, the response of investment to a shock to foreign trade was positive in the first and second periods. This response started to decline rapidly from the second period and became negative after the fourth period. The investment level was negative to a shockto savings in the first and second periods, increased from the second period, and became positive after the third period. Investment responded negatively to the shock from the private sector credit and money supply until the second period, but the response was positive from the second to the fourth period. It also responded negatively to the shock from foreign direct investment. However, the response was negative until the third period and then became positive.

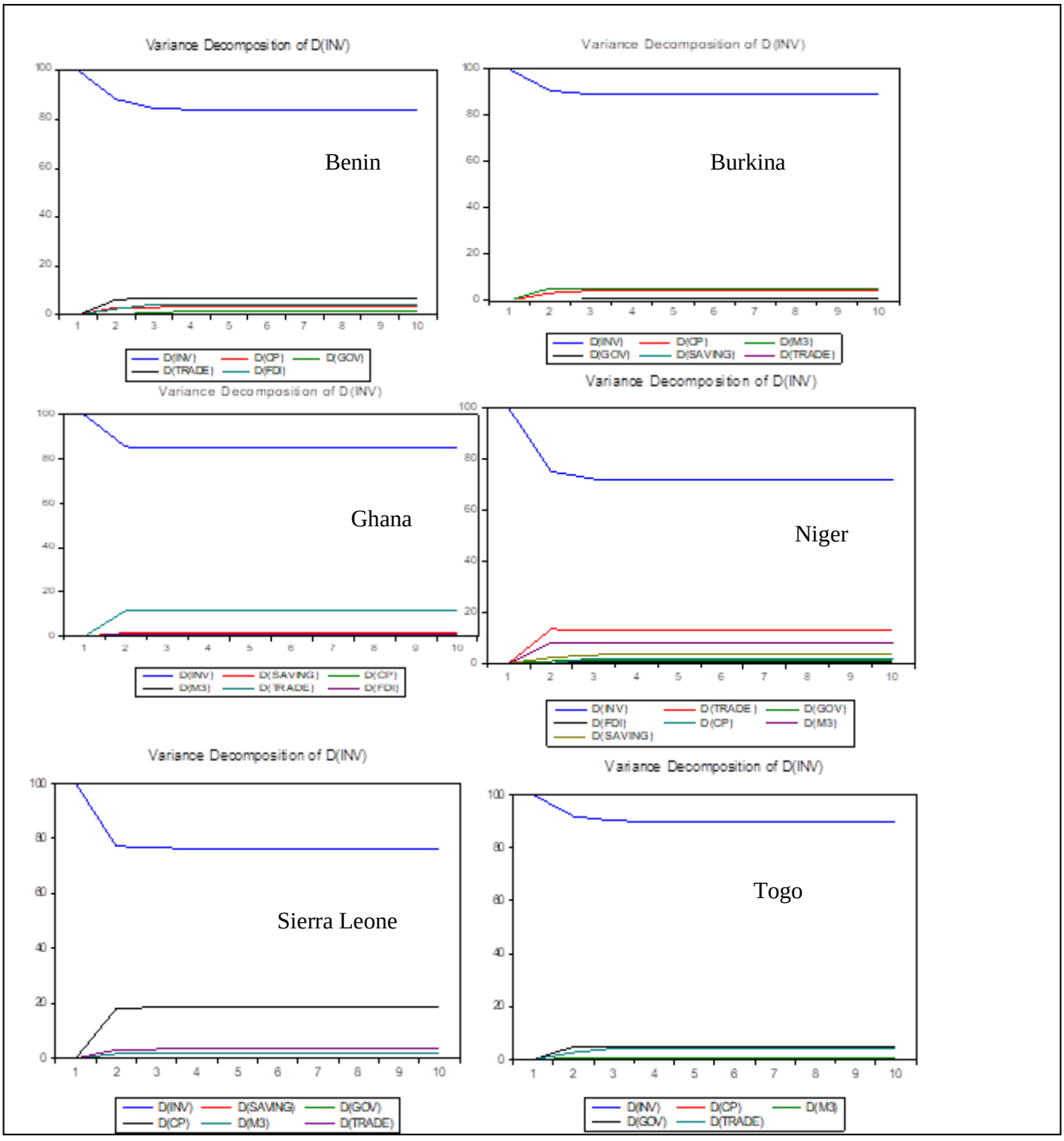
Regarding Sierra Leone's model, the response of investment to a shock in the private sector credit was positive up to the third period and then became negative. The effect of foreign trade was negative until the third period, while the effect ofmoney supplywas positive until the third period. Similar topublic expenditure, the savings variable was positive from the first to the third period, but from the third period, the effect of saving was negative, while the effect of public expenditure declined to null.

In Niger, there was an increasingly positive effect of private sector credit andmoney supply on investment in the first and second periods, and their effects were positive but started decreasing from the second period. This effect became negative from the second period. FDI and foreign trade had a positive effect from the first to the fourth period. The effect of savings was positive until the third period and became negative from the fourth period. Investment responded positively to public expenditure shock and then negatively until the third period.

In Togo, the response of investment to a shock on the private sector credit was negative from the first to the third period and positive from the third period. While the response of investment to money supply shock was positive until the second period, it became negative from the third period. The effect of public expenditure on investment became positive until the third period and then became negative. The response of investment to the shock from foreign trade was positive until the second period and then decreased and became negative from the third period. The response became positive again from the fourth period.

4.3. Variance decomposition

Figure 2. Variance decomposition



in Benin, the investment variable is explained by its own shocks in the first period. From the third period, the investment variable explained 84% of itself, 10%was explained by foreign trade, 4% by private sector credit, 1% by FDI, and 1% by public spending.
In Burkina Faso, the investment variable in the first period wasexplainedby its own shocks. From the second to the tenth period, the investment variable explained 89% of itself, 5%was explained by foreign trade, 2% by private sector credit, and 1% by public expenditures.
In Ghana, investment was 100% self-explained in the first period. From the second period, investment explained 85% of itself, 11% was explained by foreign trade, 2% by private sector credit, and 2% by savings.
In Niger, in the first period, investment was 100% explained by its own shocks, and in the second period, investment explained 75% of itself. From the third to the tenth period, 72% was explained by itself; 12% by foreign trade; 10% by money supply; 3% by FDI; and 3% by savings, private sector, and public expenditures.
In Sierra Leone, in the first period, investment was 100% self-explained, and in the second period, 77% was self-explained. From the third to the tenth period, 76% wasself-explained; 18% by private sector loans; 3% by foreign trade; and 3% by savings, money supply, and public expenditures.
In Togo, in the first period, investment was 100%self-explained,and in the second period, 92% was self-explained. From the third to the tenth period, 90% was explained by own shocks, 5% by public expenditures, 4% by foreign trade, and 1% by money supply and private sector credit.

4.4.Granger causality test

According to the results of the Granger causality test depicted in annex, in Benin, there isaunidirectional causality from investment to private sector credit, a causal relationship from private sector credit to foreign trade, and a causal relationship from investment to foreign trade.

In Burkina Faso, money supply and savings have a causal relationship withtrade. There are causal relationships from foreign trade to FDI and from FDI to private sector credit.

In Ghana, there are causality from private sector credit to investment, a causalityfrom private sector credit to FDI, and a causality from FDI tomoney supply. There is also a causal relationship between private sector credit and foreign trade, as well as between FDI and foreign trade.

In Niger, there is a bidirectional causality between money supply and investment. There is a causalityfrom foreign trade to investment. There are causal relationships from savings to public expenditure, from private sector credit to foreign trade, and from money supply to foreign trade.

In Sierra Leone, causality relationships were found from private sector credit to investment, from foreign trade to investment, from money supply to investment, and from private sector credit to foreign trade.

In Togo, there is a causal relationship from investment to private sector credit, from investment to public expenditure, from foreign trade to investment, from foreign trade to private sector credit, and from public expenditure tomoney supply. There is a bidirectional relationship between foreign trade and public expenditure.

5. Conclusion and Recommendations

This study examined the relationship between financial development and economic growth in ECOWAS countries using VAR and Granger causality analysis. The results of the analysis revealed that indicators of financial development have a positive effect on investment in the medium and long-term. However, this effect varies by country. According to the variance decomposition tests, the financial development indicator(money supply) explains 18% of investment in Sierra Leone, while the effect of credit to the private sector is 10% in Niger and 4% in Benin. In Ghana, Burkina Faso, Gambia, and Togo, this effect varies from 1% to 2%.TheGranger causality analysis revealed four different results between financial development and investment, which are a one-way causality from financial development to investment, a one-way causality from investment to financial development, a bidirectional causality between financial development and investment indicators, and the absence of causality.

First, a one-way causality relationship from financial development to investment was found in Ghana and Sierra Leone. This implies that financial development drives the economy in these countries. In this regard, Iheonu et al.(2020) studied the relationship between financial development and investment in ECOWAS countries and found that private sector credit boosts investment but money supply has a negative effect. However, the current study found a positive and strong effect of money supply on investment in Sierra Leone, which is consistent with the findings byMisatiand Nyanmongo (2011). Furthermore, Adu et al.(2013) studied the relationship between financial development and economic growth in Ghana, finding that while the private sector is positively affected by credit growth, money supply has a negative effect on economic growth.

Second, there is a one-way causality from financial development to investment in Togo and Benin, wheretheeconomies are dependent on investment. Huang (2011) found thatprivate investment has a positive effect on financial development. Therefore, economic policy should take measures that increase investment. This is because investment leads to economic growth (Khan andReinhart, 1990).

Third, a bidirectional causality between financial development and investment was found in Niger. The results of the VAR and Granger causality revealed that Niger has a good economic structure with important relationships among all variables, with financial development indicators occupying an important place in these relationships. In their study of West African countries,Gelbard, Gulde and Maino. (2014) found a positive relationship between financial development and economic growth. They suggested that regional financial integration, strengthening financial regulation, and improving access to financial services can ensure financial development.

Finally, there is no causal relationship between financial development and investment in Burkina Faso. The results of the VAR and Granger causality analysis revealed that the economy of Burkina Faso is dependent on external variables such as foreign trade and FDI.

In conclusion, financial development in ECOWAS countries has a positive effect on investment, but as the financial systemsof these countries are underdeveloped, this effect is quite weak. Therefore, strengthening the financial system can have a significant impact on investment and contribute to the economic growth of these countries. To strengthen financial development, a strong legal and institutional framework and sound corporate governance are prerequisites. Improving corporate governance and information disclosure, particularly by aligning accounting, auditing, and financial

reporting standards with international best practices, will support financial sector development. There is alsothe need to improve access to financial services in these countries. According to World Bank reports,West Africa has the lowest rate of financial inclusion; thus, tostrengthen the banking system, banks need to increase the number of customers. The number of branches can be increased, therebyimproving access to financial services for more deposits. Investment banks and participation banks can make an important contribution to the expansion of banking activities at this point.In addition, banks should increase lending to the private sector and raise the amounts for long-term loans to encourage investment.

In addition, the government should promote industrialization through public organizations. It should encourage industrial production through special incentives such as land allocation and exemption from value-added tax for industries in sectors of priority and strategic importance. Incentives should also be created to attract the attention of foreign investors to the country and laws should be created to protect them.

REFERENCES

1. Adu, G., Marbuah, G., Mensah, J.T., 2013. Financial development and economic growth in Ghana: Does the measure of financial development matter? Rev. Dev.Financ. 3, 192–203.https://doi.org/10.1016/j.rdf.2013.11.001.
2. Akbas, Y. E. (2015). Financial development and economic growth in emerging market: bootstrap panel causality analysis. Theoretical & Applied Economics, 22(3).
3. Akinlo, A. E., &Egbetunde, T. (2010). Financial development and economic growth: The experience of 10 sub-Saharan African countries revisited. The review of finance and banking, 2(1).
4. Akyüz, H .E., 2018. VektörOtoregresyon(VAR) ModeliileİklimselDeğişkenleriinİstatistikselAnalizi. UluslararasıMühendislikAraştırmaveGeliştirmeDergisi. 10, 184–192.https://doi.org/10.29137/umagd.402272
5. Ahmad, R., Etudaiye-Muhtaret, O. F., Matemilola, B. T., Bany-Ariffin, A. N., 2016. Financial market development, global financial crisis and economic growth: evidence from developing nations. Port.Econ. J. 15, 199–214. https://doi.org/10.1007/s10258-016-0123-8
6. Bekana, D. M., 2016. Does financial sector development drive economic growth in a post-communist economy? Evidence from Ethiopia. Econom. Insights-Trends Chall. 68, 15–38.
7. Calderón, C., &Liu, L. (2003). Thedirection of causalitybetweenfinancialdevelopmentandeconomicgrowth. Journal of developmenteconomics, 72(1), 321-334.https://doi.org/10.1016/S0304-3878(03)00079-8
8. Cojocaru, L., Falaris, E. M., Hoffman, S. D., & Miller, J. B., 2015. Financial systemdevelopmentandeconomicgrowth in transitioneconomies: New empiricalevidencefromthe CEE and CIS countries.Emerg. Mark.Financ. Tr. 52, 223–236.https://doi.org/10.1080/1540496X.2015.1013828.
9. Christopoulos, D. K., &Tsionas, E. G. (2004). Financial developmentandeconomicgrowth: evidencefrom panel unitrootandcointegrationtests. Journal of developmentEconomics, 73(1), 55-74.https://doi.org/10.1016/j.jdeveco.2003.03.002

10. Çiftçi, D. D., 2015. Finansal gelişme ve ekonomik büyüme ilişkisi: Bir genişletilmişSolow Büyüme Modeli denemesi ve ampirik uygulama. *Doktora Tezi*. Denizli: Pamukkale Universityi Institute of Social Sciences.
11. De Gregorio, J., Guidotti, P.E., 1995. Financial development and economic growth. World Develop. 23, 433–448. https://doi.org/10.1016/0305-750X(94)00132-I.
12. Dickey, D. A., & Fuller, W. A. (1979). Distribution of the Estimators for Autoregressive Time Series with a Unit Root. Journal of the American Statistical Association, 74(366a), 427–431. https://doi.org/10.1080/01621459.1979.10482531
13. Ehigiamusoe, K.U., Lean, H.H., 2018. Finance–growth nexus: New insights from the West African Region. Emerg. Mark.Financ. Tr. 54, 2596–2613.https://doi.org/10.1080/1540496X.2017.1364623.
14. Frederic S. Mishkin, Stanley G. Eakins (2012); Financial market andInstıtutions 7Th edition, PearsonEduction.
15. Gelbard, E., Gulde, A. M., &Maino, R. (2014). Développement financier en Afrique subsaharienne: les enjeux pour une croissance soutenue. Revue d'économie financière, (4), 19-42.
16. Hassan, M. R., Inam, S. G., &Saleem, M. S. (2017). Analyzing the effects of financial development on economic growth: Empirical evidence from Pakistan through PCA approach. Abasyn Journal of Social Sciences.: https://ssrn.com/abstract=3691880
17. Huang, Y., 2011. Private investment and financial development in a globalized world. Empir. Econ. 41, 43–56.https://doi.org/10.1007/s00181-010-0394-3.
18. Khan, M. S., Reinhart, C. M., 1990. Privateinvestmentandeconomicgrowth in developingcountries.World Develop. 18, 19-27.DOI:https://doi.org/10.1016/0305-750X(90)90100-C
19. Jeanneney, S.G.,Kpolar, K., 2006. Developmentfinancier, instabilité financiereet croissance economique. Economie&Prévision. 3, 87–111.https://doi.org/10.3406/ecop.2006.7954;
20. Jugurnath, B., Elahee, A., Fauzel, S., Soondram, H.,2018 . Fınancıalstructuresandeconomıcdevelopment: EmpırıcalevıdencefromBrıcscountrıesandMaurıtıus. J. Develop. Areas. 52, 131–155.
21. Köse, K., 2017. Financial development and economic growth nexus in emerging market countries. Dctoral Thesis. İstanbul: Yeditepe University, Institute of Social Sciences.
22. Law, S.H., Singh, N., 2014. Does financial development harm economic growth? J. Bank. Financ. 41, 36–44.https://doi.org/10.1016/j.jbankfin.2013.12.020.
23. Levine, R., 2005. Finance and growth: Theory and evidence, in:Aghion, P., Durlauf, S. N. (Eds.), Handbook of Economic Growth, Elsevier, Amsterdam, pp. 865–934.https://doi.org/10.1016/S1574-0684(05)01012-9
24. King, R. G., & Levine, R. (1993). Finance and growth: Schumpeter might be right. The quarterly journal of economics, 108(3), 717-737.https://doi.org/10.2307/2118406
25. Levine, R.,Zervos, S., 1998. Stock markets, banks and economic growth. Am. Econ. Rev. 88, 537–598.
26. Mercan, M., Peker, O., 2013. Finansal gelişmenin ekonomik büyümeye etkisi: Ekonometri bir analiz, Eskişehir Osmangazi Üniversitesi Dergisi. 88, 93–120.
27. Misati, R.N.,Nyamongo, E.M., 2011. Financial development and private investment in Sub-Saharan Africa. J. Econ. Bus. 63, 139–151.https://doi.org/10.1016/j.jeconbus.2010.10.001.
28. Muyambiri, B., Odhiambo, N.M., 2018. Financial development and investment dymanicsin Mauritius: A trivariate granger causality analysis.SPOUDAI J. Econ. Bus. 68, 62–73

29. Ngongang, E., 2015. Financial development and economic growth in Sub-Saharan Africa: A dynamic panel data analysis. Eur. J. Sustain. Dev. 4, 369–378.https://doi.org/10.14207/ejsd.2015.v4n2p369.
30. Okonah, E. O., 2017. Analysıngtheimpact of fınancıalmarket development on economıcGrowth (Ghana). Adv.Bus.Relat.ScientificRes. J. 8.
31. Özcan, B. ve Arı, A., 2011. Finansal gelişme ve ekonomik büyüme arasındaki ilişkinin ampirik bir analizi: Türkiye örneği. Bus.Econ.Res. J. 2, 121–142.
32. Pagano, M., 1993. Financial markets and growth. Eur. Econ. Rev. 37, 613–622.https://doi.org/10.1016/0014-2921(93)90051-B.
33. Sönmez, F. E., ve Sağlam, Y., 2017. Finansal gelişme ve ekonomik büyüme - Euro bölgesi ve gelişmekte olan Avrupa Ülkeleri Arasında Karşılaştırmalı Bir Analiz. Balıkesir Üniversitesi Sosyal Bilimler Enstitüsü Dergisi. 20, 179–201.
34. Taha, R., Šliogerienė, J., Loganathan, N., Jokšienė, I., Shahbaz, M.,Mardani, A., 2018.Thenexusbetweentaxreformation, financialdevelopmentandeconomicrecovery: Thecase of Malaysia.Technol.Econ. Dev.Economy. 24, 1258–1279.https://doi.org/10.3846/tede.2018.1919
35. Tsaurai, K., 2018. Complementaritybetweenforeignaidandfinancialdevelopment as a driver of economicgrowth in selectedemergingmarkets. ComparativeEconomicResearch. Central andEastern Europe, 21, 45–61.
36. Yahyaoui, A.,Rahmani, A., 2009. Développement financier et croissance economique: Le Rôle de la Qualité des Institutions. Panoeconomicus, 327–357.
37. Yeldan, E., 2003. Liberalization and economic growth relations: Comparison of some Latin American and South East Asian type countries. Doctoral Thesis. Erzurum: Atatürk University Institute of Social Sciences.
38. Yuncu, I.S., 2017. Essays on financial development and economic growth. Doctoral Thesis. Ankara: Bilkent University, Institute of Social Sciences.

Annex1 : Unit Roots Test Results

		Level			First Difference		
	Variable	Intercept	Intercept & trend	None	Intercept	Intercept & trend	None
Benin	GDP	−6,560*	−6,812*	−0,500	−5,191*	−5,141*	−5,201*
	INV	−3,092	−3,346	0,042	−9,010*	−8,931*	−8,990*
	SAVING	−1,373	−3,611	−0,575	−9,258*	−9,219*	−9,215*
	CP	−2,200	−2,558	−0,852	−2,148*	−2,120*	2,180*
	M3	−2,170	−2,230	0,497	−7,660*	−7,586*	−7,600*
	INF	−5,460*	−5,633*	−4,197	−6,629*	−6,565*	6,694*
	FDI	−3,294*	−3,822*	−3,115	−8,988*	−8,938*	−9,090*
	TRADE	−2,661	−2,738	0,220	−6,518*	−6,442*	−6,501*
	GOV	−2,055	−2,038	−0,402	−7,862*	−7,802*	−7,954*
Burkina Faso	GDP	−7,444*	−8,341*	−0,656	−9,503*	−9,401*	−9,795*
	INV	−3,408	−3,418	0,148	−7,031*	−6,932*	−7,063*

	SAVING	−1,436	−1,757	−0,371	−7,490*	−7,596*	−7,514*
	CP	−0,428	−0,909	1,552	−4,829*	−4,785*	−4,640*
	M3	0,634	−0,874	2,403	−6,770*	−6,902*	−6,157*
	INF	−4,561*	−5,109*	−3,220*	−6,253*	−6,197*	−6,327*
	FDI	2,462	−4,170*	3,090	−9,993*	−5,876*	−10,093*
	TRADE	1,255	−1,497	1,255	−5,748*	−5,700*	−5,619*
	GOV	−2,045	−1,703	−0,197	−7,182*	−7,325*	−7,232*
Ghana	GDP	−4,767*	−5,551*	−2,833*	−7,787*	−7,685*	−7,889*
	INV	−1,824	−2,765	−0,275	−6,633*	−6,525*	−6,582*
	SAVING	−2,399	−2,448	−1,134	−8,410*	−8,535*	−8,489*
	CP	−1,303	−2,321	−0,338	−7,196*	−7,198*	−7,310*
	M3	−1,996	−2,583	−0,214	−7,523*	−7,427*	−7,601*
	INF	−5,541	−5,752*	−1,804*	−7,445*	−7,442*	−7,548*
	FDI	−1,442	−2,733	−0,883	−5,810*	−5,570*	−5,586*
	TRADE	−1,551	−1,945	−0,226	−5,883*	−5,859*	−5,902*
	GOV	−3,998-	−4,018-	−0,913	−7,430*	−7,332*	−7,508*
Niger	GDP	−6,014*	−6,727*	−5,108*	−9,053*	−8,942*	−9,147*
	INV	−1,613	−2,095	0,022	−7,484*	−7,400*	−7,458*
	SAVING	−2,824	−3,318	−0,967	−8,016*	−4,610*	−8,074*
	CP	−1,915	−1,809	0,172	−6,251*	−6,206*	−6,257*
	M3	−1,294	−1,491	−0,193	−5,020*	−5,000*	−5,059*
	INF	−6,747*	−7,211*	−5,161*	−9,361*	−9,225*	−9,427*
	FDI	−1,630	−2,039	−1,212	−6,473*	−6,405*	−6,520*
	TRADE	−2,103	−2,314	−0,216	−6,731*	−6,775*	−6,795*
	GOV	−1,849	−1,597	0,236	−7,638*	−7,775*	−7,614*
Sierra Leone	GDP	−5,544*	−5,832*	−5,231*	−6,037*	−5,942*	−6,140*
	INV	−2,575	−3,511	−1,301	−5,744*	−5,705*	−5,826*
	SAVING	−1,479	−2,362	−1,521	−10,330*	−10,207*	10,361*
	CP	−2,292	−2,420	−1,155	−6,374*	−6,571*	−6,448*
	M3	−1,741	−1,645	0,455	−6,317*	−6,312*	−6,404*
	INF	−1,431*	−4,007*	−0,959*	−5,650*	−5,080*	−5,147*
	FDI	−3,870*	−4,219*	−3,577*	−8,959*	−8,830*	−9,082*
	TRADE	−2,389	−2,971	−0,785	−6,977*	−6,910*	−7,079*
	GOV	−2,936	−3,194	−0,435	−7,810*	−7,740*	−7,907*
Togo	GDP	−6,821*	−6,834*	−5,393*	−11,935*	−11,801*	12,064*
	INV	−2,602	−2,591	−0,650	−6,691*	−6,613*	−6,762*
	SAVING	−3,497*	−4,316*	−2,165*	−11,860*	−11,818*	11,970*
	CP	−1,232	−1,435	0,595	−7,508*	−7,430*	−7,382*
	M3	−0,416	−0,807	−1,383	−7,242*	−7,229*	−6,917*
	INF	−8,301*	−9,129*	−6,147*	−10,912*	−10,804*	11,036*
	FDI	−5,069*	−5,154*	−4,304*	−10,991*	−10,894*	11,111*

	TRADE	−2,346	−2,431	−0,599	−7,340*	−7,270*	−7,417*
	GOV	−2,701	−2,906	−0,426	−8,577*	−6,628*	−8,624*

Note: * denotes stationarity at the 5% level. The definitions of the abbreviations are as follows: GDP: Gross domestic product; INV: Investment; SAVING: Savings; CP: Credit to the private sector; M3: Money supply; INF: Inflation; FDI: Foreign direct investment; TRADE: Foreign trade; GOV: General government final expenditure

Annex 2 GrangerCausality test Burkina faso

GrangerCausality test Burkina faso			
NullHypothesis:	Obs	F-Statistic	Prob.
D(CP) does not GrangerCause D(INV)	47	2.14633	0.1500
D(INV) does not GrangerCause D(CP)		0.72391	0.3995
D(M3) does not GrangerCause D(INV)	47	0.95663	0.3334
D(INV) does not GrangerCause D(M3)		1.02025	0.3180
D(GOV) does not GrangerCause D(INV)	47	0.02962	0.8641
D(INV) does not GrangerCause D(GOV)		0.73631	0.3955
D(FDI does not GrangerCause) D(CP)	47	3.05871	0.0873
D(CP) does not GrangerCause D(FDI)		1.52487	0.2234
D(TRADE) does not GrangerCause D(M3)	47	0.39108	0.5350
D(M3) does not GrangerCause D(TRADE)		3.99126	0.0519
D(FDI) does not GrangerCause D(M3)	47	0.35186	0.5561
D(M3) does not GrangerCause D(FDI)		0.54748	0.4633
D(SAVING) does not GrangerCause D(GOV)	47	0.71373	0.4028
D(GOV) does not GrangerCause D(SAVING)		2.10281	0.1541
D(FDI) does not GrangerCause D(GOV)	47	2.34999	0.1324
D(GOV) does not GrangerCause D(FDI)		1.73549	0.1945
D(SAVING) does not GrangerCause D(TRADE)	47	9.65207	0.0033
D(TRADE) does not GrangerCause D(SAVING)		0.02663	0.8711
D(FDI) does not GrangerCause D(TRADE)	47	0.01253	0.9114
D(TRADE) does not GrangerCause D(FDI)		3.71995	0.0602

Note: Thenullhypothesis is rejected at a 1%, 5% and 10% level

Annex 3 GrangerCausality test Benin

GrangerCausality test Benin			
NullHypothesis:	Obs	F-Statistic	Prob.

D(CP) does not GrangerCause D(INV)	47	2.41945	0.1270
D(INV) does not GrangerCause D(CP)		3.53589	0.0667
D(GOV) does not GrangerCause D(INV)	47	3.3E-06	0.9986
D(INV) does not GrangerCause D(GOV)		0.02184	0.8832
D(FDI) does not GrangerCause D(INV)	47	0.17510	0.6777
D(INV) does not GrangerCause D(FDI)		0.01372	0.9073
D(TRADE) does not GrangerCause D(INV)	47	5.27305	0.0265
D(INV) does not GrangerCause D(TRADE)		4.56707	0.0382
D(GOV) does not GrangerCause D(CP)	47	1.28090	0.2639
D(CP) does not GrangerCause D(GOV)		1.19774	0.2797
D(FDI) does not GrangerCause D(CP)	47	0.67407	0.4161
D(CP) does not GrangerCause D(FDI)		0.51815	0.4754
D(TRADE) does not GrangerCause D(CP)	47	2.06437	0.1579
D(CP) does not GrangerCause D(TRADE)		7.50991	0.0088
D(FDI) does not GrangerCause D(GOV)	47	1.67637	0.2022
D(GOV) does not GrangerCause D(FDI)		0.04508	0.8328
D(TRADE) does not GrangerCause D(GOV)	47	0.45388	0.5040
D(GOV) does not GrangerCause D(TRADE)		0.97420	0.3290
D(TRADE) does not GrangerCause D(FDI)	47	0.37048	0.5459
D(FDI) does not GrangerCause D(TRADE)		0.37978	0.5409

Note: Thenullhypothesis is rejected at a 1%, 5% and 10% level

Annex4 : Grangercausality test Sierra Leone

NullHypothesis:	Obs	F-Statistic	Prob.
D(CP) does not GrangerCause D(INV)	37	7.77444	0.0086
D(INV) does not GrangerCause D(CP)		0.03951	0.8436
D(SAVING) does not GrangerCause D(INV)	37	0.00031	0.9860
D(INV) does not GrangerCause D(SAVING)		0.20814	0.6511
D(M3) does not GrangerCause D(INV)	37	4.59356	0.0393
D(INV) does not GrangerCause D(M3)		0.11121	0.7408
D(GOV) does not GrangerCause D(INV)	37	0.00176	0.9668
D(INV) does not GrangerCause D(GOV)		0.71532	0.4036
D(TRADE) does not GrangerCause D(INV)	37	3.74128	0.0614
D(INV) does not GrangerCause D(TRADE)		2.81199	0.1027
D(SAVING) does not GrangerCause D(CP)	37	0.35787	0.5537
D(CP) does not GrangerCause D(SAVING)		5.72984	0.0223
D(M3) does not GrangerCause D(CP)	37	0.11504	0.7366
D(CP) does not GrangerCause D(M3)		1.97935	0.1685
D(GOV) does not GrangerCause D(CP)	37	0.08382	0.7739

D(CP) does not GrangerCause D(GOV)		0.85213	0.3625
D(TRADE) does not GrangerCause D(CP)	37	0.03377	0.8553
D(CP) does not GrangerCause D(TRADE)		3.56250	0.0677
D(M3) does not GrangerCause D(SAVING)	37	0.58780	0.4486
D(SAVING) does not GrangerCause D(M3)		0.58529	0.4495
Note: Thenullhypothesis is rejected at a 1%, 5% and 10% level			

Annex 5 :Grangercausality test Ghana

Grangercausity testGhana			
NullHypothesis:	Obs	F-İstatistiği	Prob
D(SAVING) does not GrangerCause D(INV)	40	0.75953	0.3891
D(INV) does not GrangerCause D(SAVING)		6.31907	0.0164
D(CP) does not GrangerCause D(INV)	40	0.03310	0.8566
D(INV) does not GrangerCause D(CP)		0.49824	0.4847
D(M3) does not GrangerCause D(INV)	40	0.17697	0.6764
D(INV) does not GrangerCause D(M3)		0.43897	0.5117
D(M3) does not GrangerCause D(SAVING)	40	0.32261	0.5735
D(SAVING) does not GrangerCause D(M3)		0.38142	0.5406
D(FDI) does not GrangerCause D(SAVING)	40	0.72856	0.3988
D(SAVING) does not GrangerCause D(FDI)		5.97638	0.0194
D(M3) does not GrangerCause D(CP)	40	3.73256	0.0610
D(CP) does not GrangerCause D(M3)		0.35004	0.5577
D(FDI) does not GrangerCause D(CP)	40	0.56329	0.4577
D(CP) does not GrangerCause D(FDI)		0.01145	0.9154
D(TRADE) does not GrangerCause D(CP)	40	1.52827	0.2242
D(CP) does not GrangerCause D(TRADE)		0.06446	0.8010
D(TRADE) does not GrangerCause D(M3)	40	1.56066	0.2194
D(M3) does not GrangerCause D(TRADE)		0.54684	0.4643
D(TRADE) does not GrangerCause D(FDI)	40	4.36163	0.0437
D(FDI) does not GrangerCause D(TRADE)		0.08875	0.7674

Note: Thenullhypothesis is rejected at a 1%, 5% and 10% level

Annex6 :Grangercausality test Niger

GrangerCausality Test Niger			

NullHypothesis:	Obs	F-Statistic	Prob.
D(CP) does not GrangerCause D(INV)	47	0.15578	0.6950
D(INV) does not GrangerCause D(CP)		2.66076	0.1100
D(M3) does not GrangerCause D(INV)	47	4.24704	0.0453
D(INV) does not GrangerCause D(M3)		3.20345	0.0804
D(TRADE) does not GrangerCause D(INV)	47	9.27032	0.0039
D(INV) does not GrangerCause D(TRADE)		0.46398	0.4993
D(GOV) does not GrangerCause D(SAVING)	47	0.56160	0.4576
D(SAVING) does not GrangerCause D(GOV)		2.94146	0.0934
D(FDI) does not GrangerCause D(CP)	47	0.00228	0.9622
D(CP) does not GrangerCause D(FDI)		0.03831	0.8457
D(TRADE) does not GrangerCause D(CP)	47	0.19909	0.6576
D(CP) does not GrangerCause D(TRADE)		11.2492	0.0016
D(GOV) does not GrangerCause D(M3)	47	0.29073	0.5925
D(M3) does not GrangerCause D(GOV)		0.07595	0.7841
D(FDI) does not GrangerCause D(M3)	47	0.85244	0.3609
D(M3) does not GrangerCause D(FDI)		0.18277	0.6711
D(TRADE) does not GrangerCause D(M3)	47	0.85380	0.3605
D(M3) does not GrangerCause D(TRADE)		4.11521	0.0486

Note: Thenullhypothesis is rejected at a 1%, 5% and 10% level

Annex 7 : Grangercausality test Togo

NullHypothesis:	Obs	F-Statistic	Prob.
D(CP) does not GrangerCause D(INV)	47	0.27329	0.6038
D(INV) does not GrangerCause D(CP)		9.09915	0.0042
D(M3) does not GrangerCause D(INV)	47	0.38717	0.5370
D(INV) does not GrangerCause D(M3)		0.64411	0.4265
D(GOV) does not GrangerCause D(INV)	47	2.58788	0.1148
D(INV) does not GrangerCause D(GOV)		10.9283	0.0019
D(TRADE) does not GrangerCause D(INV)	47	3.01147	0.0897
D(INV) does not GrangerCause D(TRADE)		1.04733	0.3117
D(M3) does not GrangerCause D(CP)	47	1.31757	0.2572
D(CP) does not GrangerCause D(M3)		0.11973	0.7310
D(GOV) does not GrangerCause D(CP)	47	0.58579	0.4481
D(CP) does not GrangerCause D(GOV)		0.02660	0.8712
D(TRADE) does not GrangerCause D(CP)	47	3.14832	0.0829
D(CP) does not GrangerCause D(TRADE)		0.48504	0.4898

D(GOV) does not GrangerCause D(M3)	47	3.18170	0.0814
D(M3) does not GrangerCause D(GOV)		2.72776	0.1057
D(TRADE) does not GrangerCause D(M3)	47	1.07925	0.3045
D(M3) does not GrangerCause D(TRADE)		0.02198	0.8828
D(TRADE) does not GrangerCause D(GOV)	47	11.3629	0.0016
D(GOV) does not GrangerCause D(TRADE)		6.55095	0.0140

Note: Thenullhypothesis is rejected at a 1%, 5% and 10% level