The Impact of Remittances and Financial Development on Economic Growth in ECOWAS Region

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Abstract
This study re-examined the relationship between remittances, financial development, and economic growth in 13 ECOWAS countries. The model was built using the System GMM estimator. According to the estimated results, remittances have a considerable negative influence on economic growth in the short term but a significant favorable impact in the long run. Financial development was found to be minimal in determining economic growth in the ECOWAS sub-region, contrary to expectations. This may be due to the fact that the financial sector, particularly the banking system, invests funds deposited by domestic and international customers in short-term, less risky investments like treasury bills and treasury certificates rather than investing in or lending to the real sector like agriculture and manufacturing. As a result, this research suggests that remittances are a significant source of economic growth in the ECOWAS sub-region, whereas financial development is not a significant driver of economic growth. In the ECOWAS sub-region, however, the combination of remittances and financial development is critical for both short- and long-term growth. The outcome suggests that remittances and financial development can be combined to enhance economic growth in a variety of ways.

Keywords: Financial development; Remittances; Economic growth; ECOWAS; GMM estimation

1. Introduction
The sources of economic growth in developed economies have been the point of contention for more than half a century (Solow, 1956). Human capital development, foreign direct investment, investment in physical capital, surplus labour, technological change, foreign aid, etc., have all been noted as causes of economic growth. Other authors, such as Owens (1987), Sen (1990), and Kaufmann, Kray, and Mastruzzi (2006), have focused on how institutions affects economic growth. Remittances, on the other hand, account for a significant portion of international capital flows in many developing nations, topping foreign aid, export revenue and FDI (Giuliano & RuizArranz, 2005). According to Blouchoutzi and Nikas (2014), remittances are the essential benefits and monetary rewards that emigrant countries receive as a result of losing a portion of their labor force. Remittances have been conceived as one of the less difficult, efficient and fastest ways of sending money over the globe (Imai, Gaiha, & Garbero, 2014). According to the 2015 International Migration Report, over 244 million people migrated around the world in 2015, from this number, 58% migrated to developed regions while 42% migrated to less developed countries.

In 2018, there were an estimated 266 million international migrants and refugees, with 240 million (90%) being economic migrants (World Bank, 2019). Around 46% of migrants from developing nations moved to countries with high level of economic growth and development; nevertheless, the percentage of migrants from developing...
nations travelling to other developing nations was higher than the share travelling to the "North" as designated by OECD countries with high level of economic growth (World Bank, 2019).

In the same way, remittances inflows from international migration have been on the increase. For instance, in 2001, $96.5bn worth of remittances flowed to developing countries, from this, Africa received $14 billion, this soared to $331.7 billion in 2010, with Africa receiving $40 billion; it increased to $416.6 billion in 2013, $429.9bn in 2014, and $432bn in 2015, with Africa receiving $52bn (Ratha, 2016). Remittances have also hugely propelled economic performance of West African countries (henceforth referred to as ECOWAS). This is as a result of the increase in migration in the region. For example, Nigeria was ranked 6th in 2015, one of the top ten remittance recipients in the world, with about $20.8bn (Ding et al., 2021). Between 2011 and 2015, this contributed to Nigeria's GDP by 4.4%, Nigeria’s GDP (total) growth rate for the same period stood at 6.8 per cent (World Development Indicators, 2017). Nigeria dominated African beneficiaries with $22.3 billion in 2017, maybe as expected given its population and economy (Ding & Vitenu-Sackey, 2021). When remittances inflows to the ECOWAS region are looked as a percentage of GDP, Gambia has the highest share in 2018, preceded by Cabo Verde and Liberia. In 2017, remittances accounted for 25.9% of Liberia's GDP, making it the African country with the largest remittance share (Ding & Vitenu-Sackey, 2021). Senegal received over $16bn worth of remittances in 2011, this contributed to the country’s GDP growth rate by 1.8 percent, which was more than Mali in the same year, earned only $7bn from remittances with a higher GDP contribution of 3.2 per cent (World Development Indicators, 2015).

In 2019, remittances inflows to poor and advancing countries totaled $501 billion, an increase of 4.7 percent from 2018, making it the world's largest source of external financing for developing countries(). Improved economic conditions in industrialized countries, mainly the United States, where many of the region's migrants make their living, have propelled the increasing trend since 2016. Furthermore, remittance flows are projected to keep rising in the ECOWAS region as a result of large intra-regional migration patterns and forecasted strong growth expansion (Vitenu-Sackey & Hongli, 2019a).

Furthermore, the lowest remittance growth was recorded in 2015, due to the 2008-2009 financial crises that occurred globally (Vitenu-Sackey, 2020a; Vitenu-Sackey & Bathuure, 2020; Xinying et al., 2019). According to a World Bank report released in 2019, official remittances to poor countries totaled $431.6 billion in 2015, 0.4% increase from $430bn in 2014. Since the global financial crisis, the increase rate in 2015 was the weakest. Remittances inflows around the globe, coupled with those that flowed to high-income countries, fell by 1.7 percent in 2015, from $592 billion in 2014 to $581.6 billion. In 2015, the main causes for the reduced remittance inflows to economies that depend so much on remittances as a major source of capital was attributed to economic challenges (Vitenu-Sackey & Hongli, 2020b; Vitenu-Sackey & Alhassan, 2019; Vitenu-Sackey, 2020c). Due to the world shutdown of economies linked to COVID-19 pandemic, the predicts a decrease in remittance flows across all regions: Europe and Central Asia 27.5%, 23.1% in Sub-Saharan Africa, 22.1% in South Asia, 19.6% in the Middle East and North Africa, 19.3% in Latin America and the Caribbean, and 13% in East Asia and the Pacific.

What factors determine a country's ability to profit from remittances received from migrants?

The recipient's country's degree of financial development is a natural contender for making remittances effective for growth. As is generally known, one of the greatest impediments to entrepreneurship in developing countries is lack of access to credit (Rapoport & Docquier, 2005). Furthermore, remittances inflows are seen as catalyst for the development of the financial systems in the nations of beneficiaries, and this has been found to drastically reduce poverty level, inequality reduction, and boost economies of the recipients (Vitenu-Sackey et al. 2019; Yushang et al. 2019).

Remittances inflows can help a country prosper by serving as an alternative for (Giuliano & Ruiz-Arranz, 2005) or a complement to (Aggarwal et al., 2006) financial system. It is considered that a positive link between remittances inflows and financial system advancement works in two ways. To start with, remittances

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raise demand for financial services, whether they are sent or saved. Also, remittances provide an alternate source of funding for entrepreneurs who are unable to obtain loans from the banks. As the time progress, these businessmen may progress to a bigger stage, thereby putting banks into competition (Giuliano & Ruiz-Arranz, 2005). However, if the remaining communities develop a remittance reliance syndrome and become unproductive owing to moral hazard, the opposite of the second channel may occur (De Haas, 2007).

Domestic loans availability to the private sector (% of GDP), money supply indicators, and stock market indices among other macroeconomic variables, are used to measure financial development, or financial depth. On other hand, as recommended by the Group of 20 countries (G20), financial inclusion – its most likely cousin – is measured by three qualitative dimensions, namely: (i) financial services accessibility; (ii) financial services usage; and (iii) product and service quality. Financial development, could be said, is a requirement for financial inclusion. As a result, financial development is required in order to gain access to financial services (Hongli & Vitenu-Sackey, 2019c; Hongli & Vitenu-Sackey, 2019b).

Economic progress in developing economies is facilitated by the viability functionality of the financial sector by directing these huge savings into productive investments (Levine, 2003). The foundation of this concept is Schumpeter's (1911) pioneering evidence on the role that the financial sector advancement plays on economic growth, which claims that a financial system that functions optimally will enhance technological innovation by efficiently allocating resources from inefficient sectors to sectors that are efficient and productive.

The World Bank, refers to financial sector as the body of institutions, markets, as well as the legal entities that allow for credit-based transactions. Financial sector development is considered to have happened when these financial components reduce transaction costs and so perform a better job of critical economic services for the financial sector (World Bank Report, 2016). The financial sector, as put forward by the, is the brain of the economy, allocating resources to the most efficient and productive uses when it is functioning properly. Contemporary growth theories have acknowledged the role of finance in savings and capital accumulation (Romer, 1986; Romer, 1990; Grossman & Helpman, 1991 and Pagano, 1993).

In any country or region, an effective intermediation process and enhanced financial sector enhances domestic savings and also enhances monetary policy efficacy by channeling limited financial resources to the most important economic decisions' investments (Tchamyou, 2020). Some benefits of financial system that functions adequately, includes the facilitation of access to credit by domestic companies, embracing technological advancement, attract skilled labor, and alleviating foreign companies' credit constraints, as well as the ability to guide foreign direct investment (Jalilian & Kirkpatrick, 2007; Odhiambo, 2010). It is critical to emphasize that the advancement of the financial system does not only propel investment activities, it also enables the poor to increase their human and physical capital due to its resource redistribution capacity (Tchamyou, Erreygers, & Cassimon, 2019).

Over the last few decades, so many economic reforms have been put in place by African countries, which are aimed at increasing the advancement of their financial systems by establishing policies targeted at promoting the growth and advancement of a financial system capable of supporting growth potentials and development via accelerated investments. Before 1983, government banks dominated Ghana's financial sector, including the Ghana Commercial Bank, the Agricultural Development Bank, and a few others. Because competition was scarce, it was assumed that financial system liberalization and globalization would bring it about (Bawumia, 2010). Nigeria's financial sector reforms began in August 1987, when interest rates were deregulated. Since then, far-reaching policy changes have been implemented, including the creation of new banks, capital market reform, and a shift from direct to indirect fiscal controls. The restrictions for granting new bank licenses have been loosened as a result of interest rate deregulation. As a result, the number of banks that was 40 1986 rose dramatically to 119 in 1991 (Ikhide & Alawode, 2011). These reforms and policies aimed at encouraging

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financial development have been invoking across the ECOWAS sub-region. However, the results from the implementation of the reforms across the region have not performed so well.

The financial sector development of the ECOWAS region is still in its early stages, as evidenced by the difficulties faced by households and organizations in acquiring credit. According to Alfaro, Chanda, Kalemli-Ozcan, and Sayek (2004), a lack of finance sector growth, whether in terms of market or institutional factors, limits an economy's potential to gain from FDI spillovers. Due to the low level development of the financial system, different capital inflows to the region and their benefits may also be affected. Therefore, it becomes imperative to ascertain how the financial sector impacts on the remittances-economic growth nexus.

2. Theoretical framework

The central claim of Harrod-two-gap Domar's model is that majority of the emerging countries confront either a lack of domestic savings to equal investment or a lack of international savings to match investment (Todaro and Smith, 2012). External financing (grants, loans or remittances) can be extremely helpful in supplementing domestic savings and overcoming foreign exchange hurdles, according to the two-gap postulation on foreign assistance. The Harrod-Domar growth model of saving-investment theoretical gap framework that was popularized by Chenery and Strout (1966) is used in this study.

Saving equals investment at all times under the two-gap theory, as follows:

\[ S_t = I_t \]  

(1)

In actuality, actual saving in the ECOWAS region is frequently less than investment (saving gap); so, external finances such as remittances can be used to supplement the inadequate saving capacity: hence model 1 is re-specified as:

\[ S_t + remit_t = I_t \]  

(2)

Since capital stock depends on saving, the capital stock equation can then be written as:

\[ K_t = S_t + remit_t + (1 - \delta)K_{t-1} \]  

(3)

The Cobb-Douglas production function, is defined as follows:

\[ Y_t = AL_t^{1-a}K_t^a \]  

(4)

\( Y_t \) stands for gross domestic product (GDP); \( A \) represent technology-taken as given; \( L_t \) represent labour and \( K_t \) is the stock of capital.

This can be expressed in terms of per capita, Equation (4) can be stated as:

\[ \frac{Y_t}{L_t} = \frac{AL_t^{1-a}K_t^a}{L_t} = A\left(\frac{K_t}{L_t}\right)^a \]  

(5)

When written in intensive form, Eq. (5) becomes:

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\[ y = Ak^\alpha \]  
Here, \( y = Y/L, k = K/L \)

### 3. Model Specification and Method of estimation

#### 3.1 Model specification

In examining the influence of remittances and financial development on economic growth in the selected ECOWAS regional countries, this study follows the argument that remittances are spent on productive and capital stock accumulation in the majority of cases, as shown by equation (3) and prior studies such as Guiliano and Ruiz (2009) and Freund and Spatafora (2008). As a result, equation (6) can be written as follows:

\[ y = \text{Aremmit}^\alpha \]  
When eq. (7) is log linearized we have:

\[ \ln y = A + \alpha \ln \text{remmit} \]  

#### 3.1.1 Models

The equation below is specified to determine the relationship between remittances and economic growth, financial development and economic growth, and the influence of financial development on the relationship between remittances and economic growth in the ECOWAS sub-region, by using equation (8) and adding financial development and other control variables:

\[ \ln y = A + \alpha_1 \ln \text{remmit} + \alpha_2 \ln \text{find} + \alpha_3 \ln \text{top} + \alpha_4 \ln \text{pop} + \alpha_5 \text{fdi} + \alpha_6 \ln \text{remmit} \cdot \ln \text{find} \]  

when Eq. (9) is rewritten in a panel-econometric form, we get:

\[ \ln y_{it} = A + \alpha_1 \ln y_{it-1} + \alpha_2 \ln \text{remmit}_{it} + \alpha_3 \ln \text{find}_{it} + \alpha_4 \ln \text{top}_{it} + \alpha_5 \ln \text{pop}_{it} + \alpha_6 \text{fdi}_{it} + \alpha_7 \ln \text{remmit} \cdot \ln \text{find}_{it} + a_i + \varepsilon_{it} \]  

Here;

- \( A \) represents the constant term;
- \( a_i \) is the individual heterogeneity;
- \( \varepsilon_{it} \) stands for error term;
- \( y_{it} \) is log of output per labour; \( \text{remmit} \) is personal remittances received by each country; \( \text{find} \) is financial development, proxied by broad money supply; \( \text{top} \) is trade openness; \( \text{pop} \) is the population growth; \( \text{fdi} \) is foreign direct investment; \( y_{it-1} \) is the lag of GDP.

In equation (10), \( y \) signifies productivity per labor in log units, remmit denotes personal remittances received by each country (% of GDP), and find denotes financial system development, and so on. And, unlike many other analyses, Hongli & Vitenu-Sackey (2020a), Goschin (2013), Kumar and Vu (2014), Meyer and Shera (2013), and Akonji and Wakili (2013), this one uses broad money supply to GDP rather than private sector...
credits to GDP. The term "broad money" refers to all of a country's cash stored outside of banks, including demand deposits, savings accounts, time deposits, and foreign currency deposits. Apart from the fact that some past studies have used broad money supply to GDP as a degree of financial development, another factor that influences the choice of broad money to GDP over private sector credit to GDP is the fact that broad money as a percentage of GDP has a significantly higher composition than private sector credit as a percentage of GDP, and other proxies. Also, top means trade openness, pop represents population growth and fdi implies foreign direct investment. a1, a2, a3, a4, a5, a6, a7 and a8 represents the coefficients of the variables employed. Trade openness relates to the selected nations' trading activity, and it represents the degree of inward or outward orientation of those nations' trading activity. In this study, trade openness is measured by the share of trade to GDP for respective country. As a result of globalization and trade liberalization policies, this indicator has increased for the majority of the ECOWAS nations. While population growth refers to the increase or decrease in the population of a country. Finally, in the selected ECOWAS countries, foreign direct investment is a crucial predictor of growth. Equation (10) is denoted as model (1).

3.2 Method of Estimation

GMM is an estimator that happens to be naturally well suited to deal with potential endogeneity issues. Hansen (1982) proposed the Generalized Method of Moments (GMM). The orthogonality conditions are used by GMM to accommodate for capable estimation in the existence of unknown form heteroscedasticity. The GMM method is adopted because it is appropriate for the data set. It's suitable for studies with "small T, large N" panels, which have limited amount of time periods but a large number of individuals, like in the case of this study; 13 countries with a period of 9 years (2010 to 2018). Hence, the GMM estimation is carried out in this study as follows:

Letting:

\[ Y_{it} = (\text{ln}gd{p_{it}})' \]

represent \( NT \times 1 \) vector of regressand;

\[ X'_{it} \]

be a \( 2 \times G \) vector of regressors, i.e., \( (\text{lnremitt}_{it}, \text{lnfind}_{it})' \);

\( \beta \) is a \( G \times 2 \) vector of parameters to be estimated;

\( W_{it} \) is a \( 3 \times G \) vector of control variables, i.e., \( \text{ln}top + \text{ln}pop + \text{fdi} \) \( \Delta \) is a \( G \times 3 \) vector of parameters to be estimated

Where remmit is personal remittances received by each country; find represent financial development; top represent trade openness; pop is the population growth; fdi is foreign direct investment.

Hence, the Cobb Douglas production function is specified as follows:

\[ Y_{it} = f(X'_{it}\beta, W_{it}) \]  

(11)

From equation (12), we take the natural logarithm, and introduce unobserved country-specific effects \( \pi_i \), time dummies \( \lambda_i \)-time dummies are added to remove universal time-related shocks from the errors, the interactive terms remmit * find. The measurement error is represented by \( \varphi_{it} \).

Therefore, we have:

\[ \ln Y_{it} = \rho Y_{it-1} + \ln X_{it}\beta_{\rho} + \ln W_{it}\Delta_{s} + a\ln\text{remitt}_{it} + \ln\text{find}_{it} + \lambda_i + (\pi_i + \epsilon_{it}) \]  

(12)

The term \( \ln X_{it}\beta_{\rho} \) is hence a \( 2 \times 2 \) log matrix of variables and parameters, also, \( \ln W_{it}\Delta_{s} \) is now a \( 3 \times 3 \); \( \beta_{\rho} = 1, 2; \Delta_{s} = 1, 2, 3, \ldots, 4; \)

\( it, \varphi_{it} \sim MA(0) \).
Getting consistent estimate of $\beta$ when $N > T$ is the goal, holding that $\text{cov}(X_{it}, \pi_i, \varphi_{it}) \neq 0$, implying that all the regressors are respectively correlated with country-specific effects and measurement errors.

To remove the country-specific effects in equation (13), first difference is applied thus:

$$\ln Y_{it} - \ln Y_{it-1} = \rho Y_{it-1} - \rho Y_{it-2} + \ln X_{it} \beta - \ln X_{it-1} \beta + \ln W_{it} \varepsilon_{it} - \ln W_{it-1} \varepsilon_{it} + \text{alnremit} * \ln \text{ind}_{it-1} + \lambda_t + \pi_i - \pi_i + \varepsilon_{it} - \varepsilon_{it-1}$$

(13)

So that $\text{cov}(X_{it}', \varepsilon_{it}) = 0$ and $\text{cov}(X_{it}', \varepsilon_{it-1}) = 0$

Nevertheless, notwithstanding the first differencing, the problem of endogeneity remains because $\text{cov}(Y_{it}, \varepsilon_{it-1}) \neq 0$, i.e. $Y_{it}$ is correlated with the past errors in $\Delta \varepsilon_{it}$ and probably present errors $\varepsilon_{it}$. Additionally, $E(\pi_i) = E(\varepsilon_{it}) = E(\varepsilon_{it}, \pi_i) = 0; E(\varepsilon_{it}, \varepsilon_{it}) = 0$.

Arellano and Bond (1991) propose a Generalized Method of Moments estimator that uses all available lags in levels to instrument differenced variables that are not strictly exogenous. They also devised a test for autocorrelation that can render some lags invalid as instruments if it exists. Lagged levels are poor instruments for first differences if the variables are close to a random walk, which is a problem with the original Arellano-Bond estimator. Instead of first differencing, forward orthogonal deviations transformation will be used. Instead of subtracting the previous observation, the orthogonal deviations introduced by Arellano and Bover (1995) subtract the average of all possible future data. It can be computed for all observations save the last for each individual, regardless of how many gaps occur, so data loss is minimized. Therefore, equation (10) which is the model for objectives One, Two and three is specified as:

$$\Delta \ln Y_{it} = \rho \Delta \ln Y_{it-1} + \ln \Delta X_{it} \beta + \ln \Delta W_{it} \gamma_i + \text{alnremit} * \ln \text{ind}_{it-1} + \lambda_t + \Delta \varepsilon_{it}$$

(14)

Where

$Y_{it-1}$ is the lag of the dependent variable, $\ln GDP$;
$X'$ is a vector of explanatory variables, i.e., $(\ln \text{remit}_{it}, \ln \text{ind}_{it})'$;
$W'$ is a vector of control variables, i.e., $(\ln \text{top}, \ln \text{pop}, \text{fdi})$;
$\text{remit} \ast \text{ind}$ is the interactive term;
$\lambda_t$ is the time dummy; and $\varepsilon_{it}$ is the error term.

- **Levels**

Assuming that $E[\Delta X_{it}, \pi_i] = E[\Delta W_{it}, \pi_i] = 0$, and that $E[\Delta y_{it}, \pi_i] = 0$ satisfies initial conditions, then the additional moment conditions can be obtained as follows:

$$E[\Delta X_{it-s}(\pi_i^* + W_{it})] = 0$$

(15)

for $s = 1$ when $W_{it} \sim MA(0)$, and for $s = 2$ when $W_{it} \sim MA(0)$ (Arellano and Bover, 1995). As a result, properly lagged first differences of the variables can be used as level equation instruments. In a system with both first-differenced and levels equations, both sets of moment requirements can be employed to generate a linear GMM estimator. By merging the two sets of moment conditions, the system GMM estimator is generated.

- **Diagnosis**

Based on system GMM, and in order to check for the suitability of the instrument sets used, post-estimation diagnostic tests - Arellano and Bond (1991) tests for second-order autocorrelation are performed, as well as the Sargan–Hansen J-test for overidentifying restrictions.

### 3.3 Data Source

This study sampled 13 countries from the ECOWAS region for the period of 2010 to 2018. The countries are: Benin, Burkina Faso, Cabo Verde, Nigeria, Côte d’Ivoire, Ghana, Guinea, Guinea Bissau, Mali, Niger, Togo,
Senegal, and Sierra Leone. They were selected based on evidence of large inflows of remittances throughout the specified time span. Because of the significant growth in immigrants and remittances received throughout that time, the study period was set from 2010 to 2018. According to the International Migration Report, 2015, 4.65 million migrants were reported yearly between 2000 and 2015, related to 2.0 million migrants between 1990 and 2000. Again, the period, 2010-2018 was also considered in order to ascertain if remittances have fared so well in the ECOWAS sub-region, which is the period between two global crises, namely: The Great Recession (also known as the Global Financial Crisis) and the COVID-19 Pandemic.

Table 3.1 shows the definitions and measurements of the variables utilized in the analysis. It’s worth noting that GDP is used to scale variables like remittances and money supply to take into account the countries' relative economic differences. The impacts of remittances on growth have been determined to be either positive or negative based on a priori expectations, both theoretically and empirically. Financial development is anticipated to have a progressive influence on growth since a developed financial market has a significant role on economic growth. When countries have almost nothing to contribute to the global economy and gain from it, trade openness is projected to have a favorable or negative impact on economic growth in the selected ECOWAS countries. Lastly, the fact that foreign direct investment (FDI) can boost domestic growth by transferring technology, but it can also drive out domestic investors due to intense competition. Furthermore, eviews9 and Stata 15.1 econometric software was employed for the analyses.

Table 3.1: Description of Variables, Sources and Measurement

<table>
<thead>
<tr>
<th>Definition</th>
<th>Unit of Measurement</th>
<th>Expected Sign</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>gdp</td>
<td>Gross Domestic Product (per labour)</td>
<td>$\frac{GDP}{labour}$</td>
<td>Positive/Negative</td>
</tr>
<tr>
<td>remmit</td>
<td>Personal remittances</td>
<td>Personal remittances (GDP in %)</td>
<td>Positive/Negative</td>
</tr>
<tr>
<td>find</td>
<td>Broad Money Supply</td>
<td>M2 (% of GDP)</td>
<td>Positive</td>
</tr>
<tr>
<td>fdi</td>
<td>Foreign direct investment</td>
<td>FDI (% of GDP)</td>
<td>Positive/Negative</td>
</tr>
<tr>
<td>top</td>
<td>Trade Openness</td>
<td>$\frac{Export + Import}{GDP} *100$</td>
<td>Positive</td>
</tr>
<tr>
<td>pop</td>
<td>Population Growth</td>
<td>annual growth %</td>
<td>Negative</td>
</tr>
</tbody>
</table>

These variables are expressed in US dollars to allow for easy comparison between the ECOWAS countries.

4. Result presentation and analyses

4.1 Descriptive Statistics and Correlation Matrix

Before evaluating the data series, it's critical to review the descriptive statistics to see how the variables vary and how they're distributed, as shown in Table 4.1. The measures of central tendency, mean, and median, which provide estimations of the distribution's center, are shown in Table 4.1. GDP per worker, remittances (% of GDP), trade openness (% of GDP), and broad money supply (% of GDP) are all $7419.52 billion, 4.76 percent, 1.39 percent and 36.28 percent, respectively on the average, among the selected ECOWAS countries. In comparison to other regions such as Southeast Asia and the Middle East, the ECOWAS region's average GDP per worker is comparatively low. Money supply (% of GDP), remittances (% of GDP), and trade
openness (% of GDP), all have low mean values. The average value of FDI (% of GDP) is low at 4.61 percent. With a figure of 2.61 percent, the average population increase over this time period is low. The mean and median of remittances, population growth, trade openness, and foreign direct investment are all fairly close to each other, indicating a relatively symmetric distribution with low variability. The largest recorded GDP per worker in the ECOWAS region is US$19438.73bn, while the lowest is US$2036.11bn. The largest amount of remittances received as a proportion of GDP in ECOWAS countries is 12.71% compared to a minimum of 0.26 percent. With a maximum of 104.63 percent and a minimum of 17.52 percent, the broad money supply is at its highest. Only population growth has a negative skew, but GDP per capita, remittances, trade openness, broad money supply, and foreign direct investment all have a positive skew. Finally, the Jarque-Bera statistic is greater than 0.05 percent level of significance for all of the series. The null hypothesis of a normal distribution for the series is rejected at this level of significance. Because of the cross-sectional and heterogeneous character of the data, it's possible that the data are normally distributed. Such heterogeneities are often adjusted during the estimation process in panel data analysis.

Table 4.1 Descriptive Statistics

<table>
<thead>
<tr>
<th></th>
<th>GDP</th>
<th>REMITT</th>
<th>FIND</th>
<th>TOP</th>
<th>POP</th>
<th>FDI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>7419.52</td>
<td>4.76</td>
<td>36.28</td>
<td>1.39</td>
<td>2.61</td>
<td>4.61</td>
</tr>
<tr>
<td>Median</td>
<td>5213.13</td>
<td>3.75</td>
<td>29.72</td>
<td>1.38</td>
<td>2.65</td>
<td>2.88</td>
</tr>
<tr>
<td>Maximum</td>
<td>19438.73</td>
<td>12.71</td>
<td>104.63</td>
<td>2.67</td>
<td>3.91</td>
<td>32.30</td>
</tr>
<tr>
<td>Minimum</td>
<td>2036.11</td>
<td>0.26</td>
<td>17.52</td>
<td>0.24</td>
<td>1.16</td>
<td>-1.03</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>4664.10</td>
<td>3.36</td>
<td>18.68</td>
<td>0.56</td>
<td>0.57</td>
<td>5.04</td>
</tr>
<tr>
<td>Skewness</td>
<td>1.12</td>
<td>0.59</td>
<td>2.20</td>
<td>0.11</td>
<td>-0.25</td>
<td>2.52</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>3.23</td>
<td>2.18</td>
<td>7.59</td>
<td>2.38</td>
<td>4.60</td>
<td>11.23</td>
</tr>
<tr>
<td>Jarque-Bera</td>
<td>24.76</td>
<td>10.05</td>
<td>196.92</td>
<td>2.13</td>
<td>13.63</td>
<td>453.75</td>
</tr>
<tr>
<td>Probability</td>
<td>0.00</td>
<td>0.01</td>
<td>0.00</td>
<td>0.35</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Observations</td>
<td>117</td>
<td>117</td>
<td>117</td>
<td>117</td>
<td>117</td>
<td>117</td>
</tr>
</tbody>
</table>

Table 4.2 Correlation Matrix

<table>
<thead>
<tr>
<th></th>
<th>GDP</th>
<th>REMITT</th>
<th>FIND</th>
<th>TOP</th>
<th>POP</th>
<th>FDI</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP</td>
<td>1</td>
<td>0.33</td>
<td>0.29</td>
<td>-0.77</td>
<td>-0.51</td>
<td>-0.21</td>
</tr>
<tr>
<td>REMITT</td>
<td>0.33</td>
<td>1</td>
<td>0.62</td>
<td>-0.06</td>
<td>-0.36</td>
<td>-0.15</td>
</tr>
<tr>
<td>FIND</td>
<td>0.29</td>
<td>0.62</td>
<td>1</td>
<td>-0.03</td>
<td>-0.65</td>
<td>-0.05</td>
</tr>
<tr>
<td>TOP</td>
<td>-0.77</td>
<td>-0.06</td>
<td>-0.03</td>
<td>1</td>
<td>0.29</td>
<td>0.19</td>
</tr>
<tr>
<td>POP</td>
<td>-0.51</td>
<td>-0.36</td>
<td>-0.65</td>
<td>0.29</td>
<td>1</td>
<td>-0.07</td>
</tr>
<tr>
<td>FDI</td>
<td>-0.21</td>
<td>-0.15</td>
<td>-0.05</td>
<td>0.19</td>
<td>-0.07</td>
<td>1</td>
</tr>
</tbody>
</table>

From Table 4.2 trade openness, population growth, and foreign direct investment all have positive relationships with GDP, while trade openness, remittances, and financial development all have negative relationships. Only trade openness and population growth are found to be above 0.50, indicating that GDP has a strong linear relationship. GDP and foreign direct investment have a weak and negative correlation of 0.21. Furthermore, GDP and financial development have a 0.29 weak and negative correlation. There is a high and negative correlation of 0.77 and 0.51 between trade openness, population growth, and GDP.

4.2 System GMM Panel Estimation Results for the Impact of Remittances and Financial Development on Economic Growth
The long run outcomes of the system GMM dynamic panel estimations are reported in table 4.3. A maximum of one lag of the dependent variable is used as instruments. There exists a negative and significant effect of remittances on economic growth. It implies that an increase in remittances inflows to the ECOWAS sub-region by 1% decreases GDP per labour by 0.03% within the study period. This finding supports previous research (Chowdhury, 2016; Vitenu-Sackey & Barfi, 2021; Rao & Hassan, 2011) that remittances have a significant impact on economic growth. The non-regenerating uses of remittances inflows to the ECOWAS subregion could be responsible for the negative impact of remittances on GDP over the study period. To put it another way, very little, if any, of the remittances received by the region are used to fund long-term income-generating or pro-growth activities. This indicates that most of the remittances inflows to the region are spent on consumption. The financial development estimate appeared insignificant and also has a negative relationship with GDP per labour in the region within the study period. This runs counter to the belief that financial development is essential for economic progress. They do, however, agree with Ang and McKibbin (2007), who state that the return on financial development is dependent on the mobilization of savings and the allocation of funds to effective investment projects. Because of market frictions, the relationship between savings and investment, as well as its relationship to economic growth, is weak in emerging countries. The lack of impact of financial development on economic growth in ECOWAS is further supported by the findings of Arcand, Berkes, and Panizza (2012). These studies obtained both negative and insignificant effect of financial development on economic growth in various cross-country samples. They attribute their results, along with a lack of regulatory oversight and supervision by bankers, to the expansion of credit. This may result in an inadequate selection of projects that could reflect financial development as an adverse impact on economic growth. Furthermore, rather than investing in or lending to the actual sector, such as agriculture and manufacturing, the financial sector, notably the banking system, funnels monies deposited by its customers into short-term and less hazardous investments like treasury bills and treasury certificates.

Table 4.3 Lun-run Dynamic SYS GMM Estimates

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Coef.</th>
<th>St. Error (Robust)</th>
<th>t-value</th>
<th>P-value</th>
<th>sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>lGDP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>-0.878</td>
<td>0.283</td>
<td>-3.11</td>
<td>0.00</td>
<td>***</td>
</tr>
<tr>
<td>lremitt</td>
<td>-0.028</td>
<td>0.008</td>
<td>-3.4</td>
<td>0.00</td>
<td>***</td>
</tr>
<tr>
<td>lfind</td>
<td>-0.001</td>
<td>0.014</td>
<td>-0.05</td>
<td>0.96</td>
<td>-</td>
</tr>
<tr>
<td>Initial GDP</td>
<td>1.089</td>
<td>0.025</td>
<td>44.39</td>
<td>0.00</td>
<td>***</td>
</tr>
<tr>
<td>ltop</td>
<td>0.079</td>
<td>0.021</td>
<td>3.74</td>
<td>0.00</td>
<td>***</td>
</tr>
<tr>
<td>lpop</td>
<td>0.118</td>
<td>0.04</td>
<td>2.93</td>
<td>0.00</td>
<td>***</td>
</tr>
<tr>
<td>Fdi</td>
<td>0.002</td>
<td>0.001</td>
<td>2.63</td>
<td>0.01</td>
<td>***</td>
</tr>
<tr>
<td>lremitt_lfind</td>
<td>0.001</td>
<td>0.001</td>
<td>1.99</td>
<td>0.05</td>
<td>**</td>
</tr>
</tbody>
</table>

The lagged dependent variable is positive and significant at 1% level of significance; this implies divergence in the economic growth of ECOWAS member countries. As suggested by the neoclassical theory, the economy's initial position is a major predictor of growth. Trade openness to GDP positively and significantly affects economic growth in the ECOWAS sub-region. With a coefficient of 0.079, a 1% increase in trade openness would result in a 0.08 percent improvement in economic growth. Both the neoclassical and endogenous growth theories confirm this result. Indeed, the neoclassical theory asserts that trade openness has a good influence on economic growth because of comparative advantages, but the endogenous growth theory believes that trade openness has a positive influence on growth because of economies of scale and technology diffusion among
countries. At the 0.01 percent significance level, population expansion is determined to have positive and substantial impact on economic growth with a coefficient value of 0.118. This suggests that a 1% increase in population growth corresponds to a 0.12% increase in economic growth. This finding is in line with that of Mamingi and Perch (2013), who observed that population expansion and density boost economic growth. FDI is found to have a positive and significant effect on economic growth at a 0.01% significance level. The result indicates an increase in GDP per labour by 0.002% in the ECOWAS sub-region as a result of a percentage increase in FDI to the region. This is consistent with other researchers’ findings on the relationship between economic growth and FDI. FDI flows, according to Wang and Blomström (1992), have a significant impact on economic growth and act as a driving force in the process. Investment, as identified by neoclassical and endogenous growth models, is the most important economic growth determinant, according to Podrecca and Carmeci (2001).

Furthermore, remittances and financial development were interacted to test the complementary or substitutability impact on economic growth in the ECOWAS sub-region. This idea is prompted by prior study findings that remittances can help countries develop their financial systems, implying that remittances thrive in counties where financial systems are developed (Aggarwal, Demirguc-Kunt, & Peria, 2011; Akonji & Wakili, 2013; Vitenu-Sackey, 2021d; Vitenu-Sackey et al., 2021). Others claimed that remittances operate as a substitute in countries with less developed financial systems, as they provide an alternative means to finance investment and help surmount liquidity problems (Giuliani & Ruiz Arranz, 2009; Fayissa & Nsiah, 2010; Sobiech, 2015).

Hence, the interactive term, lremitt_lfind is found to affect economic growth of the region both positively and significantly at 5%. The joint effect result (0.001%) of financial development and remittances suggests that a 1% increase in remittances boosts growth by 0.001% if the financial sector is well developed. The size of their impact on economic growth, however, is small. The significant and positive interaction effects show that in the ECOWAS sub-region, remittances and financial development complement each other. The findings suggest that in the ECOWAS sub-region, remittances and financial services work in tandem to boost growth.

### 4.2 Post System GMM Estimation Tests

To ensure that the system GMM estimator is consistent, The Arellano-Bond test for second order correlation in the first differenced residuals and the Hansen test for over-identifying restrictions are used as diagnostic tests, with the null hypothesis being that the instruments are not correlated with the residuals.

<table>
<thead>
<tr>
<th>Order</th>
<th>z</th>
<th>Pr &gt; z</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>-1.23</td>
<td>0.219</td>
</tr>
<tr>
<td>2</td>
<td>-0.92</td>
<td>0.358</td>
</tr>
</tbody>
</table>

H0: no autocorrelation

<table>
<thead>
<tr>
<th>Chi2(1)</th>
<th>Prob &gt; chi2</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.52</td>
<td>0.472</td>
</tr>
</tbody>
</table>

The robustness check results are supported by the Hansen J and Arellano–Bond specification tests. This shows that endogeneity and serial correlation bias affect robustness outcomes. The Hansen J test's null hypothesis is not rejected, indicating that the instrumental variables are not exogenously linked with the error term. As a result, the instruments are suitable for estimate. Furthermore, the Arellano–Bond test confirms that there is no
serial correlation, implying that there is no second-order serial correlation in the first difference regression (AR2). As a result, the estimated coefficients derived from the quantitative measures are shown to be reliable.

5. Conclusion

This study re-examined the relationship between remittances, financial development, and economic growth in 13 ECOWAS countries. The model was built using the System GMM estimator. According to the estimated results, remittances have a considerable negative influence on economic growth in the short term but a significant favorable impact in the long run. Financial development was found to be minimal in determining economic growth in the ECOWAS sub-region, contrary to expectations. This may be due to the fact that the financial sector, particularly the banking system, invests funds deposited by domestic and international customers in short-term, less risky investments like treasury bills and treasury certificates rather than investing in or lending to the real sector like agriculture and manufacturing.

The findings of this study have resulted in significant policy consequences and suggestions. First and foremost, this study proved that remittances help the ECOWAS sub-region thrive economically. The finding is explained by the optimistic notion that remittances received by families will boost consumption and investment, resulting in a rise in aggregate demand. Due to multiplier effects, the manufacturing sector might then benefit from increased aggregate demand.

As a result, this research suggests that remittances are a significant source of economic growth in the ECOWAS sub-region, whereas financial development is not a significant driver of economic growth. In the ECOWAS sub-region, however, the combination of remittances and financial development is critical for both short- and long-term growth. The outcome suggests that remittances and financial development can be combined to enhance economic growth in a variety of ways.

References


