Remittance and Economic Growth: New Empirical Evidence from Ecowas

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Abstract
Remittances have risen remarkably in sub-Sahara African in recent past with ECOWAS accounting for over 40%, however there seems to be a lacuna between the volume of remittance received and actual growth improvements of the region. Against this backdrop, this study investigates the effect of remittance on economic growth of ECOWAS economies using difference GMM approach between 2015 and 2022. The results suggest that while remittance remain growth driver in ECOWAS with significant direct link, ECOWAS policy stakeholders are advised to eliminate remittance impediments such as cost of sending and receiving remittances as well as the delay time.

Keywords: Remittance, Economic Growth, ECOWAS, GMM.
JEL Classification: F24, O47, O55, C23

1. Introduction

International remittance is referred to as the inflow of money from migrants to their respective ancestral homes. Remittances are key to external financing sources for developing nations in Africa, Asia, the Caribbean, Latin America, etc. In Latin America, remittances are more effective in raising investment and enhancing growth in countries with high human capital, strong institutions, and good policy environments (Fajnzylber & López, 2008). According to Ratha et al. (2023), remittance has remained the mainstay and largest external source of finance inflows to Low and Middle-Income Countries (LMCs) aside from China since 2017.

In recent history, the inflow of remittances across the globe has become unprecedented. Global remittance hit a remarkable feat of US$773b in 2021 with US$605b going to LMCs. In 2022, world remittance rose significantly by 5% to the tune of US$831b (World Bank, 2023). Specifically, different regions of the world witnessed a tremendous remittance gain in 2021. More explicitly, remittance gains in Latin America and the Caribbean were 25.3%, sub-Sahara Africa (SSA) was 14.1%, Europe and Central Asia were 7.8% whereas the Middle East and North Africa (MENA) stood at 6.9% (World Bank, 2022).

Similarly, the remittance inflow into sub-Saharan Africa in 2021 rose sharply to US$49b, a 14.1% increase against an 8.1% decrease in the previous year. This increase was attributed to the increase in economic activities in the United States (US) and Europe. The result showed that Nigeria was the largest recipient in the region, and its percentage gain was 11.2. The gain was partly because of the policy put in place which helped to channel the remittance gain through the banking system. According to Osabuohien and Efobi (2013), remittance is the second largest source of foreign financial inflows behind foreign direct investment (FDI) in sub-Saharan Africa.

Recent statistics show that among the remittance inflows into SSA, ECOWAS countries have a large share of the inflows. According to World Development Indicator – WDI (2022) statistics, Nigeria, Ghana, and Senegal are the first, second, and third largest

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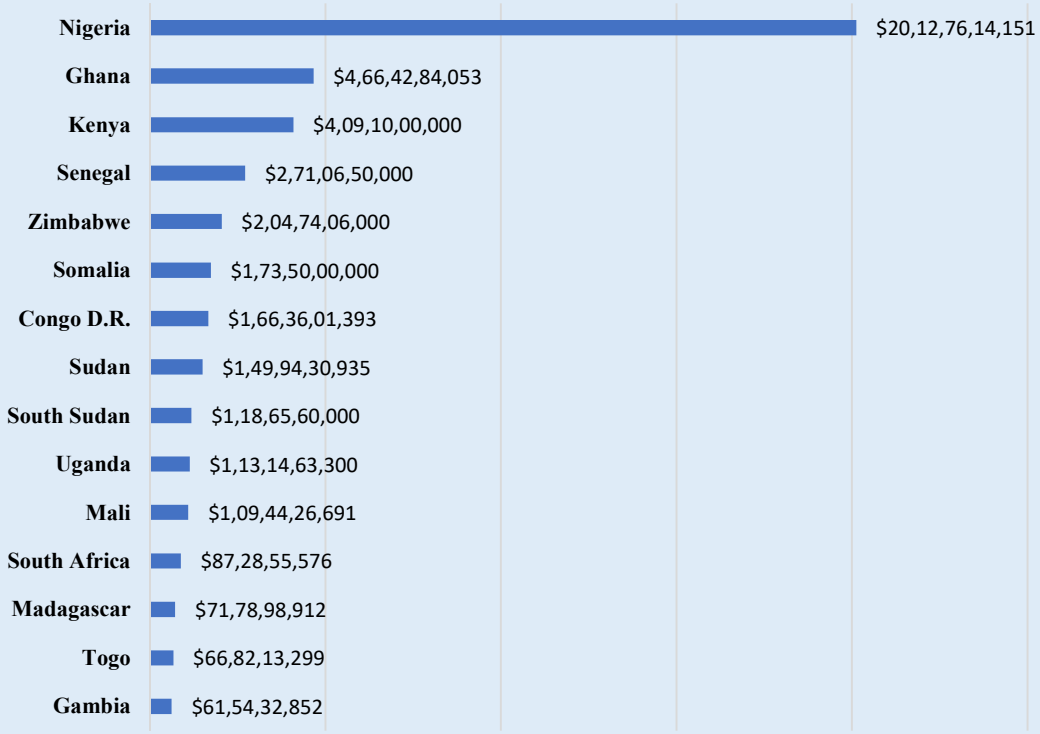
remittance recipients in SSA. While Nigeria received in value, over US$20b, Ghana and Senegal received over US$4m and US$2m respectively in 2022. Figure 1 presents the top fifteen remittance recipients in SSA.

Fig. 1 Top 15 Remittance Recipient Countries in SSA in 2022



Source: Authors' plot using WDI (2023)

The figure shows that 6 ECOWAS countries namely, Nigeria, Ghana, Senegal, Mali, Togo, and Gambia made it to the top 15 remittance recipient countries in SSA. This underscores the importance of ECOWAS in the SSA region. A simple calculation shows that out of the total remittance inflow into SSA in 2021 and 2022, ECOWAS countries account for about 93% respectively, this further x-rays ECOWAS as a significant economic player in SSA especially as it concerns remittances. That is, in 2021 and 2022, the total remittances inflow into SSA were US$48,424,325,507 and US$51,780,409,582 while that of ECOWAS inflows stood at US$45,107,234,670 and US$48,344,048,753 respectively. Similarly, the story did not change significantly with respect to remittance contribution to gross domestic product (GDP). Statistical facts indicate that most ECOWAS economies are quite reliant on remittances. This can be observed from the percentage of remittance contribution to GDP (% of GDP). Figure 2 below shows that Gambia leads (27.1%) the pack while Nigeria takes the bottom seat (4.2%) in terms of remittance (% of GDP) in SSA. Interestingly, out of the 15 ECOWAS countries, 10 made it to the top 15 economies in SSA with the largest remittance to GDP contribution in 2022. This again further justifies the role of ECOWAS economies not only in SSA but also in Africa at large.

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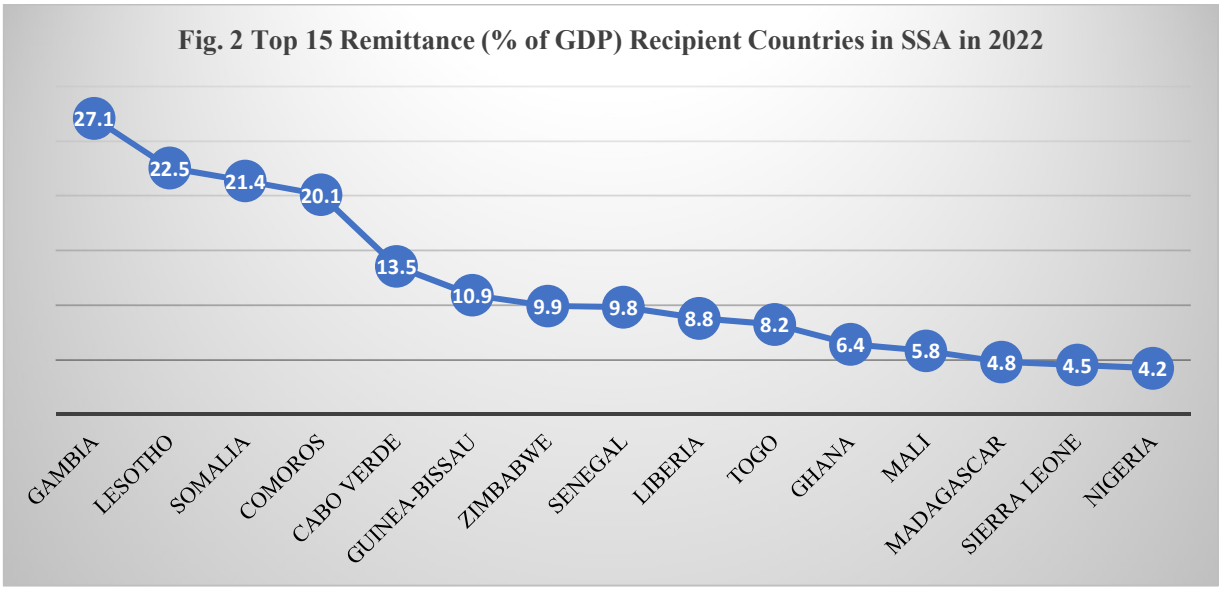

Source: Authors' plot using WDI (2023)

Consequently, the acronym ECOWAS stands for Economic Community of West Africa States. ECOWAS is an economic bloc comprising majorly West African economies. ECOWAS is also referred to as CEDEAO in French and Portuguese. The regional economic bloc has 15 member states occupying an estimated landmass of 5,114,162 km^2 (1,974,589 sq. mi) with a population of 387 million.

Nigeria, Ghana, and Senegal are the top largest remittance recipients in ECOWAS between 2020 and 2022. Nigeria remains a major economic player in ECOWAS with a receipt of over US$20b worth of remittance in 2022. Ghana, the closest largest recipient behind Nigeria, received over US$4b in 2022. This is just about 20% of Nigeria's total receipts. On the log, the least recipient is Guinea followed by her neighbor, Guinea-Bissau in the 14th position for the three-year period. Additionally, remittance (% of GDP) of the most recent years: 2020, 2021 and 2022 showed that Gambia leads with about 26.8%, 27.1%, and 27.1% while Cabo Verde follows with 13.5%, 15.0%, and 12.5% respectively whereas Guinea-Bissau in a similar order is the third with 10.9%, 12.6%, and 12.2%. This reveals that the large remittances received largely contribute significantly to the GDP of the recipient countries. Surprisingly, Nigeria which is the largest remittance (over US$20b) recipient country is seen to occupy 11th position out of the 15 ECOWAS countries. This tells us that the large remittances received by Nigeria may not have largely contributed significantly to her GDP growth. In general, the average remittance contribution to GDP in ECOWAS countries is; 5.4%, 5.6%, and 5.5% in 2020, 2021, and 2022 respectively. Figures 3 and 4 below x-ray the foregoing.

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Fig 3: Recent Value of Remittance Recipts in ECOWAS

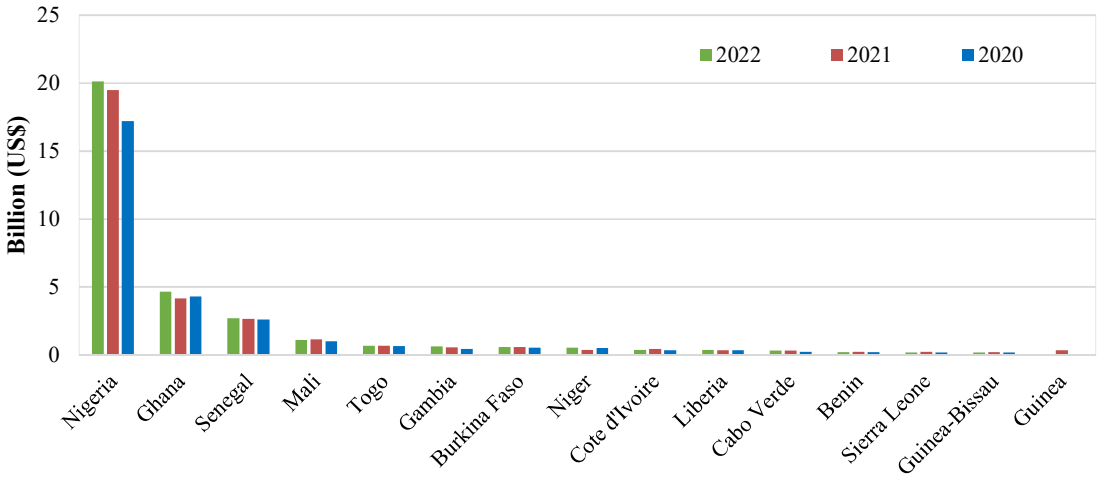
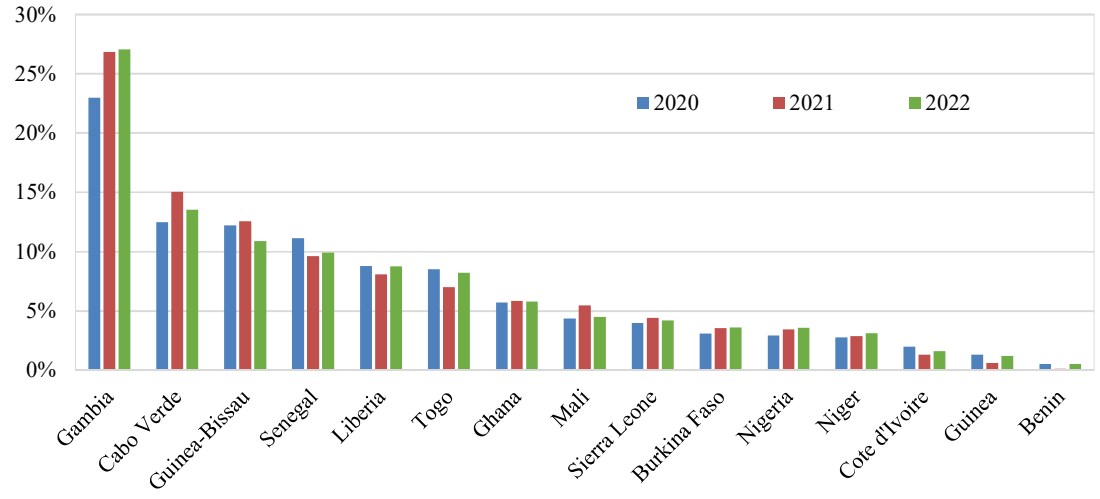


Fig 4: Remittance (% of GDP) in ECOWAS Countries



Source: Authors' plot using WDI (2023)

Furthermore, growth trend and projections in the ECOWAS region has remained very strong and positive. Report shows that growth in ECOWAS has slowed down in 2022 by 3.6% from 4.4% in 2021 (AfDB, 2023). It is however projected to make a rebound in 2023 and 2024 by about 4.1% and 4.4% respectively. The statistics show that excluding Gambia, Niger, Guinea, and Togo, all other countries' growth in ECOWAS decelerated.

Similarly, figure 5 is the pictorial presentation of the growth rate of the 15 ECOWAS countries over six years. The economic growth of the countries under consideration has been largely positive and increasing over the years except the year 2020. The economic growth of

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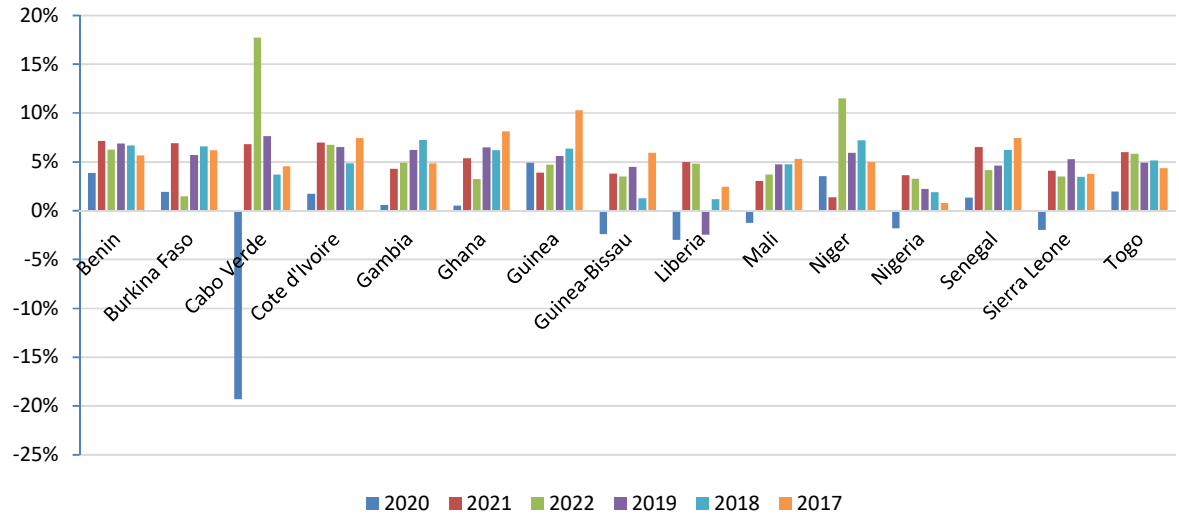
2020 was abysmally low in many countries and was even negative in 7 countries (Cabo Verde, Guinea-Bissau, Liberia, Mali, Nigeria, and Sierra Leone) with Cabo Verde being the mostly hit (-19.3%). The economic downturn of 2020 was not unconnected with what is referred to as the great recession caused by the coronavirus disease pandemic which led to a lockdown of many economies. The lockdown which started in January 2020 in most countries brought growth to its knees in many economic regions of the world including the ECOWAS subregion.

Fig.5: Growth Trend of ECOWAS Countries over six year period



Source: Authors' plot using WDI (2023)

Furthermore, figure 6 presents the mean of remittance and economic growth in ECOWAS over the last 15 years. Note that the average of growth and remittance of the 15 ECOWAS economies was taken separately to arrive at the data used to plot Figure 6. The figure reveals that both indicators largely track each other, especially in the past 15 years. For instance, the average growth rate in ECOWAS in 2022 is 5.7% while that of average remittance is 5.5% for the same year. The chart shows that while economic growth in ECOWAS is a feature of ups and downs, remittance has largely sustained steady growth over time. Specifically, economic growth recorded the least growth in 2015 turning negative in 2020. The low growth recorded can be attributed to the Nigeria recession of 2016 which started in the fourth quarter of 2015 and the 2020 negative growth corresponds to the period of the COVID-19 pandemic which plunged many economies into economic chaos. On the other hand, remittance seems to have maintained sustained growth in the years before 2015; but becomes unprecedently large in the years after the recession and the COVID-19 pandemic. Put differently, remittance is antithetical to economic growth such that remittance rises during economic hard times for the recipients while decreasing during an economic boom. This argument is deductible from the chart. For instance, growth was negative in 2020 while remittance rose sharply surpassing previous

years. This proves the assertion that remittance is counter-cyclical to the economic growth of the recipient countries. This is because remittances are sent by migrants to their families and friends to cushion the effect of the bad economy in their respective countries.

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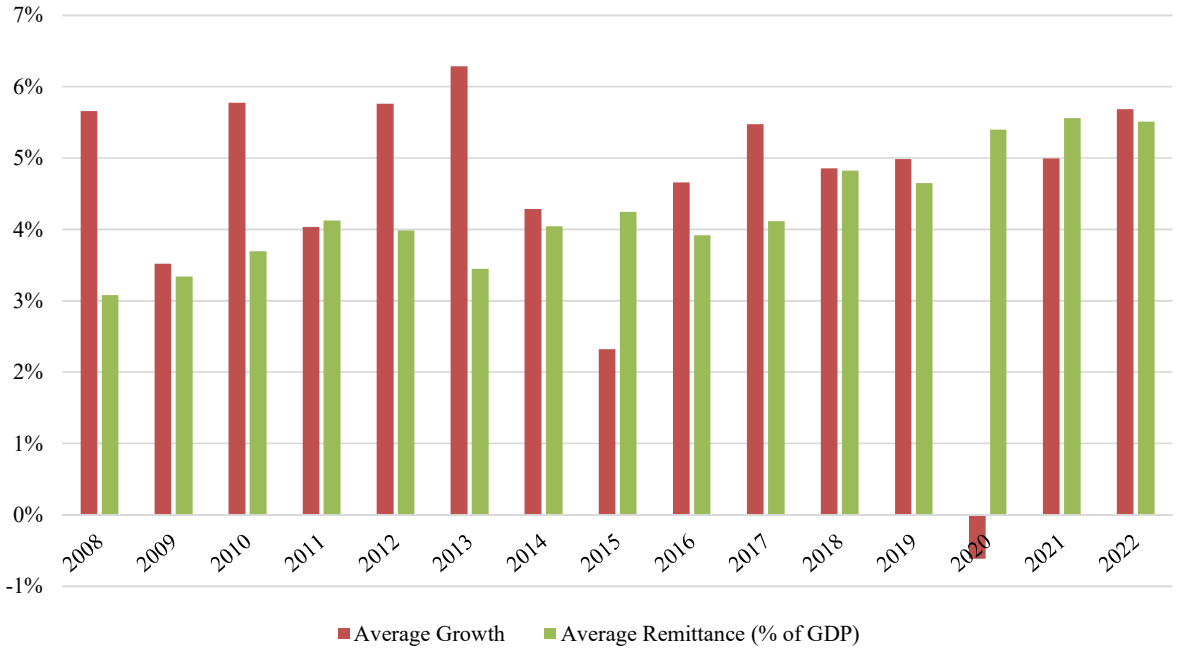
Fig. 6: Mean of Remittance and Growth in ECOWAS over 15 years



Source: Authors' plot using WDI (2023)

There exists a plethora of literature with attempts to unravel the relationship between remittance and economic growth. The literature varies from cross-country analyses to country-specific investigations. Elsewhere in the world for instance, a study of six South-East European countries by Bucevska (2022) reveals that the relationship between remittance and economic growth is significantly positive. Also, Abduvaliev and Bustillo (2019) submitted that remittance has a positive and significant impact on the economic growth of the Commonwealth of Independent States (CIS) economies. The conclusion did not change for developing economies as remittance has been found to positively and significantly impact growth (Bangake et al., 2019). Kajtazi and Fetai (2022) note that remittance significantly improves economic growth in South-East European economies. In South Asia, Islam (2022) found that remittance significantly improves economic growth. Still in Asia, 17 chosen Asian economies that receive remittances largely were examined by Dutta and Saikia (2022) and the result reveals that remittance significantly and positively improves growth.

Turning to African regional empirical evidence reveal some interesting scholarly efforts. For instance, remittance is said to be a critical factor that improves economic growth in SSA economies (Olayungbo & Quadri, 2019).

Adjei, Bo, Nketiah, Adu-Gyamfi, and Obuobi (2020) made a good attempt with respect to the association between remittance and economic growth in West African countries. The authors established a positive and significant relationship between remittance and economic growth in West Africa. In a similar study of 10 ECOWAS economies, John, Lawal, Yaw, Junior, and Mahesh (2015) posit that remittance has a significant positive impact on the economic growth of ECOWAS countries. In their own contribution, Adetou and Fiodendji (2019) argue that the impact of remittance on economic growth is dependent on the level of financial sector development and institutional quality environment especially in ECOWAS. In a recent comparative study by Izevbigie (2020), findings suggest that remittance has a more dominant influence on growth than external aid inflow in ECOWAS. The author further established the existence of

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a positive association between remittance and economic growth in ECOWAS.

Away from cross-country evidence, Bjuggren, and Dzansi, (2008) used OLS, FE, RE and GMM to demonstrate that remittance improves growth and development in recipient economies (Sweden) by directing the inflow to investment purposes. In Ethiopia, Yadeta and Hunegnaw (2022) found that remittance significantly improves growth in the long run but decreases growth in the short run with a larger impact when compared with the long run impact. According to Kiio, Soi, and Buigut (2014), an increase in remittances lead to an increase in economic growth in Kenya. In South Africa, remittance is found to have a decreasing impact on economic growth whether in the long or short run (Nyasha & Odhiambo, 2022). While controlling for the impact of the coronavirus disease (COVID-19) pandemic, Jayaraman and Makun (2021) argue that the asymmetric impact of remittance on growth in India is quite substantial. The authors posit that the impact of declining remittance on growth far outweighs that of remittance increases. Some other studies suggest that remittance enhances growth and development through a positive impact on consumption (Burgess and Haksar, 2005) and through savings and investment (Ahortor' and Adenutsi, 2009). In Nigeria, remittance decreases economic growth significantly but when moderated with globalization, it improves growth significantly (Kudaisi, Ojeyinka & Osinubi, 2022). In a similar vein, Paul and Omeje (2022) suggest that shock to remittances received wields a significant negative impact on economic growth in Nigeria. In Ghana, remittance is found to positively improve economic growth (Duodu & Baidoo, 2022). Still in Ghana, remittance significantly and positively improves economic growth both in the short and long run (Mawutor, Sogah, Christian, Aboagye, Preko, Mensah, & Boateng, 2023; Adu-Darko, E., & Aidoo, 2022). In Senegal, remittance is also seen as a growth-enhancing catalyst (Adams, Klobodu, & Lamptey, 2017). Also, when the propensity to save rises due to the reallocation of remittances received by the households, remittance received therefore raises economic growth in Burkina Faso and Senegal (Coly & Cabral, 2020). In Gambia, remittance inflows have a positive and significant impact on economic growth (Ceesay, 2020) Tenny (2022), Kruah (2017), and Orji, Uche, and Ilori (2014) suggest that remittance causes and stimulates economic activities thus improved growth in Liberia, Sierra Leone, and Nigeria.

In surprising and contrasting results, Ayenew (2022) argues based on empirical revelation that remittance inflows have a negative and insignificant impact on the economic growth of the SSA member economies. In a similar assertion, Sutradhar (2020) found that remittance inflows decrease the economic growth of India, Bangladesh, and Sri Lanka. A Nigeria study by Oshota and Badejo (2014) affirms that remittance retards Nigeria's economic growth though in the short run. In Guinea, foreign financial inflows including remittances are said to possess a negative influence on economic growth (Orji, et al., 2014). Additionally, Coly and Mendy (2020) uncover that the impact of remittance on economic growth in Senegal is significantly negative in the short run but turns insignificant in the long run.

Summarily, the foregoing explored and x-rayed the existing scholarly attempts to establish the relationship between remittance and economic growth at the country as well as multi-country levels. Extant literature shows no clear agreement or conclusion regarding the association, both at country and multi-country levels (see, Ayenew, 2022; Sutradhar, 2020; Dutta & Saikia, 2022; Adjei, et al, 2020; Kajtazi & Fetai 2022; and Orji et al., 2014). This shows that the debate as to the relationship is still ongoing and worthy of continuous academic exercise. Unfortunately, there exist very limited efforts on the subject matter in the ECOWAS sub-region. Very few attempts (Adjei, et al., 2020 and John, et al., 2015) concentrated on the West African states which differs from the present study because not all West African states are members of ECOWAS. Also, most of the studies either included some central African countries like DR Congo and Cameroon or selected fewer ECOWAS

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members (Adetou & Fiodendji, 2019; Izevbigie, 2020; and John, et al., 2022). Other studies had more interest in SSA economies (Olayungbo & Quadri, 2019; and Adjei, et al., 2020). As seen in figures 3 and 4 above, excluding Senegal, the top 5 remittance recipients in values are different from the top 5 remittances to GDP share recipients. This, therefore, suggests that remittance will have differing or varying impacts on the economic growth of ECOWAS economies. Against this backdrop, this paper examines the impact of remittance on the economic growth of ECOWAS economies by 1) including all the 15 ECOWAS member states, 2) by looking at the differences between countries of large remittance value and those with large remittance to GDP share. The rest of this paper is therefore organized thus; section 2 reviews the existing literature including theories, section 3 discusses the data and analytical methods, section 4 presents and discusses results while Section 5 concludes with policy implications.

2. Literature Review

2.2 Theoretical Overview

A. Remittance Theories

Rapoport and Docquier (2006) describe the micro-level as the family/household level where the following motives drive remittances; exchange, altruistic, investment, insurance, and inheritance components.

Altruistic: the term altruistic is synonymous with selfless and philanthropic disposition. According to Hagbe (2004), altruism implies the existence of a connection between the remitter and the home nation in terms of portfolio diversification which could be seen as a potential inducement for remitting to the home country by the migrants. If remittances increase as the receiving economy is in a downturn and decrease as the receiving economy booms that means the motive is altruistic.

Exchange: The exchange motive implies that there is an agreement between the remittance sender (the migrant) and the remittance receiver (the household). Under this motive remittance means compensation or payment for what the household is doing on his behalf, such as managing the remitter's assets, childcare, elderly care, etc. If there is progress in the economy of the receiving country, there will be an increase in the prices of services and returns that the recipient could realize from the activities apart from that mandated by the sender. This would yield pro-cyclicality with respect to the receiving country. The exchange motive suggests that there exists a direct association between remittance and growth.

Inheritance: Lucas and Stark (1985) pointed out three possibilities obtainable if a remittance sender is driven by a motivation to inherit. First, remittance could be remitted to prepare for the return of the migrant to the community of origin. Second, the migrants may send money to buy assets in the ancestral community as well as guarantee the maintenance of such procured assets. Thirdly, in this foregoing scenario, remittances are expected to display a positive association with the assets of the recipient homes (i.e., the potential inheritance).

Insurance: Because of the high risk of losing employment and means of earning income; and also, the absence of the means to cover the risks, such as unemployment insurance, members of households migrate to a labour market not correlated with the home country. The family members at home and the migrant, therefore, make an arrangement whereby the family members sponsor the migrant while the migrant sends remittances to the family members during hard times. The insurance motive yields counter-cyclicality because a negative shock in the country of origin is well rewarded by remittances. However, Amuedo-Dorantes and Pozo (2006) reveal the existence of contrasting arrangements where a family provides insurance coverage to the remitter.

Investment: If remittance is based on an investment motive, it then follows that families sent migrants abroad to raise the family's income stream. With this, one can term remittances to mean return on human capital investment where a family member is sent abroad by the family with the sole motive of increasing and receiving more remittances/family income and wellbeing. Investment-insurance-driven remittance may

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be the reason behind the cyclical response of remittance to change in sending country's GDP. This can be possible if returns on assets in the sending nation are lesser than in the receiving economy. This will as well produce counter-cyclicality with reference to the GDP of the sender's country. However, if there is an income opportunity loss by the migrant home country due to an economic downturn, remittances will therefore be expected to be procyclical with respect to its GDP.

B. Growth Theories

Neoclassical Growth Theory

The Neoclassical growth theory is of the view that an increment in labour or capital leads to diminishing returns. By this, they mean that increasing capital has only a short-term impact on economic growth. The steady state of the economy is therefore maintained by the increase in capital. This conclusion is entrenched in the Solow growth model which is known to be a model of capital acquisition in a pure production economy. The model implies that technological coefficients are presumed to change during the production process and the ratio of capital to labour (K/L) may correct itself to an equilibrium ratio over time. The production function in the Solow neoclassical growth model is mathematically represented thus;

$$Y = K^{\alpha}(AL)^{1-\alpha}$$

$Y = \text{GDP or output}, K = \text{capital stock}, L = \text{labour}, \text{and } A = \text{labour effectiveness}.$ A is assumed to grow exogenously.

Harrod-Domar Growth Theory

The neoclassical growth model presented by Solow differs greatly from that of the Harrod-Domar. This theory postulates that if an economy must grow, the economy must have to save a fraction of its national income in order to change impaired/depreciated capital goods and make new investments. These new investments denote net additions to capital. Harrod-Domar growth theory, therefore, concludes that the GDP growth speed is jointly dependent on the national savings and the national capital-output ratio (K/Y). This theory opines that without the government, the national income growth rate will have an inverse and direct association with the economy's capital-output and savings ratios respectively (Todaro and Smith, 2012).

Endogenous Growth Theory

The deficiencies in Solow neoclassical growth theory prompted the emergence of endogenous growth theory. It explains the long-run economic growth of an economy on the basis of factors that are endogenous against exogenous factors. Arrow (1962) is of the view that learning by doing is part and parcel of the growth process. The theory observed that economic growth will be triggered through the improvement in a nation's human capital development such as knowledge or technology which translates into an effective and efficient means of production.

Frankel (1962) introduced AK theory which is also regarded as the paramount version of the endogenous growth theory. The author argues that the total production function exhibits a constant or an increasing marginal product of capital. This arises as a result of capital amassment by firms where most of the capital acquired is in the form of intellectual capital which produces technological progress. This theory therefore suggests that the long run growth of any economy is dependent on the savings rate.

Presumably, saving as a fraction of output denoted by s with a constant rate of depreciation denoted by δ yields a total net investment thus;

$\frac{dK}{dt} = sY - \delta K$; and thus, growth rate is given by; $g \equiv \frac{1}{Y}\frac{dY}{dt} = \frac{1}{K}\frac{dk}{dt} = sA - \delta.$ 2.2

Equation 2.2 implies that a rise in savings rate will translate into an everlasting higher growth rate.

2.3 Empirical Facts

Remittances and Economic Growth Within Ecowas Sub-region

In an effort to find the relationship between remittances and economic growth in ECOWAS countries, a lot of empirical work has been done. For instance, Kudaisi, Ojeyinka & Osinubi, (2022) in their work, financial liberalization, remittances, and economic

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growth in Nigeria between 1990-2018. The generalized method of moments (GMM) was employed; and findings suggest that there exists a negative and significant relationship between remittances, financial liberalization, and economic growth. Furthermore, the interaction term of financial liberalization and remittance on economic growth is found to be positive and significant, which may mean that the two variables can complement each other to raise growth in Nigeria. Similarly, Olaniyan, et al (2022) studied the impact of financial sector development, remittances, institutions, and economic growth within the period of 2000-2017 using a two-stage least square instrumental variable estimator. The study finds that remittances and economic growth have a negative and significant relationship with economic growth in ECOWAS. Still, the interactive term of financial sector development and remittances has a positive and significant impact on economic growth. This also supports the substitutability hypothesis of the two variables. Additionally, while the forgoing indicates inverse association between remittance and growth, a good number of studies however suggest existence of direct association. For instance, Izevbigie et al (2020) examine the comparative analysis of foreign aid inflow and remittances on economic growth in the ECOWAS sub-region between the period spanning from 2005 and 2017. GMM estimation technique was also employed to analyze the data. The result shows a positive and significant relationship between foreign aid inflow, remittance, and economic growth. The result also shows that the effect of remittance on economic growth is bigger than that of foreign aid inflow on economic growth. Also, Duodu & Baidoo (2022) examine the relationship between capital inflow and economic growth in Ghana between the period of 1984-2018. Employing an auto-distributed lag model, their result without an interactive term reveals a positive relationship between remittances and economic growth in Ghana, while foreign direct investment and external debt were found to negatively impact economic growth in the long run whereas foreign aids have an insignificant impact on economic growth in both short run and long run. Furthermore, the interaction term between remittance and quality of institution variables shows a positive relationship with economic growth in the long run. Ajide & Raheed (2016) investigated the impact of institutions in attracting remittances inflow into the ECOWAS subregion in the period spinning 1996-2013. GMM was adopted in the analysis of the dataset, and the result suggested that institutional infrastructures are significant in attracting remittances into ECOWAS countries. More precisely, governance proxy as one of the institutional measures, appears to positively attract remittances into ECOWA, while other measures such as political and economic structures have a negative and significant impact on the process

Remittances and Economic Growth Outside ECOWAS Countries.

Sutradhar, (2020) examines the relationship between remittances and economic growth in four Asian countries between the period 1977 to 2016 using random effect, fixed effect, pooled OLS, and dummy variable interaction models. The estimation reveals that remittances negatively impacted economic growth in Pakistan, Bangladesh, and Sri Lanka. On the contrary, remittances are seen to have a positive relationship with economic growth in India. However, the study indicates an existence of a joint negative and significant relationship between the four countries under consideration. Similarly, Chowdhury, et al (2023) also investigate the relationship between remittance and economic growth in three low-income Asian countries between the period 1990 - 2019. The random effect, fixed effect, and pooled ordinary least squared were also applied for the estimation as Sutradhar, (2020) above. The result shows a negative and significant relationship between remittances and the economic growth of the sample countries. Analogously, Qutb, (2021) examines the impact of migrants' remittances and economic growth in Egypt from the period spanning from 1980 to 2017. A vector error correction model (VECM) is used for the short-run and long-run estimate, and the result reveals a

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countercyclical relationship between migrants' remittances and economic growth in the sense that remittances have a long-term negative impact on economic growth. Unlike the forging which asserts negative relationship between remittance and growth elsewhere outside ECOWAS, some few studies suggest otherwise. Example, Mohamed Aslam, and Alibuhtto, (2023) attempt to analyze the impact of workers' remittances on the economic growth of Sri Lanka using a time series data between 1975-2021.The autoregressive distributed lag (ARDL) bounds technique, impulsive response function, and Granger's causality test were used for the regression analyses; and the result shows a positive and significant long run relationship between workers' remittances and per-capita gross domestic product (GDP). Finally, Cazachevici, et al (2020) on their empirical analyses of the impact of remittances on economic growth in a quantitative survey of 538 estimates reported in 95 studies. Their results show 40% positive effect, no effect was reported in 40% and 20% reported a negative effect. However, after correcting for the bias indicated in favor of positive effects; the estimate confirms that remittances still positively impacted economic growth.

3. Data and Methodological Mechanics

3.1 Data

The data for this study follows a dynamic panel dataset of 14 ECOWAS economies. The economies are all the fifteen (15) economies that made up ECOWAS less Liberia. Liberia was dropped from the dataset simply due to the paucity of data availability associated with most of the target variables used in this study such as capital formation, remittances etc. therefore, the countries studied are; Cabo Verde, Gambia, Ghana, Guinea-Bissau, Senegal, Togo, Benin, Burkina Faso, Cote d'Ivoire, Guinea, Mali, Niger, Nigeria, and Sierra Leone. The variables employed are summarized in table 3.1.

Table 3.1

Code	Description
lnecg	GDP (constant 2015 US$)
lnrem	Personal remittances, received (current US$)
tro	Trade (% of GDP)
lab	Labor force participation rate, total - ages 15-64 (% of total population)
cap	Gross capital formation (GDP share)
pop	Total Population (ages 15-64)

Source: WDI (2023) dataset.

Most of the variables do not have value for year 2022 and those affected were updated using extrapolation technique. Therefore, the panel dataset spans from 2015 to 2022. Aside economic growth proxy (lnecg) and remittance (lnrem) that were logged before estimation, every other variable is used in their normal natural forms.

3.2 Methodological Mechanics and Theoretical Undertone

The ensuing method of this study is built on the endogenous growth model credited to Arrow (1962) and modified by Frankel (1962). This theory is the most suitable in the present study because of the insights it offers in terms of factors that is shaping economic progress of economies. Arrow was able to offer convincingly emphasis on the importance of endogenous treatment of technological progress instead of exogenous treatment like the neoclassical theorists. Frankel buttressed Arrow's proposition in what is known as the AK model in the literature. A and K stand for

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knowledge and capital accumulation respectively. The theory therefore summarizes that economic growth miracles experienced by some economies is explainable by the dynamism of capital and knowledge accumulation built on the pillars of research and development and made possible by learning by doing. Also, indicators such as remittance and capital have been greatly promoted in recent time by innovation and technology. For instance, technology and innovation have made it possible for people to remit or receive remittance from anywhere around the globe just a button clicks. This also has no doubt spurred savings and ultimately improved capital accumulation. Thus, long run economic growth is argued in this study to be well explained by this model hence its choice for the study.

3.3 Generalized Method of Moment Approach

The study adopts generalized method of moment (GMM) tool built on dynamic panel data (DPD) framework. This estimator has the desirable property of producing efficient estimates while accounting for higher-order serial correlation, heteroscedasticity and endogeneity inherent in timeseries econometrics. Also, GMM is found to be asymptotically consistent in short panels. Therefore, data generating process (DGP) in this study is of short period (T) with large cross section (N). That is our T < N where $T = 8$ and $N = 14$. Importantly and more specifically, GMM controls for dynamic panel bias associated with short or micro panels (Bond, 2002; Baltagi, 2005; Bun & Windmeijer, 2010). In this regard, the nature of the dataset used in this study where the T < N conforms with the foregoing and consistent with literature. Studies of this kind that applied GMM approach include but not limited to; Wooldridge (2001); Ogbonna, Ogbuabor, Manasseh and Ekeocha (2021); Mileva (2007); Labra and Torrecillas (2018); Roodman (2009); and Nayan et al. (2013). Thus, the GMM panel under DPD is specified as follows;

$$\begin{aligned} \text{lnecg}_{it} = {} & \alpha_0 + \alpha_1 \text{lnecg}_{i,t-1} + \beta \text{lnrem}_{it} \\ & + \gamma \text{cap}_{it} + \varphi \text{tro}_{it} + \omega \text{lab}_{it} \\ & + \delta \text{pop}_{it} + \eta_i + e_{it} \ldots\ldots (1) \end{aligned}$$

where, η_i represents the unobserved heterogeneity that vary across cross sectional units and fixed over time. $\alpha_0 =$ constant; $\alpha_1, \beta, \gamma, \propto, \varphi, \omega$ and $\delta =$ estimable parameters; In = natural log notation, and $e_{it} =$ idiosyncratic error assumed to be independently and identically distributed (IID). Equation (1) is employed to estimate the effect of remittance inflow on economic growth in ECOWAS which is the first and major objective of this study. A sure way to address the unobserved fixed effect or heterogeneity problem suffered in equation (1) is to apply first differencing on the model. In line with this, the first difference transformation of equation (1) is given as;

$$\begin{aligned} \Delta \text{lnecg}_{it} = {} & \alpha_0 + \alpha_1 \Delta \text{lnecg}_{i,t-1} + \beta \Delta \text{lnrem}_{it} \\ & + \gamma \Delta \text{cap}_{it} + \varphi \Delta \text{tro}_{it} \\ & + \omega \Delta \text{lab}_{it} + \delta \Delta \text{pop}_{it} \\ & + \Delta e_{it} \ldots (2) \end{aligned}$$

where, Δ is the first difference operator while every other item remains as defined earlier. GMM approach involves instrumenting with the transformation of level equations into first differences. This process lies the strength of GMM in solving serial correlation, heteroscedasticity, endogeneity as well as identification problems in practice. But Anderson & Hsiao (1981) suggest the use of lagged value of the endogenous variable ($\Delta \text{lnecg}_{i,t-i}$) as internal instrument. Under GMM environment, we have difference and system GMM with latter allowing for inclusion of higher order lagged difference as possible instruments. Since differencing is the key approach used to eliminate unobserved fixed effect in (1) under difference GMM (DGMM) framework, it then implies that DGMM is most efficient for dataset with no missing data. Interestingly, this is the case with the dataset used in the present study as the dataset has no missing data thus there is no gain of applying system GMM (SGMM) though SGMM is preferred in the presence of missing data.

3.4 Fixed and Random Effect Models

Fixed effect (FE) and Random effect (RE) models are built to correct the deficiency of pooled ordinary least square (POLS). FE and RE framework are based on static models.

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These approaches follow static model. This is particularly ideal to achieve the second objective of this paper. That is, when the ECOWAS economies are classified on the basis of those with high and low remittances, the number of cross-sections reduces such that dynamic panel is no longer admissible. This challenge therefore favours static models wherein FE and RE overwhelmingly perform better than POLS hence its adoption.

4. Results and Discussion

Table 1 Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max	Skewness	Kurtosis
lnecg	112	23.228	1.553	20.723	27.015	.5883299	3.298633
cap	112	23.76	7.376	7.823	52.67	.8642339	5.053803
lab	111	62.095	6.975	46.882	80.074	.2263321	2.34937
lnrem	112	19.999	1.545	16.951	23.901	.8667336	3.51821
tro	112	59.425	19.908	16.352	115.037	.6299218	3.745221
lnpop	112	15.653	1.326	12.801	18.603	-.1867325	3.37086

Source: Authors' computation using STATA 15

Table 1 shows the descriptive statistics for all the variables used in the ensuing panel analyses. The results show that all the variables have large deviations around their mean growth rates. For instance, the mean growth rate of economic growth (lnecg) and remittance (lnrem) in ECOWAS are about 23.2% and 19.9% whereas their standard deviation values are approximately 1.6 and 1.5 respectively. The mean of economic growth is quite interesting but it not sustainable given the large dispersion around the mean. The economic implication of the large dispersion is that the economic growth and remittance of the ECOWAS region fluctuates heavily given any economic shock. Also, it shows how the economic growth and remittance are distorted in the region. This statistic is not however surprising as Nigeria who contributes about 41.6% of the total remittance value in ECOWAS pulls other economies when it is pooled and average across the economies. This is because Ghana who is second largest remittance recipient behind Nigeria accounts for about only 9% of the total remittance inflow into ECOWAS for the year 2022. In terms of normality result housed by skewness and kurtosis, it is observed that none of the variables follow normal distribution. In fact, all the variables are positively skewed except for the population (lnpop) whereas capital (cap) has the flattest tail.

Table 2 Matrix of correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)
(1) lnecg	1.000					
(2) cap	0.048	1.000				
(3) lab	0.163	-0.012	1.000			
(4) lnrem	0.758	0.067	0.110	1.000		
(5) tro	-0.420	0.232	-0.198	-0.458	1.000	

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(6) lnpop	0.741	-0.061	0.218	0.670	-0.514	1.000

Source: Authors' computation using STATA 15

Table 2 presents the contemporaneous correlation of all the utilized variables. A matrix of correlation shows a collinearity relationship among the countries under consideration. For instance, we can see that the relationship between remittance and economic growth is highest with 0.76 coefficient, followed by population and economic growth with value of 0.74; while the least is population (lnpop) and trade (tro) with a value of -0.51, followed by tro and remittance (lnrem) with a value of -0.46. The result also shows that most of the variables are positively correlated as indicated by their positive correlation coefficients whereas variables like trade (tro) and economic growth among others have inverse correlation. In general, collinearity between variables could not be established since none of the correlation coefficient is greater than or equal to 0.80.

Table 3 Hausman Test

Regression Group	**Ch-square Statistic**	**p-value**	**Remark**
Low remittance countries	0.11	0.9998	Random Effect Preferred
High remittance countries	177.91	0.0000	Fixed Effect Preferred

Source: Authors' computation using STATA 15

The table 3 above presents a Hausman test. A Hausman test help us to make a choice between Random and fixed effect models. The null hypothesis states that random effect is preferred. Therefore, for the regression involving countries of low remittance share to GDP, the test indicates that we cannot reject the null hypothesis given the p-value of 0.99 thus random effect is preferred against the fixed effect. Similarly, results from the high remittance share to GDP countries show clear evidence against the null ($p<0.05$) such that the fixed effect model is chosen ahead of the random effect model.

Consequently, table 4 houses the empirical results for this study. The table presents one-step and two-step difference GMM alongside the random and fixed effect results. The results show that past history of economic growth positively and significantly influence the economic growth of the current period in ECOWAS. Specifically, on the average, 1% increase in the level of economic growth of the previous year is associated with about 0.41% rise in the economic growth of the current year in ECOWAS all things being equal.

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Table 4 Regression Result

Dep Var: Lnecg	**(1)**	**(2)**	**(3)**	**(5)**
			Country Of Low Remittance	**Country Of High Remittance**
Variables	**One-Step Difference Gmm**	**Two-Step Difference Gmm**	**Random Effect Model**	**Fixed Effect Model**
L.Lnecg	0.409***	0.470***		
	(0.139)	(0.131)		
Cap	-0.00367**	-0.00301**	-0.000863	-0.00769***
	(0.00151)	(0.00133)	(0.00133)	(0.00132)
Lab	0.00762***	0.00759***	-0.00629	0.00205
	(0.00114)	(0.00114)	(0.00389)	(0.00504)
Lnrem	0.00645**	0.00935**	-0.0169	-0.00400
	(0.00297)	(0.00404)	(0.0175)	(0.0131)
Tro	0.00197**	0.00233*	0.000235	0.00123*
	(0.000831)	(0.00120)	(0.000953)	(0.000724)
Lnpop	0.761***	0.694***	1.360***	1.726***
	(0.169)	(0.133)	(0.0922)	(0.111)
Constant			2.417	-3.058*
			(1.488)	(1.533)
Observations	83	83	63	48
R-Squared				0.889
Number Of Group	14	14	8	6
No Of Instruments	26	26		
Ar (1) Statistic	-2.32	-2.32		
Prob. Of Ar (1)	0.020	0.020		
Ar (2) Statistic	0.18	0.18		
Prob. Of Ar (2)	0.858	0.858		
Sargen Overidentification Test	3.41	3.41		
Prob. Of Sargen Test	0.638	0.130		
Hansen Overidentification Test	8.53	8.53		
Prob. Of Hanen Test	0.130	0.638		
Diff. In Hansen Stat	7.86	7.86		
Prob. Of Diff. In Hansen Test	0.097	0.097		
Country Effect	No	No		
Time Effect	No	No		
F-Statistic				59.48
Prob Of F-Statistic				0.0000
Wald Statistic			307.66	
Prob Of Wald Statistic			0.0000	

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Source: Authors' estimation using STATA 15; Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

In the same vein, the relationship between economic growth and capital (cap) in ECOWAS is inverse and statistically significant at 5%. This implies that 1% rise on the share of capital to GDP will on the average significantly decrease the economic growth in ECOWAS by about 0.37% other things remaining constant. This result is however surprising as one would expect capital to be an economic growth driver. This result could be as a consequence of the peculiarity of ECOWAS economies that is largely classified as a low-income economy. It is no longer news that ECOWAS economies are import driven or dependent such that the economy is highly responsive to fluctuations in the forex market. These fluctuations make investment in the capital stock more or less counterproductive such that investors and businesses lose heavily due to the market instability. Also, the

dollarization of the ECOWAS economy is not doing the economy any favor rather it is harming the economy. For instance, a company with large inventory stock capital may experience loss due to market shock when the cost of reordering outweighs the sales revenue. This is as a result of market instability characterized by persistent shocks such that businesses cannot predict what will happen in the next minute. This is practically the case in most ECOWAS economies especially in Nigeria where purchases made today varies significantly with similar purchases made tomorrow due to the sharp price movements. Ajose and Oyedokun, (2018) found similar result between capital formation and economic growth though their study centered on Nigeria. However, this result disputes the growth-capital positive association established by Jayaraman and Makun, (2022) though this study is country-specific centered on India. In a similar fashion, Labour (lab) and economic growth also have a positive and significant relationship. The relationship shows that 1% increase in labour brings about 0.76% rise in economic growth, all things being equal. The findings with respect to labour validates most economic theories especially that of endogenous growth model unto which this study is built. Labour force has remained the major economic driver especially in recent time that labour is treated as a human resource instead as mere personnel. In fact, more recent advances in human resources management imply that labour is human capital such that organizations now see labour as human capital where investment can be channeled whose implication is economic prosperity.

Similarly, remittance is positive and significantly related to economic growth, such that 1% increase in remittance (% of GDP) yields about 0.0065% increase in economic growth. This result validates the few previous studies in ECOWAS and west Africa (Adjei et al., 2020; Izevbigie et al., 2020; and John, Lawal, Yaw, Danso-Mireku, & Mahesh, 2015) and a few others from elsewhere regional blocs (Bucevska, 2022; and Eggoh et al., 2019). Etonam, Adetou and Fiodendji, (2019) also found similar results as ours in this study though the authors established different levels at which remittance positively and significantly improves economic growth in ECOWAS. No doubt, remittance has been proven to be an economic succor through improvements on the household income which in turns contributes to the economic activities through investment activities of the recipient households. In ECOWAS where financial sector is known to be underdeveloped, remittance serves as a source of credit to citizens who may not be able to access credit through traditional credit and financial institutions. Also, ECOWAS constituting predominantly low-income-countries has come to use remittance to assuage the economic hardship common in the region thus welfare of the remittance recipients as well as economic growth is improved. This finding is not however sacrosanct as few studies found opposing conclusions. For instance, Ayenew, (2022) suggests that remittance negatively and insignificantly influence economic growth in sub-Saharan African economies. These

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findings can actually be true if the economic behavior of the recipient households is rooted on consumption instead of investment on productive ventures capable of stimulating the economic growth. Therefore, with the empirical revelations in the present study, it then implies that household recipients of remittances in ECOWAS region invests the receipts in viable productive ventures with the intent of improving their lifetime welling. Happily, this result overwhelmingly validates the theories (altruistic, investment, insurance and inheritance) behind remittance. Additionally, credit constraint hypothesis buttresses the argument that remittance tends to serve as a catalyst to economic growth in the presence of poorly developed financial environment whose case can be likened to the ECOWAS financial environment.

Furthermore, our findings suggest that trade also has a positive and statistically significant relationship with the economic growth. The result shows that 1% increase in trade as a share of GDP (tro) is related to 0.20% rise in economic growth of ECOWAS countries, all things being the same. This finding is interestingly consistent with the earlier suggestions by Ayenew (2022), Eggoh, Bankake and Somedo (2019), Bucevska (2022), and Izevbigie (2020). Liberalization of the ECOWAS economies has resulted to increased trade and interaction between the region and the rest of the world. Trade theories suggest that trade interaction among countries imply that consumers have variety of goods/services basket to consume from thus stimulating healthy competition of the local industry and ultimate growth of the local firms. Further results indicate that population (lnpop) is significantly and positively associated with the economic growth of the ECOWAS economies. Empirical evidence suggests that a percentage increase on the population of ECOWAS region will lead to about 0.76% rise on the economic growth other things be equal. Consistent with this finding are Ayenew (2022), Eggoh, et al., (2019), Bucevska (2022), and Izevbigie (2020). Therefore, this result is expected as population has been described as economic catalyst. That is, a country with huge population is definitely a huge market for any legitimate business and a fertile land for investors. For example, countries with huge population such as China, India, Brazil, United States, Russia and Nigeria have demonstrated the inherent strength of population. China, India, Brazil is no doubt emerging economic powerhouses whereas Nigeria remains the economic powerhouse of the entire black race, all thanks to their huge population. The economic implication of population is that consumption is stimulated thereby stimulating effective demand which ultimately improves companies' financial position through improved inventory sales and production activity. This underground activity in the industry boosts economic growth through increased income of employees as well as the expansion of the employment capacity of the industry. A few studies like Adeji, Bo, Nketiah, Adu-Gyamfi and Obuobi (2020), and John, et al (2015) however infirm this finding with respect to population.

On the differential effects of remittances on growth based on the classification of high and low remittance contribution to GDP economies in ECOWAS, remittance is found to wield a negative and insignificant influence on both countries with low and high remittances in ECOWAS. This finding is quite surprising as one would expect remittance to positively and significantly influence economic growth at least in high remittance recipient economies (Cabo Verde, Gambia, Ghana, Guinea-Bissau, Senegal and Togo) than in low remittance economies (Benin, Burkina Faso, Cote d"Ivoire, Guinea, Mali, Niger, Nigeria, and Sierra Leone) but this is not the case here. However, this is not the case though the possible reason behind this result has already been offered above. That is, it is possible that remittances received in high remittance economies is only used for consumption and other frivolities such as ceremonial activities (burial, weddings, marriages etc). Another reason as suggested in the literature (Ayenew, 2022) is that remittance could induce laziness on the part of recipient households such that they choose leisure instead of offering to work for compensatory wage/salary. For the low

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remittance economies in ECOWAS, while the scenario could be as earlier discussed, it could also be that the remittance receipts are quite small such that it is insignificant to improve growth. Figure 4 depicts this scenario. Other findings indicate that while capital remains negatively associated with growth in both high and low remittance economies, it is only statistically significant in economies with high remittance contribution to GDP. This result is consistent with the earlier established results in this study for the entire 14 EOWAS economies used herein. Labour (lab) and trade (tro) are both statistically insignificant at 5% level in both classifications (high and low remittance economies) with positive associations except for labour which is only negative in low remittance economies. Finally, population is statistically significant and positively associated with economic growth in both low and high ECOWAS remittance recipient economies. This implies that 1% rise in population growth will be associated with 1.36% and 1.72% increase in the economies of both low and high remittance recipients in ECOWAS respectively. This finding is consistent with earlier findings comprising the entire ECOWAS economies as already established in this study.

Finally, the results presented herein are reliable as it satisfies second order econometrics tests. Such tests include, serial correlation in the errors presented by AR (1) and AR (2), Sargen and Harsen test of overidentification or instrument validity all of which overwhelmingly support economic a priori. For instance, errors are allowed/expected to correlate in the first-order autoregression but not in the second-order. P-value ($p<0.05$) of AR (1) shows that the errors are correlated in the first-order whereas the second-order-AR2 ($p<0.05$) shows that errors are no longer correlated. Similar results apply to the overidentification or instrument validity tests as both Sargen and Harsen p-values suggest supporting evidence in favor of the null hypothesis that the instruments are valid hence they are not overidentified.

5. Conclusion and Policy Implication

This study investigated the effect of remittance on the economies of ECOWAS region using dynamic panel data based on difference GMM. The results on the one hand show that remittance, capital, labour, trade, and population are all statistically significant in both one-and two-step difference GMM except for trade which is only statistically significant at 10% under two-step framework. Under both frameworks (one-and two-step), all the variables are positively associated with economic except capital whose association with economic growth is negative. These findings overwhelmingly support existing studies (Ayenew, 2022; Eggoh, et al.,2019; Bucevska, 2022; Izevbigie, 2020; and Ajose & Oyedokun, 2018) whereas a few others however infirm it (Adeji, et al., 2020; John, et al., 2015; and Jayaraman & Makun, 2022). On the other hand, the results from low and high remittance recipients' economies reveals that most of the variables are statistically insignificant except population with varying degree of associations. Capital is statistically insignificant for low remittance economies but under high remittance economies, it is statistically significant. It then implies that population remains the key driver of economic growth in both high and low remittance recipient ECOWAS economies. Overall, remittance, labour, trade and population remain key determinants of growth on the larger ECOWAS economy. This suggests that remittance can assuage the financial and credit bottlenecks inhibiting growth in ECOWAS and as such, bottlenecks associated with remittances such as cost of sending remittance, delays in redeeming sent remittances, charges associated with accessing remittances by recipients and so on will have to be addressed by relevant policy stakeholders in the region so as to encourage more remittance inflows in ECOWAS subregion. The implication of this is that, with these enlisted and other appropriate policies in place, per capita income of the region will rise leading to economic prosperity and reduced poverty.

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Author Contributions Statement:
While Sunday E. Egbo took care of the introductory and literature review parts, Ikenna Paulinus Nwodo handled data and methodology, analysis and discussion of results as well as conclusion sections.

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