Remittances, Financial Sector Development, Institutions and Economic Growth in the ECOWAS Region

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Abstract

We investigate the relationship between remittances, financial sector development, institutions, and economic growth in a panel of 15 Economic Community of West African States (ECOWAS) over the period 2000-2017. The empirical evidence is based on the Two-Stage Least Squares Instrumental Variable (2SLS-IV) estimator, which provided two main findings. First, measures of remittances themselves had negative and significant effects on economic growth in the ECOWAS sub-region. The interactive effects of remittances and measures of financial sector development promote growth in the sub-region, thus supporting the complementarity hypothesis. Second, measures of institutional quality had positive and significant effects on the growth of countries in the ECOWAS area. Meanwhile, the interactive terms of remittances and institutional quality show support for the substitutability hypothesis. Therefore, remittances substitute for the presence of weak institutions in the ECOWAS area. Based on the preceding, we suggest the need for ECOWAS countries to further broaden the roles of financial sector institutions inside the remitting process to enhance savings mobilisation and channel the remitted funds into productive and growth-enhancing activities. Moreover, policymakers in ECOWAS countries need to strengthen governance institutions, which could increase the developmental benefits of remittances.

Keywords: *Remittances; Financial Development; Institutional Quality; Economic Growth; ECOWAS*

Introduction

Remittances have attracted much attention in the literature due to its developmental potentials. Remittances that naturally come from international migration serve as the compensation received by recipient countries for parting with a portion of their human capital (Blouchoutzi & Nikas, 2014). Remittances are important sources of external financing for many low-income countries because they are stable, reliable, and least volatile transfers (Ajayi et al., 2009; Zghidi, Sghaier & Abida, 2018).

Over the past decades, the sheer volume of remittances to developing countries has been increasing; the estimated amount of remittances officially received by these countries rose to US$466 billion in 2017 and estimated to reach US$485 billion in 2018 (World Bank, 2018). In the African region, many countries have, for decades, continue to enjoy a massive inflow of remittances as a result of an increasing stock of emigrants in search of better living and working conditions. According to the World Bank (2019), remittances to sub-Saharan Africa (SSA) were estimated to have reached US$46 billion in 2018, it grew by 9.6 percent from $US42 billion in 2017 and projected to increase to US$48 billion and US$51 billion by the end

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of 2019 and 2020, respectively. Meanwhile, literature has shown that the contribution of remittances to the growth of developing countries surpasses other financial flows such as official development assistance and private equity flows (Giuliano & Ruiz-Arranz, 2009; Olaniyan, 2019; Sobiech, 2019; World Bank, 2015).

At the sub-regional level, remittances are increasing for most countries of the Economic Community of West African States (ECOWAS1); therefore, they are likely to contribute towards poverty reduction and economic growth when channelled into productive investment activities. For instance, Nigeria is the largest remittance recipient in SSA, having received up to US$22 billion in 2017; the country ranks among the top 5 recipients globally (World Bank, 2018). Meanwhile, the amount of remittances received by other countries within the sub-region, including Ghana, Senegal, Mali, and Togo, is a bit significant but (far) less than the flows to Nigeria. Besides, the value of remittances received by countries in the ECOWAS area subsumes other sub-regional blocs within the SSA region such as the Southern African Development Community (SADC) and the East African Community (EAC) in multiple folds (Ajide & Raheem, 2016). Thus, making the ECOWAS an important sub-regional bloc in sub-Saharan Africa (SSA). In terms of remittances as a percentage of Gross Domestic Product (GDP), available statistics from the World Bank (2018) show high figures for some countries in the ECOWAS area. For instance, the share of remittances to GDP in the Gambia, Liberia, Cabo Verde, and Senegal in 2017 is 15.32%, 12.28%, 11.88%, and 10.62%, respectively.

Despite the potential benefits of remittances and the amount of such financial flows that many developing countries, particularly in the ECOWAS sub-region has been able to attract, growth in the sub-region is comparatively lower than the records for other sub-regional blocs of SSA. The growth statistics of the ECOWAS sub-region in the last few years have shown a disappointing history of poor economic performance. For instance, the average growth rate of the sub-region has declined consistently from 6.4% in 2012 to 2.5% in 2017 due to the negative growth recorded by Nigeria and Liberia (ECOWAS Commission Annual Reports, 2010 to 2016; ECOWAS Outlook, 2018). The average growth rate of the ECOWAS sub-region is reported inFigure 1.

Figure 1. Trends in the average growth rate of ECOWAS countries, 2008-2019 (% growth)
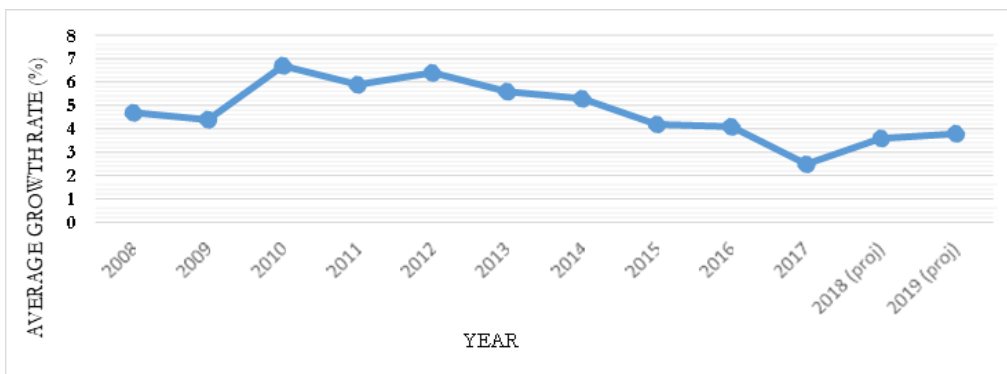
Source: Authors' drawing using underlying data from the ECOWAS Annual Reports, various issues.

Fig. 1 shows that the GDP growth rate of the ECOWAS sub-region from 2008 through to 2019 is below the 7% minimum requirement to achieve sustainable poverty reduction. From 4.7% in 2008, the rate dropped to 4.4% in 2009, implying that the economic and financial

crisis that affected virtually all countries might have caused a sharp decline in the average growth rate. Due to the prudent macroeconomic reform measures which were implemented by many countries, including those of the ECOWAS sub-region after the crisis, the average growth of the sub-region reached its all-time peak of 6.7% in 2010. Fig. 1 indicates a 5.9% decline in 2011 as a result of the political crises in Niger and Côte d'Ivoire. It also reports an upward trend with a value of 6.4% in 2012 as a result of the renewed dynamism experienced by the ECOWAS countries, particularly the discovery of oil and solid mineral resources in some countries as well as the recovery of Niger, Sierra Leone, and Côte d'Ivoire from their poor economic performance. However, from 2012 to 2017, the average growth rate in the sub-region declined consistently from 6.4% in 2012 to 5.6%, 5.3%, 4.2%, 4.1%, and 2.5% in 2013, 2014, 2015, 2016, and 2017, respectively. This decline occurred as a result of several challenges faced by many countries in the ECOWAS sub-region, including the political and security crises in Guinea Bissau, Mali, and Nigeria, effects of the Ebola epidemic, the sharp, unexpected, and persistent drop in oil prices, sharp depreciation of the Naira, and the 2016 economic recession in Nigeria, all of which have prevented exponential growth in the sub-region. Meanwhile, the average GDP growth rate has been projected to reach 3.6% and 3.8% in 2018 and 2019, respectively (ECOWAS Commission Annual Reports, 2010 to 2016).

Based on the aforestated statistics, the growth of the sub-region relative to the average growth in other developing areas has been declining and unsatisfactory, thereby making countries in the ECOWAS sub-region to continue to strengthen their policies aimed at building and maintaining a sustainable level of economic growth. The former, together with an increasing rate of poverty, has made countries in the area to attract external financial flows, including remittances, as a means of restoring their economies to a desirable position. However, despite the large amount of remittances received by many countries in sub-Saharan Africa and particularly those received by countries in the ECOWAS area, research efforts that examined the effect of remittances on the growth in sub-Saharan Africa countries have reported a weak, negative, or relatively insignificant average growth effect of remittances (see International Monetary Fund [IMF], 2005; Koyame-Marsh, 2012; Kumar, 2012; Olaniyan, 2019; Singh, Haacker, Lee, & Goff, 2010). Meanwhile, a few studies showed that remittances had positive effects on growth (for instance, Fayissa & Nsiah, 2010; Olayungbo & Quadri, 2019). Accordingly, the conflicting evidence on the remittances-growth relationship may be linked to the absence of important factors such as financial development and political, economic, and governance institutions, which matters in explaining such a relationship. It seems that remittances alone may not be strong enough to enhance economic growth (Adetou & Fiodendji, 2019; Jouini, 2015; Kratou & Gazdar, 2018; Olaniyan, 2019; Zghidi et al., 2018). This has prompted the need for studies to inquire further into the cause or reason for the pro-poor growth, which has continued to skyrocket in many developing African countries, most especially in the ECOWAS area. Empirical studies argue that the presence of weak governance, economic, and political institutions is responsible for the poor economic performance of the ECOWAS sub-region (for instance, Ajide & Raheem, 2016; Diop, Dufrenot & Sanon, 2010), whereas the studies of Adamu (2015) and Mahawiya (n.d.) attribute the pro-poor growth to the low level of financial sector development in countries of the sub-region. Hence, it can be said that the presence of imperfections in their financial systems limit private sector in accessing credit for investment in growth-enhancing projects. Based on the preceding, we set out to determine whether well-functioning financial sectors and the

presence of better governance institutions will magnify or weaken the effect of remittances on the growth of countries in the ECOWAS sub-region.

A wealth of empirical studies has shown that the effects of remittances on the economic growth of the recipient countries can be conditioned on the presence of well-developed financial institutions and strong governance, political, and economic institutions (see Adetou & Fiodendji, 2019; Bettin & Zazzaro, 2012; El Hamma, 2018; Ramirez, 2013; Yaseen, 2012). Consequently, the capacity of governance, political, and economic institutions to protect property rights, enforce laws, facilitate economic freedom, and reduce transaction costs make them important in attracting a large chunk of remittances to enhance economic growth (Bettin & Zazzaro, 2012; Zghidi et al., 2018). Given the preceding, there is a strong argument that countries with high-quality political and economic institutions are more likely to generate long-term growth effects of remittances (Acemoglu, Johnson & Robinson, 2001; Bonnal & Yaya, 2015; Catrinescu, León-Ledesma, Piracha & Quillin, 2009; Knack & Keefer, 1995). Theoretical foundations of the remittances-growth relationship under the condition of a low or high level of financial sector development and institutional quality can be found in studies[4] that discussed the complementarity and substitutability hypotheses. As a foretaste, the complementarity hypothesis indicates that high levels of financial development and institutional quality could boost the growth effects of remittances. In contrast, the substitutability hypothesis emphasises that remittances promote growth where the financial sector, governance, and economic institutions are weak and less efficient.

The motivation for this study is to provide an unequivocal analysis of the effect of remittances on economic growth in the ECOWAS area by employing financial development and institutional quality (IQ) measures, such as proxies for political, economic, and institutional risks to investigate the channel(s) through which remittances may promote economic growth in the area. Thus, it is crucial to determine the possible sources of heterogeneity in the relationship between remittance and growth in the presence/absence of financial development and institutional quality (IQ) in the ECOWAS area. The ECOWAS area is a major beneficiary of the remittances which flows to sub- Saharan Africa. Yet, countries in the sub-region are still at the early stages of development because they are not able to fully explore the potential benefits of remittances due to a low level of financial sector development and the presence of weak institutions as insinuated in some quarters. We focused on the ECOWAS sub-region for two reasons. First, the literature on remittance inflows to developing countries around the world has continued to gain considerable attention; yet, the majority of empirical studies have focused on the direct effect of remittances on economic growth (for instance, Das, McFarlane & Jung, 2019; Fayissa & Nsiah, 2010; Koyame-Marsh, 2012). Nonetheless, the roles of financial development and institutional quality (IQ) in the remittances-growth relationship from the developing countries' perspective (particularly in the ECOWAS sub-region) have not received so much attention in the literature. Thus, the effect of remittances on economic growth in the ECOWAS area through a combination of institutional channels remains underexplored.

Based on the preceding, we predict that the economic and financial crisis that occurred during the period 2007 to 2009 could have a harmful effect on the economic growth of remittance recipients' countries in the ECOWAS sub-region, for instance, where migrants suffer from job

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[4] We refer our readers to Bettin and Zazzaro (2012), Catrinescu *et al.* (2009), Giuliano and Ruiz-Arranz (2009); Mundaca (2009); Singh *et al.* (2010); Ramirez (2013) for further exposition.

losses in their host country as a result of the crisis, thus narrowing the possibility of sending funds to their family members (reference made to Allen & Giovanneti, 2010; Kratou & Gazdar, 2018). The cost of remitting funds can also increase during the crisis period, thereby forcing migrants to remit only what they can afford to bear the cost. Meanwhile, we also account for the potential endogeneity of remittances, which has been ignored in many studies that investigated the subject matter by employing the Two-Stage Least Squares Instrumental Variables (2SLS/IV) estimator. Second, despite the large volume of remittance inflows to the countries in the ECOWAS area, their output growth is mainly uneven and slowed down. On the one hand, Ajide and Raheem (2016) argue that the existence of a prevalent weak governance structure coupled with the severity of institutional infrastructure decay within the area is responsible for such poor performance. On the other hand, Ratsimalahelo and Barry (2010) note that though the ECOWAS countries practice the dual financial systems which have the fusion of formal and informal financial sectors, the finance-growth relationship of countries in the sub-region varies even at their similar stages of development due to country-specific policies and institutional differences. Thus, there is the need to validate or refute the assertions mentioned above on the empirical fronts by providing further evidence regarding the role of financial development and institutional quality (IQ) in sharpening or weakening the effect of remittances on the growth of countries in the ECOWAS sub-region.

Extant literature showed that the effects of remittances on economic growth differ across countries, implying that the results of many studies may have been highly influenced by the estimator used, the sample period, or region analysed, the country diversity in terms of strong financial development, good institutional quality, strong bank efficiency as well as observed and unobserved country-specific effects and the endogeneity of regressors used. Existing studies on the ECOWAS sub-region have investigated the direct effect of remittances on growth (Koyame- Marsh, 2012; Singh et al., 2010), whereas the role of financial development and the level of institutional quality in influencing the effect of remittances on economic growth in the ECOWAS sub-region is relatively under-explored. The review of the literature showed that the study of Adetou and Fiodendji (2019) provides initial evidence for the sub-region using the dynamic panel threshold analysis. Nevertheless, the consideration in the study is not only narrow but also ignored the possible negative effect of the 2007 to 2009 economic and financial crisis on the relationship between remittances and economic growth in the ECOWAS sub-region. All the same, it is critical to determine whether the relationship between these variables is subject to the estimation techniques and period considered. This study also distinguishes itself from the work of Adetou and Fiodendji (2019) by investigating the effect of the economic and financial crisis of 2007 to 2009 on the relationship between remittances and economic growth in the ECOWAS sub-region. We, therefore, examine how financial development and institutional quality influence the effect of remittances on the economic growth of recipient countries in the ECOWAS sub-region by using the Two-StageLeast Squares (2SLS/IV) instrumental variables estimator to account for the potential endogeneity of remittances. More specifically, we emphasise on the relationship between the variables by incorporating a couple of interaction terms of remittances, financial sector development, and institutional quality measures to check the robustness of the estimates. We provide richer insights into the relationship between the variables in the ECOWAS area, disaggregating institutions into its economic, political, and institutional components.

We organised the rest of this paper as follows: Section 2 discusses the theoretical perspectives in light of the debate on the remittances-growth relationship. Section 3 presents the data and

methodology. The empirical results are presented in Section 4 presents, while Section 5 concludes the paper with implications and future directions.

Theoretical perspectives

Complementarity hypothesis

The complementarityhypothesis was propounded by Mundaca (2009). The hypothesis posits that the effect of remittances on economic growth is positive and stronger at a high level of financial development and institutional quality. On one side, the hypothesis assumes that remittances and financial development support (complement) each other in enhancing economic growth, since cash remittances to migrants' in the home countries are cheaper, faster, and safer in the presence of a high level of financial development. In this manner, a large chunk of remittances that passes through the banking channels to the receiving households help to smoothen their consumption and enhance investment in growth-enhancing projects (Kumar, Hossain, & Osmani. 2018). On the other side, the hypothesis assumes that remittances and institutional quality are complements in promoting economic growth, such that the presence of more stable, strong, and sound institutions is essential to foster the effect of remittances on economic growth (Catrinescu et al., 2009; Kratou & Gazdar, 2018; Singh et al., 2010). The studies of Acemoglu et al. (2001) and La Porta et al. (1997) argue that better institutions matter most for enhancing economic growth. In another exposition, Bettin and Zazzaro (2012) opine that remittances can be used to improve the education of young members of the recipient families and to establish entrepreneurial activities in countries where strong political and governance institutions exist. The general notion is that the effects of remittances on the economic growth of recipients' countries seem to be more pronounced only in countries with well-functioning banking systems and sound governance institutions.

Substitutability hypothesis

Thesubstitutability hypothesis is credited to Giuliano and Ruiz-Arranz (2009). On the one hand, the hypothesis proposes that remittances can be an important source of financing growth-enhancing activities in countries with inefficient or poorly developed (shallow) financial sectors, mainly when these remittances serve as a substitute where institutions in the financial sector (notably, banks) have failed in their expected role of providing funds for entrepreneurial and productive activities (Ramirez, 2013). Furthermore, it stressed that the remitted funds which pass through the financial sector could substitute for the absence of banks' credit or the high-interest rate required for borrowing; thus, the recipients of remittances can make use of such funds for more productive and growth-enhancing activities or may be pledged as collateral for banks' credit (Bettin & Zazzaro, 2012). It also assumes that the effect of remittances on economic growth is more pronounced in less financially developed countries, where banks are weak in providing adequate funds for productive activities; hence remittances act as substitutes for financial development in promoting economic growth.

On the other hand, the hypothesis assumes that remittances can substitute for weak political, economic, and governance institutions, wherefore, recipients of remittances might be quick to invest remitted funds productively when institutions are weak and unreliable to overcome poor property rights and the absence of price and monetary stability (Bettin & Zazzaro, 2012;

Ramirez, 2013). Remittances, therefore, can serve as a substitute for the presence of weak institutions, since financially-constrained households with potentially productive investment projects are not able to borrow from the poorly developed domestic credit markets or at least borrow at a large premium over the risk-adjusted interest rate (Bettin & Zazzaro, 2012).

The review of empirical studies can be classified into two separate strands. In the first strand, most empirical studies focused on the interaction between remittances and financial institutions in enhancing economic growth or otherwise. In contrast, studies in the second strand emphasised on the conditional roles of financial development, political, and economic institutions in magnifying the effects of remittances on economic growth or otherwise.

A wealth of empirical studies which followed a panel data strategy have documented evidence to support the complementarity hypothesis, stressing that financial sector development complements remittances in enhancing economic growth, since the interaction term of remittances and financial development has a positive effect on the growth of the Middle East and North Africa (MENA) countries, Latin America countries (LAC) or developing countries in the African region and beyond (see Abida & Sghaier, 2014; Bangake & Eggoh, 2019; El Hamma, 2016; Fahrani & Béjaoui, 2019; Lartey, 2011; Mundaca, 2009; Nyamongo et al., 2012). In line with the complementary hypothesis, the country-specific studies of Jayaraman, Choong, and Kumar (2016), Ofori, Peprah, and Asomani (2019); Olaniyan (2019), Sibindi (2014) reported that remittances complement rather than substitute financial development for promoting growth in India, Ghana, Nigeria, and Lesotho, respectively. Contrarily, some panel studies have shown support for the substitutability of remittances and financial development in promoting economic growth, for example, Giuliano and Ruiz-Arranz (2009), Olayungbo and Quadri (2019), and Sobiech (2019) found that the development of the local financial sector influences developing countries capacity to take advantage of remittances. Furthermore, Jayaraman et al. (2018) and Ramirez and Sharma (2009), in a study of five Pacific Island countries and 23 selected LAC countries, respectively, showed that remittance inflows act as substitutes for financial sector development in enhancing growth. Likewise, a study by Jayaraman, Choong, and Kumar (2010) in Tonga showed evidence to support the substitutability hypothesis. The studies of Chen and Jayaraman (2016) and Uddin and Sjö (2013) also support the substitutability of remittances for the shallow financial systems in Fiji and Bangladesh, respectively. Meanwhile, Chowdhury (2016), in a sample of 33 top remittances-recipient developing countries, showed that financial development neither works as a substitute or a complement in promoting economic growth.

A couple of empirical studies have shown that the presence of suitable institutional environments such as strong governance and democratic systems, sound economic institutions and conditions, a low level of ethnic tensions, and the prevalence of law and order are essential conditions for enhancing the growth effects of remittances in emerging and developing countries, thus supporting the complementarity hypothesis (see Catrinescu et al., 2009; Chitambara, 2019; Driffield & Jones, 2013; Ruiz, Shukralla, 2016; Williams, 2017; Zghidi et al., 2018), whereas, a pool of empirical studies on developing countries have documented that remittances enhance growth but the effect declines with a high degree of financial development, meanwhile, remittances have a more significant impact on economic growth in countries with high-quality institutions (see Calderon, Fajnzylber & Lopez, 2008). El Hamma (2018) and Yaseen (2012), in studies conducted for the MENA countries, showed that strong institutional environments and financial development play important roles in how remittances

affect economic growth, thus supporting the complementarity hypothesis. The presence of a high-quality institutional system and well-developed credit market enhance the positive effect of remittance on the economic growth of developing countries; hence, remittances are complemented by financial development and institutional quality in promoting economic growth (see Bettin & Zazzaro, 2012; Bjuggren, Dzansi & Shukur, 2010; Kratou & Gazdar, 2018). Conversely, Ramirez (2013) studied 23 LAC countries and reported that remittances as substitutes for the role of financial, economic, and political institutions in promoting economic growth. In a related study for the ECOWAS sub-region, Adetou and Fiodendji (2019), using a dynamic panel threshold model, showed that financial development complements remittances in supporting economic growth. In contrast, remittances substitute for the prevalence of weak institutional environments in enhancing sustainable growth in the sub-region.

Methodology and data

In light of the first objective, we perform the first estimation from Eq. (1) to determine the extent to which remittance inflows enhance economic growth of recipient countries in the ECOWAS sub-region, and perhaps the negative effect of the 2007 to 2009 economic and financial crisis. The equation is as follows:

$$GDPg_{it} = \alpha_i + \delta_1 \operatorname{Re}m_{it} + \beta X_{it} + \theta Crisis_{it} + \eta_t + v_i + \varepsilon_{it} \ (1)$$

where GDPg_{it} represents the contemporaneous real GDP capita growth in the ith country; REM$_{it}$ refers to the ratio of remittances to GDP; X is the vector of control variables; Crisis is used as a dummy variable to capture the effect of the 2007 to 2009 economic and financial crisis; η_t is the time-specific effect; v_i is an unobserved country-specific fixed effect, and ε_{it} is the error term for each observation.

In line with the second objective, we estimate Eq. (2) to examine the role of financial development in influencing the effect of remittances on the economic growth of recipient countries in the ECOWAS sub-region. To achieve this, an interactive term of remittances and measures of financial development (REM×FINDEV) in addition to each variable separately is included in the regression. The equation is stated as follows:

$$GDPg_{it} = \alpha_i + \delta_1 \operatorname{Re}m_{it} + \delta_2 FinDev_{it} + \delta_3 (\operatorname{Re}m_{it} * FinDev_{it}) + \beta X_{it} + \eta_t + v_i + \varepsilon_{it} \ (2)$$

In equation 2, the signs of the coefficient δ_1 and δ_3 are important. Three possible outcomes are expected.

If $\delta_1 > 0$ and $\delta_3 < 0$, it will be interpreted that remittances enhance growth only in recipient countries where the financial sector is weak. A negatively signed interaction term implies that remittances and financial development are substitutes in promoting economic growth. If $\delta_1 < 0$ and $\delta_3 > 0$ or where both are positive, it implies that remittances alone affect economic growth negatively or positively, respectively. Meanwhile, the presence of a well-developed financial sector would enhance remittances to support economic growth. This means that a positively signed interactive term means that remittances and financial development are complements in promoting economic growth. Lastly, if δ_3 is non-significant, it implies that the variables are independent of each other in promoting economic growth

To achieve the third objective, we estimate Eq. (3) to reveal whether institutional quality influences the effect of remittances on the economic growth of recipient countries in the ECOWAS area. To accomplish this, an interactive term of remittances and measures of institutional quality (REM×INST) in addition to each variable separately is incorporated in the regression. The equation is given as:

$$GDPg_{it} = \alpha_i + \delta_1 \text{Re} m_{it} + \delta_2 InstQ_{it} + \delta_3 (\text{Re} m_{it} * InstQ_{it}) + \beta X_{it} + \eta_t + v_i + \varepsilon_{it} \quad (3)$$

This study relies on the signs of the coefficient δ_1 and δ_3. If $\delta_1 > 0$ and $\delta_3 < 0$, then remittances affect economic growth positively, but the presence of weak political and economic institutions affect such a positive relationship. In this case, remittances promote the growth of countries where the quality of institutions is weak. At the same time, If $\delta_1 < 0$ and $\delta_3 > 0$ or where both are positive, it implies that the presence of strong political and economic institutions lead remittances to promote economic growth. Thus, institutional quality acts as a complement to remittances in enhancing economic growth. In contrast, if δ_3 is non-significant, it implies that the variables of interaction are mutually exclusive in promoting economic growth

Using principal composite analysis, we construct a composite index to measure institutional quality (IQ). For robustness checks and validation of estimates, the measures of institutional quality are the index of political, economic, institutional risks together with their aggregate risk. Political stability and voice and accountability are two sub-indicators that make up political risk; the economic risk index is made up of regulatory quality and government effectiveness; while the institutional risk index is made up of the rule of law and control of corruption (Kaufmann, Kraay & Mastruzzi, 2011). We included a couple of control variables, such as the logarithm form of the initial level of GDP per capita, trade openness, government consumption, and inflation, which are standard in growth literature. The choice of control variables included in this study is mainly guided by extant studies (Barro, 1996; Frankel & Romer, 1999).

The variables used in this study are described in Table.

A priori expectation

The *a priori* expectation is the expected outcome of independent variables in the regressions. As shown in column four of Table 2, we expect a positive outcome to occur for an independent variable when $\gamma > 0$, implying that the variable will positively affect economic growth. In contrast, a negative outcome occurs for an independent variable when $\gamma < 0$, meaning that the variable will negatively affect economic growth. In whatever way, the expected signs for the variables are in line with extant empirical studies as well as theories.

Table 2 presents the variables, their proxies, the unit of measurement, expected relationship, and the supporting literature.

We employed the robust Two-Stage Least Squares (2SLS/IV) instrumental variables estimator developed by Anderson and Hsiao (1982). The technique helps to formally address the hypothesised endogeneity of remittances in estimating the regressions (El Hamma, 2018). It also takes care of data-related issues such as measurement error, simultaneity and omitted

Table 1. Variables description, their measurements, and sources

Variables	Description	Measurements and/or Sources
Economic Growth	It shows the level of economic productivity in a country. It is a continuous process that ensures a change in a country's economic condition towards a better condition for a certain period.	Economic growth is the dependent variable, and it is measured as the annual percentage growth rate of real GDP per capita (in constant 2010 US dollars). The data was obtained from the World Bank's World Development Indicators (WDI) Database.
Remittances	Remittances are the sum of the receipts of three aggregates: Workers' remittances, compensation of employees, and migrants' transfers.	Remittances represent the main variable of interest. Two measures are used, including the main measure: Remittances as a percentage of GDP, while remittances per capita serve as an alternative measure. The data were taken from the World Bank's Economic Outlook (WEO) Database.
Financial Development	This study is motivated to use the quantity-based proxy (an indicator of financial institution depth) to measure financial development because the depth of the financial sector signifies how effective the sector has been able to perform its intermediary functions efficiently.	Two measures are used to include the main measure: Domestic credit provided by the financial sector (% of GDP), while bank credit to the private sector (% of GDP) is used for robustness check. The data were collected from the World Bank's World Development Indicator (WDI) Database.
Institutional Quality	The composite index of political risk is made up of two sub-indicators, which are the political stability and voice and accountability; economic risk index is made up of regulatory quality and government effectiveness; institutional risk index is made up of t h e rule of law and control of corruption (Kaufmann *et al.*, 2011). In every case, the lower the risk point total, the higher the risk, and vice versa.	Three indicators are used, the index of political risk (POL) serves as the main measure, while the indexes of economic risk (ECON) and institutional risk (INST) serve as alternative measures. The data were sourced from the World Governance Indicators (WGI) Database.
Inte racti on Ter ms	The interactive terms serve as a pointer to the effect of remittances on economic growth using financial development and institutional quality as conditioning variables. This is to test whether remittances and financial development and remittances and institutional quality are substitutes or complements in the growth-enhancing process.	The study included several interactive terms, but the main variables of interaction are remittances and financial development, as well as remittances and institutional quality.
Control Variables:		
Initial level of GDP Per capita (log)	The initial level of real GDP per capita was included as a control variable to check for economic convergence. Thus, the hypothesis that the per capita incomes of poorer economies tend to grow at faster rates than the richer economies is tested.	It is measured as the logarithmic value of the one-period lagged value of GDP per capita growth
Trade Openness	It represents the openness of the domestic economy to trade with the rest of the world. It is the ratio of a country's total trade, and it measures the intensity of trade volumes.	It is measured as the total sum of exports and imports relative to the total output (GDP). The data was gleaned from the World Bank's World Development Indicator (WDI) Database.
Government Consumption	It represents the critical role of government in magnifying economic productivity. It shows the size of the government activities relative to the entire economy. It includes all government current expenditures for purchases of goods and services.	It is measured the general government final consumption expenditure relative to GDP. The data was drawn from the World Bank's World Development Indicator (WDI) Database.
Inflation	It is an indicator of macroeconomic stability. A high level of inflation can distort the decisions of economic agents', such that it discourages financial intermediation and encourages savings in real assets, which affects economic growth.	It is measured as the annual percentage growth rate of the GDP implicit deflator. The data was collected from the World Bank's World Development Indicator (WDI) Database.
Crisis Dummy	This is a dummy variable that represents the period of the economic and financial crisis, which affected virtually all ntions of the world.	It takes the value of 1 for the period 2007 to 2009 and 0 otherwise.

Source: Authors' compilation from the literature review.

Table 2. Variable properties, expected signs, and supporting literature

Variables	Code	Unit of Measurement	Expected Sign	Supporting Literature
Remittances: Remittance inflows	REM	% of GDP	$\gamma < 0$ or $\gamma > 0$	Adetou and Fiodendji (2019); El Hamma (2018); Ofori *et al.* (2019).
Remittances per capita	RPC	US Dollars	$\gamma < 0$ or $\gamma > 0$	Kratou and Gazdar (2018); Singh *et al.* (2010).
Financial Development: Domestic credit from the financial sector	DCFS	% of GDP	$\gamma > 0$	Kratou and Gazdar (2018); Adetou and Fiodendji (2019).
Bank credit to the private sector	DCPS	% of GDP	$\gamma > 0$	Kratou and Gazdar (2018).
Institutional Quality: Political risk index	POL	Ranges from -2.5 to 2.5*	$\gamma > 0$	Adetou and Fiodendji (2019); El Hamma (2018); Kratou and Gazdar (2018).
Economic risk index	ECON	Ranges from -2.5 to 2.5*	$\gamma > 0$	Kratou and Gazdar (2018).
Institutional risk index	INST	Ranges from -2.5 to 2.5*	$\gamma > 0$	Adetou and Fiodendji (2019).
Control Variables: Initial level of GDP per capita	GDP_{t-1}	One-period	$\gamma < 0$ or $\gamma > 0$	Kratou and Gazdar(2018); Adetou and Fiodendji (2019).
Openness	OPEN	% of GDP	$\gamma > 0$	Lartey (2011); Ramirez (2013); Singh *et al.* (2010).
Government consumption	GEXP	% of GDP	$\gamma < 0$ or $\gamma > 0$	Adetou and Fiodendji (2019); El Hamma (2018); Lartey (2011).
Inflation	INF	% growth	$\gamma > 0$	Kratou and Gazdar (2018); Adetou and Fiodendji (2019).
Dummy for crisis	Crisis	Binary code	$\gamma > 0$	Kratou and Gazdar (2018).

Source: Authors' compilation from the literature review. Notes: * implies that the countries with the value of -2.5 have the weakest institutions, and 2.5 is otherwise. RPC is measured in US Dollars to ensure a common comparison among the ECOWAS countries.

variable bias, multicollinearity, and heteroscedasticity problems in the regressions by staging instrumental variables. A couple of studies in the third strand of extant studies reviewed are plagued with these issues, particularly potential endogeneity problems.

The 2SLS/IV estimator is appropriate in dealing with the anxiety over endogeneity problems, which results from reverse causality because remittances may be effective for reducing income volatility, promoting the local financial sector, and increasing the quality of institutions (El Hamma, 2018). The estimator produces consistent and information efficient regression estimates. Remittances can be endogenous and are likely to be determined together with economic growth. On that account, the 2SLS/IV estimator, which allows the use of internal instruments based on the initial values of the dependent variable and independent variables, is employed to assuage the anxiety over the endogeneity problem. The internal instrumental variables which are assumed to be weakly exogenous are the lagged levels of differenced series, while level series are instrumented with their lagged differences (Bettin & Zazzaro, 2012; Williams, 2017). To validate the results from the 2SLS/IV estimations, the study performs a battery of post-estimation tests, such as the tests of endogeneity and weak instruments test, as well as the tests for the over-identifying restrictions. The Durbin-Wu-Hausman test proposed by Hausman (1978) and Wu (1974) is used to determine whether remittances are endogenous regressors. In contrast, the Sargan statistics are used to test the over-identifying restrictions for exogeneity.

Model estimations: Constructing the composite index for measures of institutions

Table 3. Summary results of the first principal components for institutions

		Component Matrix			
Country	First Principal Component (% of Variance)	POL	ECON	INST	**Eigenvalue** AGG
Benin	51.88	1.11592 1.53	263	1.27687	3.11296
Burkina Faso	48.69	1.54251 1.05	663	1.46988	1.84452
Cabo Verde	86.22	1.21216 1.43	289	1.28545	2.92163
Côte d'Ivoire	59.73	1.85155 1.92	309	1.88971	5.17303
Ghana	38.34	1.39618 1.60	421	1.73432	3.58366
Guinea	55.13	1.47681 1.31	946	1.09532	2.30058
Guinea Bissau	50.29	1.69339 1.67	755	1.82822	3.30764
Liberia	84.79	1.63641 1.29	021	1.51116	3.01761
Mali	66.50	1.79482 1.63	546	1.94852	5.08719
Niger	52.13	1.87781 1.26	636	1.43003	3.99000
Nigeria	45.64	1.49730 1.14	699	1.23633	3.12786
Senegal	57.52	1.19212 1.25	946	1.68595	2.73842
Sierra Leone	66.14	1.05519 1.12	524	1.84567	3.45142
Togo	52.06	1.92792 1.43	893	1.26425	3.96842
		1.09365 1.43	891	1.72655	3.12335

Source: Authors' computation with underlying data from the World Governance Indicators (WGI) database. **Note:** POL = index of political risk; ECON = index of economic risk; INST = index of institutional risk; AGG = aggregate index of the institutional variables.

We construct the composite index to measure institutions by employing the Principal Component Analysis (PCA). The process involves the transformation of many correlated sets of variables into a smaller number of uncorrelated variables. It reduces data sets to lower dimensions of observed variables while retaining as much information from the original set of variables as possible. Using the original form of six measures of institutions, such as political stability, voice and accountability, control of corruption, the rule of law, government effectiveness, and regulatory quality to construct three main components and then the 'aggregate' index, the first principal components were extracted as the composite index of political, economic, and institutional risks. Table 3 presents the summary result of the first principal components for each country in the sample.

Descriptive statistics

This study presents the results of the descriptive statistics, which include the mean, standard deviation, minimum values, and maximum values for the dependent variable and independent variables, respectively.

Table 4. Results of descriptive statistics

Variable	Observations	Mean	Std. Dev.	Min	Max
GDPG	269	1.768	4.384	-31.333	21.028
REM	263	4.929	4.312	0.039	21.81
RPC	263	53.998	79.891	0.142	427.832
DCFS	268	27.398	21.924	3.024	120.545
DCPS	268	5.725	12.402	0.204	65.278
POL	270	-2.77	0.974	-3.42	2.435
ECON	270	1.99	0.974	-2.399	2.722
INST	270	1.24	0.974	-2.145	2.523
AGG	270	2.06	0.974	-2.559	2.722
OPEN	270	68.399	37.788	7.146	311.354
GEXP	263	13.953	8.104	0.952	74.270
INFR	269	7.05	12.454	-7.901	100.627

Source: Authors' computation with underlying data from the WGI and WDI databases. **Note:** GDPG = real GDP per capita growth rate; REM = remittance inflows as a percentage of GDP; RPC = remittances per capita; DCFS = domestic credit by the financial sector; DCPS = domestic credit to the private sector; POL = index of political risk; ECON = index of economic risk; INST = index of institutional risk; AGG = aggregate index of the institutional variables; OPEN = trade openness; GEXP = government final consumption expenditure; INFR = GDP deflator.

Table 4 reports the results of the descriptive statistics for the variables of interest in the study. The mean value of economic growth (GDPG) reveals a low figure of 1.768, suggesting that the average growth rate in the ECOWAS sub-region may have declined as the sub-region witness population growth. In contrast, its standard deviation with a record of 4.384 and above the mean value implies that growth in the sub-region seems to be volatile, and member countries of ECOWAS had experienced a disproportionate growth rate for the period reviewed. Remittances, as a percentage of GDP (REM), show a low mean value of 4.929, and a minimum value of 0.039 was reported for Guinea-Bissau. Thus, implying that the chunk of remittances received by many countries in the sub-region, particularly Guinea-Bissau, has not enhanced economic growth as much as the experience of other developing remittances recipients around the world. Remittances as a ratio of the total population (RPC) is the most volatile variable, showing the highest standard deviation with a value of 79.891, implying that the portion of remittances received by member countries of ECOWAS relative to the population of each country varies widely because of the large population disparities in the sub-region. Thus, making remittances per capita to be high for some countries and low for the others. The low minimum values of 3.024 and 0.204 for domestic credit provided by the financial sector (DCFS) and domestic credit to the private sector by banks (DCPS), respectively, implies that the level of financial development is still low, particularly for Nigeria and the Gambia as member countries of ECOWAS. Based on the indices constructed through the PCA, which are also described in Table 3, the measures of institutions, including political risk, economic risk, institutional risk, and aggregate risk indices show mean values of -2.77, 1.99, 1.24, and 2.06. Finally, inflation measured as GDP deflator fluctuates more rapidly in the ECOWAS sub-region, as indicated by the higher value of its standard deviation (12.454) over the average inflation rate of 7.05. In contrast, negative inflation rates were recorded for some member countries, including Togo, Burkina Faso, and Guinea Bissau.

Correlation analysis

The results of the correlation analysis conducted to determine the relationship between the variables in the study as fully presented in the Appendix. It shows the strength of the

relationship between the independent variables as well as between the dependent variable and independent variables. The correlation coefficient ranges from -1 to +1, while - 1 indicates a perfect negative correlation, +1 implies that a perfect positive correlation.

The results of the correlation analysis, as reported in the Appendix, show that there is the presence of correlation between the independent variables; however, the direction of the relationship varies. There is a negative correlation between the dependent variable (real GDP per capita growth) and remittances as a percentage of GDP as well as between the dependent variable and inflation as depicted by their correlation coefficients that are reported as -0.0534 and -0.0086, respectively. Whereas, the other variables such as remittances per capita, domestic credit by the financial sector, domestic bank credit to the private sector, political risk index, economic risk index, institutional risk index, the aggregate index for governance institutions, crisis dummy variable, trade openness, government expenditure as well as inflation are positively correlated with real GDP per capita growth. The pair of remittances per capita and domestic credit to the private sector has the highest correlation value of 0.7583.

Results of the estimations

The models specified to investigate the relationship between remittances, financial sector development, institutions, and economic growth in the ECOWAS sub-region are estimated using the Two-Stage Least Squares Instrumental Variables (2SLS/IV) estimator. As a starting point, we conduct an estimation through which its first objective is achieved. This helps to identify the direct effects of remittances on the growth of member countries of ECOWAS. The results are fully presented in Table 5.

Table 5 shows the baseline results of the direct effects of remittance inflows on the economic growth of recipient countries in the ECOWAS sub-region over the period from 2000 to 2017[5], exempting financial development and institutional variables. It is important to stress that columns one and two are related to remittances as a percentage of GDP; columns three (3) and four (4) are related to remittances per capita, while columns two (2) and four (4) included crisis dummy variable. The dynamic behaviour of economic growth was captured with the initial value of GDP per capita (logarithm), and this helps to test the conditional convergence hypothesis of the neoclassical theorist, which states that poor countries with low initial GDP levels grow faster, enabling them to catch up with the richer countries. As shown in Table 5, the coefficients of the initial value of GDP per capita are positively signed across the four columns and significant at 5% level of significance. The coefficients are 1.919, 2.038, 1.514, and 1.517 for columns one (1) to four (4), in that order. Therefore, it suggests the absence of the conditional convergence hypothesis for the ECOWAS countries, implying that the initial value of GDP per capita does not determine the current level of economic growth. This finding agrees with the position of Adetou and Fiodendji (2019), Chowdhury (2016), Diop et al. (2010), and Driffield and Jones (2013) on the absence of the conditional convergence hypothesis, whereas Chitambara (2019) and Kratou and Gazdar (2018) reports the presence of conditional convergence hypothesis.

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[5] The period was chosen because of the lack of data, especially for institutional quality (IQ) measures for each country, which are only available from 1996. In most cases, there are no reliable values for 1997 and 1999. The decision to forge ahead is based on the availability of comprehensive data at the country-level. However, the period covers the pre- and post-economic and financial crises.

Table 5. Regressions on the remittances-growth effects in ECOWAS countries

(Dependent variable: GDP per capita growth, 2000-2017)

Variable	Column (1)	Column (2)	Column (3)	Column (4)
Log of GDP per	1.919**	2.038**	1.514**	1.517**
capita (initial)	(0.851)	(0.929)	(0.667)	(0.664)
REM	-1.254*	-1.373*	-	-
	(0.611)	(0.589)		
RPC	-	-	-0.011**	-0.012**
			(0.005)	(0.005)
OPEN	0.039*	0.043*	0.009*	0.010*
	(0.011)	(0.021)	(0.004)	(0.003)
GEXP	0.073	0.079	0.014	0.013
	(0.049)	(0.053)	(0.017)	(0.017)
INFR	-0.061	-0.068	-0.008	-0.009
	(0.046)	(0.049)	(0.022)	(0.022)
Crisis	-	-0.896***	-	-0.031*
		(0.047)		(0.015)
Constant	-8.306*	-8.625*	-8.526*	-8.538*
	(4.017)	(4.303)	(4.138)	(4.228)
Observations	254	254	252	252
Number of countries	15	15	15	15
Model Diagnostics				
Wald *F*-test	5.67{0.0393}**	5.25{0.0125}**	7.08{0.0147}**	7.17{0.005}***
Sargan test	1.75{0.625}	1.43{0.698}	5.34{0.148}	5.28{0.145}
Wu-Hausman test	3.487{0.03}**	3.577{0.05}**	3.706{0.02}**	5.64{0.02}**
Root MSE	1.7514	1.097	1.7429	1.7436

Source: Authors' Computation, (2019). **Notes**: ***, **, and * imply significance level of $p<0.01$, $p<0.05$, and $p<0.1$, respectively. The robust standard errors and *p*-values are reported in brackets () and parentheses { }, respectively. The lagged value of remittances is used as an instrument   because it is highly correlated with the current value and not connected to the error term (.

Starting with the main variable of interest, the estimated coefficients of remittances as a percentage of GDP are negative, the coefficients are reported as 1.373 and 1.254 for the regressions with and without crisis dummy variable in columns two (2) and one (1), respectively. It is evident that the variable is significant at a 10% level of significance in columns two (2) and one (1), respectively. This implies that a one-unit increase in the remittances as a percentage of GDP will lead to a decline in the level of economic growth in the ECOWAS countries by 1.254 units and 1.373 units as depicted in columns one (1) and two (2) in that order. This result is robust to an alternative measure of remittances (remittances per capita), which also revealed negative coefficients of 0.012 and 0.011 in the regressions with and without crisis dummy variable, respectively, and as presented in columns three (3) and four (4). Thus, the effects of remittances on growth for the group of West African countries is negative. This baseline result conforms to the negative findings of El Hamma (2016) and Kratou and Gazdar (2018), which showed that remittances do not enhance economic growth.

Regarding the control variables, trade openness across the columns showed positive coefficients of 0.039, 0.043, 0.009, and 0.01 for the first, second, third, and fourth regressions, respectively. This means that trade openness has a slightly positive and significant effect on the growth; hence further opening to trade will enhance the economic growth of member countries of ECOWAS countries. We provide evidence similar to Adetou and Fiodendji (2019), El Hamma (2018), and Chitambara (2019). The results in Table 5 also showed that an increase in government consumption expenditure drives growth in the ECOWAS sub-region, as revealed by the positively signed coefficients of 0.073, 0.079, 0.014, and 0.013 across

columns one (1) to four (4) in that order. Meanwhile, the effect is insignificant throughout, as revealed by the p-values, which are greater than the threshold significance level of 10%. The insignificant effect is consistent with the studies of Kratou and Gazdar (2018) but deviates from the negative outcome of Adetou and Fiodendji (2019). The estimated coefficients of inflation are negative and insignificant in the four columns. The coefficients are obtained as 0.061, 0.068, 0.008, and 0.009. Therefore, an increase in the level of inflation has a diminishing effect on the growth of countries in the sub-region.

The coefficients of the dummy variable for economic and financial crises showed a negative and significant effect on the growth of the ECOWAS countries, as reported in columns two (2) and four (4), respectively. The coefficients are obtained as 0.896 and 0.031. This suggests that the crisis has a devastating effect on the growth of the countries in the sub-region. These results support the earlier work of Allen and Giovanneti (2010) but differ from the report of Kratou and Gazdar (2018).

It is necessary to ascertain the robustness of the aforestated results as well as the significance of those outcomes for policy implications; hence we conduct a battery of model diagnostic tests as reported in the last four rows of Table5. From the results, the endogeneity of remittances was determined using the Durbin-Wu-Hausman test, which revealed p-values which are significant at 5% conventional level of significance across the four columns, suggesting the rejection of the null hypothesis that remittances are exogenous. Thus, remittances are ascertained as endogenous variables. The p-values of the Sargan statistics across the four columns are greater than the 10% level of significance, implying that the null hypothesis, which suggests that the over-identifying restrictions are valid, cannot be rejected. Therefore, the models in the regressions are correctly specified. The root mean square errors (RMSE) is relatively low across the four columns, implying that the regressions are valid.

Table 6 presents the results of the regressions, which revealed the role of financial sector development in influencing the effect of remittances on the economic growth of recipient countries in the ECOWAS sub-region. Columns one (1) to four (4) show the regressions which examined the second objective of this study regarding the contingent role of financial sector development in the remittances-growth relationship using comparable measures of remittances and financial sector development.

Similar to the previous results in Table 5, the initial value of GDP per capita has positive coefficients across the four columns (0.383, 1.260, 0.908, and 1.206), and this provides further evidence for the rejection of the conditional convergence hypothesis for the group of 15 ECOWAS countries. The coefficient of remittances as a percentage of GDP is negative (1.801). Its effect on growth is significant, as shown in column one (1) when financial sector development was measured using domestic credit provided by the financial sector, whereas the coefficient is negative (0.024) and insignificant using domestic credit to the private sector as an alternative measure of financial sector development. Accordingly, a one-unit increase in remittances as a percentage of GDP and as per capita leads to 1.801 units and 0.024 units decline in the economic growth of the ECOWAS area, as shown in columns one (1) and three (3), respectively. This suggests that the negative effect of remittances on economic growth seemed to be more pronounced where the entire financial sector is weak and not able to efficiently recycle the savings made by remittances recipients as credits to the financially constrained private sector. The result is partially in line with the argument of El Hamma (2018) and Kratou and Gazdar (2018).

Table 6. Remittances, financial sector development, and growth in ECOWAS countries (Dependent variable: GDP per capita growth, 2000-2017)

Variable	Column (1)	Column (2)	Column (3)	Column (4)
	DCFS	**DCFS**	**DCPS**	**DCPS**
Log of GDP per capita (initial)	0.383** (0.078)	1.260* (0.615)	0.908** (0.412)	1.206* (0.553)
REM	-1.801*	-	-0.024	-
	(0.865)		(0.128)	
REM*FINDEV	0.046* (0.022)	-	0.007* (0.003)	-
DCFS	0.322* (0.159)	0.012** (0.003)	-	-
RPC	-	-0.009	-	-0.005
		(0.104)		(0.010)
RPC*FINDEV	-	0.003** (0.001)	-	0.003** (0.001)
DCPS	-		0.064* (0.032)	0.015** (0.003)
OPEN	0.043*	0.005	0.009*	0.018**
	(0.021)	(0.012)	(0.004)	(0.005)
GEXP	0.032	0.008	0.012	0.018
	(0.031)	(0.018)	(0.018)	(0.005)
INFR	-0.013	-0.009	-0.009	-0.008
	(0.026)	(0.022)	(0.023)	(0.023)
Constant	-5.997	-6.814	-4.575	-6.459
	(7.237)	(4.696)	(3.735)	(4.307)
Observations	247	248	248	248
Number of countries	15	15	15	15
Model Diagnostics Wald *F*-test	7.61{0.0368}**	10.29{0.0172}**	6.59{0.0472}**	6.00{0.0396}**
Sargan test	12.75{0.147}	5.89{0.216}	34.82{0.756}	4.89{0.165}
Wu-Hausman test	4.85{0.0287}**	2.27{0.0167}**	4.88{0.035}**	5.31{0.0227}**
Root MSE	1.0736	1.7211	0.7226	1.7222

Source: Authors' Computation, (2019). **Notes:** ** and * imply the significance level of *p*<0.05 and *p*<0.1, respectively. The robust standard errors and *p*-values are reported in brackets ( ) and parentheses { }, respectively. The lagged value of remittances is used as an instrument because it is highly correlated with the current value and not connected to the error term. DCFS = domestic credit by the financial sector, DCPS = domestic credit to the private sector, while FINDEV is a representative of the individual measure of financial sector development.

The coefficient of the interactive term of remittances as a percentage of GDP with domestic credit by the financial sector is positive (0.046) and significant at a 10% level of significance, as shown in column one (1) of Table 6. The result is robust to the use of an alternative measure, DCPS, as reported in column three (3). These results suggest that the complementarity hypothesis, which states that remittances and financial sector development co-exist to enhance growth, is relevant for the group of West African countries. The outcome of this study conforms to the evidence from the studies of Adetou and Fiodendji (2019), Bettin and Zazzaro (2012), Kratou and Gazdar (2018), and Nyamongo et al. (2012).

As reported in columns one (1) and two (2), the coefficients of domestic credit by the financial sector (DCFS) are positive and significant, indicating that DCFS has an increasing effect on the growth of the ECOWAS countries. This means that domestic credit by the financial sector, which is targeted directly at investment activities, seems to have a growth-stimulating effect in the economies of the West African countries. This conforms to the results reported by Chitambara (2019), El Hamma (2018), and Olayungbo and Quadri (2019).

Remittances per capita have negative and insignificant coefficients of 0.009 and 0.005, as shown in columns two (2) and four (4), respectively. It suggests that remittances per capita do not promote economic growth in the ECOWAS area. The coefficient of the interactive

term of remittances as per capita with domestic credit by the financial sector is positive (0.003) and significant at a 5% level of significance, as shown in column two (2) of Table 6. The result is robust to the use of an alternative measure, DCPS, as reported in column four (4). These results, which are robust to the measurement of remittances as a percentage of GDP, provide further evidence to support the complementarity relationship remittances and financial sector development in promoting the growth of ECOWAS countries. It also confirms why the second hypothesis of the study should be rejected.

The coefficient of domestic credit to the private sector (DCPS) is positive and significant on the growth of the ECOWAS countries in columns three (3) and four (4). This means that domestic credit to the financially constrained private sector for productive investments has a growth-enhancing effect on the ECOWAS sub-region. Regarding the control variables, trade openness has a positive and significant effect on economic growth except in column two (2). In contrast, government consumption expenditure and inflation have positive and negative effects on the growth of member countries of ECOWAS across columns one (1) to four (4), respectively. In any case, the effects of government consumption expenditure and inflation on the growth of these countries are insignificant, as shown in Table 6. The results are consistent with the claim of Adetou and Fiodendji (2019), Chitambara (2019), and Kratou and Gazdar (2018).

Similar to the first estimation in Table 5, we determined the robustness of the aforestated results by performing a battery of model diagnostic tests as reported in the last four rows of Table 6. The results of the Durbin-Wu-Hausman test revealed that remittances are an endogenous regressor, as indicated by the p-values, which are significant at a 5% conventional level of significance across the four columns, respectively. Therefore, we reject the null hypothesis that remittances are exogenous variables. The p-values of the Sargan statistics across the four columns are greater than 10% level of significance, implying that the null hypothesis, which suggests that the over-identifying restrictions are valid, is non-rejectable. Thus, the models in the regressions are correctly specified. The root mean square errors (RMSE) are relatively low across the columns, indicating that the regressions are valid.

Table 7 reports the results of the regressions, which showed how institutional quality could influence the effect of remittances on the economic growth of recipient countries in the ECOWAS sub-region, in line with the third objective of this study. Columns one (1) to eight (8) contain information regarding the influence of institutional variables in the remittances-growth relationship by employing alternative measures of remittances and institutions. The conditional convergence hypothesis is rejected for the group of 15 ECOWAS countries because the initial value of GDP per capita showed positive coefficients across the eight columns, and the same result was obtained from the first two estimations in this study.

The coefficients of remittances as a percentage of GDP as shown in columns one (1), three (3), five (5), and seven (7) remain negative; nevertheless, its effect on growth is insignificant in the four columns. This result is robust to the alternative measure of remittances (as per capita), which also revealed a negative and insignificant effect on economic growth as shown in columns two (2), four (4), six (6), and eight (8), in that order. It suggests that an increase in remittances as a percentage of GDP and as per capita leads to a decline in the economic growth of countries in the ECOWAS area.

Table 7. Remittances, institutions, and growth in ECOWAS countries (Dependent variable: GDP per capita growth, 2000-2017)

Variables	Column (1)	Column (2)	Column (3)	Column (4)	Column (5)	Column (6)	Column (7)	Column (8)
	POL	POL	ECON	ECON	INST	INST	AGG	AGG
Log of GDP per	0.001*	0.001**	0.006**	0.003**	0.01**	0.002**	0.002*	0.011**
capita (initial)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.001)	(0.001)
REM	-0.102	-	-0.089	-	-0.112	-	-0.009	-
	(0.073)		(0.073)		(0.089)		(0.009)	
REM*INSTQ	-0.009**	-	-0.083**	-	-0.097***	-	-0.057**	-
	(0.002)		(0.006)		(0.002)		(0.021)	
RPC	-	-0.009	-	-0.011	-	-0.011	-	-0.007
		(0.007)		(0.007)		(0.008)		(0.006)
RPC*INSTQ	-	-0.004**	-	-0.023**	-	-0.007**	-	-0.052**
GEXP	0.005*	0.015**	0.014	0.021	0.032**	0.018	0.021	0.015
	(0.002)	(0.006)	(0.019)	(0.019)	(0.012)	(0.019)	(0.018)	(0.017)
INFR	-0.004	-0.003	-0.003	-0.004	-0.007	-0.006	-0.001	-0.001
	(0.020)	(0.198)	(0.022)	(0.022)	(0.023)	(0.023)	(0.022)	(0.022)
Constant	1.603**	0.889**	1.241*	0.789*	1.405**	0.592	0.517	0.727
	(0.744)	(0.083)	(0.531)	(0.359)	(0.702)	(0.849)	(0.731)	(0.825)
Observations	251	251	251	251	251	251	251	251
No of countries	15	15	15	15	15	15	15	15
Model Diagnostics								
Wald *F*-test	12.08{0.098}*	11.52{0.017}**	5.16{0.04}*	4.81{0.027}**	3.69{0.014}**	3.67{0.018}**	6.60{0.012}**	6.79{0.045}**
Sargan test	2.02{0.185}	20.35{0.162}	2.55{0.151}	2.23{0.101}	1.85{0.14}	1.62{0.121}	21.58{0.171}	2.42{0.1512}
Wu-Hausman test	7.75{0.048}**	3.63{0.033}**	1.20{0.013}**	6.50{0.042}**	4.02{0.045}**	6.17{0.043}**	3.21{0.046}**	1.52{0.017}**
Root MSE	1.72	1.7289	1.7612	1.7865	1.7757	1.7922	1.759	1.7616

Source: Authors' Computation, (2019). **Notes:** ***, **, and * imply the significance level of $p<0.01$, $p<0.05$, and $p<0.1$, respectively. The robust standard errors and *p*-values are reported in brackets ( ) and parentheses { }, respectively. The lagged value of remittances is used as an instrument because it is highly correlated with the current value and not connected to the error term. REM = remittance inflows as a percentage of GDP; RPC = remittances per capita; DCFS = domestic credit by the financial sector; DCPS = domestic credit to the private sector; POL = index of political risk; ECON = index of economic risk; INST = index of institutional risk; AGG = aggregate index of the institutional variables; CRISIS = dummy variable for the economic and financial crisis, 2007 to 2009; OPEN = trade openness; GEXP = government final consumption expenditure; and INFR = GDP deflator. INSTQ is a representative of the individual measure of institutional quality.

The coefficients of the separate index composed on institutional variables such as political risk index, economic risk index, and institutional risk index, as well as the aggregate index are positive across the eight (8) columns, but the level of their significance varies from 1% to 10% level of significance. Specifically, the coefficients are significant at 10% in column one (1), 1% in column six (6), and 5% for the other columns. This means that the presence of strong governance, political, and economic institutions are important drivers of the economic growth of countries in the ECOWAS sub-region. It agrees with the studies of Acemoglu *et al.* (2001), Chitambara (2019), and Kratou and Gazdar (2018).

The coefficients of the interactive terms of remittances as a percentage of GDP with the measures of institutions such as political, economic, and intuitional risks in columns one (1), three (3), five (5), and seven (7) show negative values. At the same time, their respective *p*-

values are significant at 5% level of significance except in column five (5). The interactive term of remittances as a percentage of GDP and institutional risk index is significant at 1% level of significance in column five (5). The results obtained are robust to remittances per capita as an alternative measure because the coefficients of the interactive terms of remittances per capita with the separate index for political risk, economic risk, institutional, risk, and their aggregate index are equally negative and significant at 5% level of significance. These results are reported in columns two (2), four (4), six (6), and eight (8), respectively.

Consequently, the study rejects the null hypothesis, which states that institutional quality does not significantly influence the effect of remittances on t h e economic growth of recipient countries in the ECOWAS sub-region. The negative coefficients of the interaction terms of remittances and institutional quality variables in columns one to eight imply that the variables are substitutes in promoting economic growth in the ECOWAS sub-region. Thus, remittances can substitute for the absence of strong political, economic, and governance institutions in the sub-region. These results conform to the finding of Adetou and Fiodendji (2019), Catrinescu *et al.* (2009), and Kratou and Gazdar (2018).

With regards to the control variables, trade openness has a positive and significant effect on economic growth except in the columns one (1) and two (2). In contrast, government consumption expenditure and inflation have positive and negative effects on the growth of member countries of ECOWAS across columns one (1) to eight (8), respectively. The effect of government consumption expenditure on the growth of these countries is significant at 10% and 5% significance level only in columns one (1), two (2), and five (5), respectively. In contrast, inflation has no significant effect on the growth of ECOWAS countries at any conventional level of significance.

The last four rows of Table 7 reports the battery of model diagnostic tests conducted to validate the results of the third estimation. The results of the Durbin-Wu-Hausman test confirmed remittances as an endogenous regressor because the *p*-values of the test across the columns are significant at a 5% conventional level of significance, leading to the rejection of the null hypothesis that remittances are exogenous variables. The *p*-values of the Sargan statistics across the four columns are greater than the 10% level of significance, implying that the null hypothesis, which suggests that the over-identifying restrictions are valid, cannot be rejected. Thus, the models in the regressions are correctly specified. The root mean square errors (RMSE) is relatively low across the four columns, implying that the regressions are valid.

Discussion and implication of findings

The discussion of findings and its implications for both theory and practice is provided as follows:

Initial level of GDP per capita (logarithm): The positive and significant results from the initial value of GDP per capita in Tables 5, 6, and 7 are similar to the findings of Adetou and Fiodendji (2019) and Driffield and Jones (2013). Therefore, we refute the conditional convergence hypothesis of the neoclassical theorists, which states that countries with a low initial level of GDP grow relatively fast. Thus, the argument that poor countries grow faster to catch up with the richer countries is rejected for the ECOWAS countries where divergence prevails because countries in the sub-region are still at the initial stages of development

(Mahawiya, n.d.). The finding implies that the ECOWAS countries will need to intensify policy efforts at improving their domestic economies by investing in social and economic infrastructure since it can increase the level of GDP per capita.

Remittances: As shown in Tables 5, 6, and 7, we find in all the regressions that remittances, either measured as a percentage of GDP or per capita, have negative coefficients, implying that remittances do not enhance growth in the ECOWAS sub-region. This means that remittances are predominantly used for consumption smoothing purposes, such that many households consider remitted funds as a substitute for labour income as well as an avenue to increase their leisure activities. This moral hazard problem affects labour productivity and economic growth negatively. It supports the finding of Singh et al. (2010) and Kratou and Gazdar (2018) but contradicts the positive evidence reported in the studies of Chitambara (2019) and Ramirez (2013). This finding implies that the ECOWAS countries will have to combat the resulting problem of unemployment created when the recipients see remitted funds as an opportunity to forsake their labour income.

Financial Sector Development: Using two measures of financial sector development as shown in Table 6, the study finds that the two measures have positive and significant coefficients, suggesting that financial sector development is crucial in promoting growth levels in the ECOWAS sub-region. Accordingly, recent developments in the financial sector, coupled with the innovative products which are emerging from the sector in ECOWAS countries, promote growth. This finding implies that the ECOWAS countries will need to further institute reforms to broaden the financial channels of growth through the help of their financial sector regulators4.

Institutional Quality: The results reported in Table 7 indicate that the measures of institutional quality have positive and significant effects on growth; hence the presence of strong political, economic, and governance institutions is important in promoting economic growth. It corroborates the claim of Acemoglu et al. (2001) that better quality of institutions has a desirable effect on the level of per capita income. It also supports the arguments of Bettin and Zazzaro (2012) that the presence of better quality institutions enhances the protection of property rights to boost the growth in an economy. This finding implies that the ECOWAS countries will have to seek permanent solutions to the problems of dysfunctional political, economic, and governance institutions in the sub-region to facilitate massive inflows of remittances to the ECOWAS area.

Crisis Dummy: In line with theoretical expectations, we show from the results in Table 5 that the global economic and financial crisis, which lasted from 2007 to 2009, has a negative and significant effect on the growth of the ECOWAS countries. This finding indicates that the crisis could have triggered an increase in the cost of remitting in migrants' host country or even lead to job losses, thereby causing a devastating effect both on the migrants themselves and the growth of their home countries. This contradicts the finding of Kratou and Gazdar (2018), who discovered that the crisis had a positive but insignificant effect on the growth of 30 African countries. This finding implies that countries of the ECOWAS will have to seek simultaneous macroeconomic measures to stimulate aggregate demand, repair banks' balance sheets to encourage them to provide credit to the economy, and revitalise trade and stabilise financial capital flows.

Interactive Terms: From Table 6, the interactions of remittances and measures of financial development (domestic credit by the financial sector and domestic credit to the private sector) is positive and significant, thus supporting the complementarity hypothesis and the empirical studies of Adetou and Fiodendji (2019), El Hamma (2018), Kratou and Gazdar (2018) and Ofori et al. (2019) but contradicts the finding of Ramirez (2013), Giuliano and Ruiz-Arranz (2009), and Sobiech (2019). The finding indicates that remittances and financial development complement each other in enhancing economic growth in the ECOWAS countries, hence increasing cash remittances to migrants' families become cheaper, faster, and safer in the presence of well-developed financial sectors, and this enhances investments in growth-enhancing projects. Meanwhile, Table 7 reports negative and significant results from the interaction of remittances with the measures of institutional quality (political, economic, and institutional risk indices). This finding lends credence to the substitutability hypothesis and is supported by the studies of Adetou and Fiodendji (2019), Catrinescu et al. (2009), and Kratou and Gazdar (2018). Therefore, remittances substitute for low institutional quality to promote economic growth in countries of the ECOWAS area since remittances recipients could utilise their funds for productive investments and think less of the poor state of governance institutions that occurred as a result of increased government corruption. Poor governance and corruption affect the quality of life for many countries in the ECOWAS sub-region; many families rely on their migrants' relatives for remittances to take care of their consumption and investment expenditures. Hence remittances serve as a substitute for the quality of institutions. This finding implies that policymakers of ECOWAS countries will have to seek simultaneous improvements in their financial sectors and institutional structures because this can help them maximise the growth benefits from remittances.

Government Expenditure: The results from Tables 5, 6, and 7 suggest that government consumption expenditure seemed to drive growth levels in the ECOWAS sub-region, notwithstanding the effect is rather insignificant except in Table 7. This outcome is similar to the finding from Kratou and Gazdar (2018). This finding suggests that the ECOWAS countries will have to reshape strategies to focus on capital expenditure that will have the most desirable effect on output growth.

Inflation: The results from Tables 5, 6, and 7 showed that inflation is consistently negative and insignificant in regressions; thus, inflation does not enhance economic growth in the ECOWAS countries since the level of instability in price levels distort economic activities and thus cause a decline in the real GDP per capita. Besides, a high level of inflation makes it difficult for investors to predict into the future; in this way, they are not encouraged to take long- term investment decisions. This finding implies that countries of the ECOWAS area need a well-regulated monetary policy because a stable and low inflation rate can attract more remittances.

Trade openness: The positive results in Tables 5, 6, and 7 suggest that further opening to trade is an important factor needed to promote the economic growth of the ECOWAS countries, thus providing empirical support for the recent studies of Adetou and Fiodendji (2019), Kratou and Gazdar (2018) and Chitambara (2019). This finding implies that the ECOWAS countries should see trade openness as an important channel of economic growth because it affects the demand for external finance such as remittances and deepens the financial sector of the trading countries.

Conclusion

A large volume of remittances pass through the informal and unlicensed remitting channels; remittances will be able to trigger entrepreneurial activities further and growth-enhancing investments when institutions in the financial sector, particularly banks, can channel more remittances than the unlicensed money transfer operators. That being said, we conclude that remittances themselves do not promote growth because they have a negative effect on the economic growth of the member countries of ECOWAS, in line with the conclusions in the studies of Jouini (2015); Kratou and Gazdar (2018); Zghidi et al. (2018). The study further concludes that remittances tend to promote economic growth in the presence of a well-developed financial sector. Besides, remittances substitute for the presence of weak institutions in the ECOWAS sub-region. However, there is a need to seek simultaneous improvements in the financial sector and institutional developments to maximise growth benefits from remittances.

The developmental benefits of remittances to developing countries, particularly in sub-Saharan Africa, is conditioned on the presence of well-developed financial institutions and strong governance institutions. The economic and financial crisis of 2007 to 2009 has a negative effect on the relationship between remittances and growth. The study takes the lead from the study of Kaufmann et al. (2011) to construct a composite index for political, economic, and institutional risks, respectively, by re-grouping the six world governance indicators such as political stability, voice and accountability, control of corruption, the rule of law, government effectiveness and regulatory quality as described earlier.

First, the negative effects of remittances on economic growth in the ECOWAS sub-region could be curtailed by setting policies to decrease the transaction cost of transfers and further deepen the role of the financial sector, particularly by increasing the level of the remitting activities of banking institutions, since it will enhance efficient channeling of savings made from the remitted funds of recipients into productive investments. Furthermore, the consumption smoothing drive of remittances recipients' could be minimised by motivating them, for instance, increasing the payment of savings interests' on the funds remitted to them by their families and friends. Second, the positive effect of institutional quality components and its aggregate on growth suggests the need for an improvement in the operations of governance institutions because their activities are important for delivering long-term growth benefits in the ECOWAS countries. Several aspects of improving the quality of institutions can take the form of enhancing investors' confidence and the rule of law, reducing the level of uncertainty as well as ensuring a well- functioning financial system, among others. Third, the interactive terms of remittances and financial sector development offers policy clues to financial sector regulators on the need to further broaden the roles of institutions inside the remitting process to mobilise more savings from remitted funds and channel the same savings into the hands of talented but financially constrained households and private investors who are ready to engage in productive and growth-enhancing activities in the economy. Fourth, the interactive terms of remittances and institutional quality suggest the need for policymakers to set policies that strengthen governance institutions in terms of enforcing regulations, which can significantly minimise the high level of corruption and political instability. It is equally important for countries in the ECOWAS sub-region to pursue policies such as the creation of awareness of property rights and the removal of bureaucratic bottlenecks, which are

important in strengthening the political-economic environment, thus increasing the developmental benefits of remittances.

This study contributes to the existing literature in the following ways: First, using the 2SLS/IV estimator, which accounts for the potential endogeneity problem associated with remittances, we identified the negative effect of the economic and financial crisis of 2007 to 2009 on the relationship between remittances and economic growth. Second, it sheds more light on the influence of financial sector development and institutional quality in the relationship between remittances and economic growth in the ECOWAS sub-region by adopting alternative measures of remittances, financial sector development, and institutions to check the robustness of the findings. To the extent that remittances affect economic growth, we suggest that future studies can consider the role of the size of institutions in the informal economy in influencing the effect of remittances on the economic growth of the ECOWAS sub-region or any other sub-regional bloc from the African continent, considering that a sheer volume of remittances flows through the informal system, mainly through the activities of the unlicensed money transfer (Hawala) operators. The present study assumes a homogenous group, and given the income classification shown in Appendix 1, a country-by-country estimation is suggested to see if there are differences between the countries. Furthermore, future studies can investigate the robustness of the findings in this study by considering a broader set of composite political risk index, which comprises 12 measures for the various dimensions of the political and business environment which are available from the Political Risk Services (PRS) group.

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Authors' contributions

Temitayo O. Olaniyan designed the study, collected and analysed the data, and drafted the manuscript. Muftau A. Ijaiya designed, read, and supervised the manuscript. Funso T. Kolapo read the manuscript and final draft. All authors critically revised the manuscript and approved the final version.

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APPENDIX

List of countries in the sample

Country	World Bank Code	Income
Benin	BEN	Low income
Burkina Faso	BFA	Low income
Cabo Verde	CPV	Lower middle income
Côte d'Ivoire	CIV	Lower middle income
The Gambia	GMB	Low income
Ghana	GHA	Lower middle income
Guinea	GIN	Low income
Guinea Bissau	GNB	Low income
Liberia	LBR	Low income
Mali	MLI	Low income
Niger	NER	Low income
Nigeria	NGA	Lower middle income
Senegal	SEN	Lower middle income
Sierra Leone	SLE	Low income
Togo	TGO	Low income

Source: The World Bank WDI Database

	GDPG	REM	RPC	DCFS	DCPS	POL	ECON	INST	AGG	CRISIS	OPEN	GEXP	INFR
GDPG	1												
REM	-0.0534	1											
RPC	0.0224	0.6257	1										
DCFS	0.0498	0.3301	0.5770	1									
DCPS	0.0344	0.3585	0.7583	0.5935	1								
POL	0.1681	0.0818	0.1256	0.0261	0.1540	1							
ECON	0.0295	0.0305	0.0133	-0.0939	0.0309	0.2544	1						
INST	0.0363	0.0232	0.0089	-0.0673	-0.0287	0.2733	0.3822	1					
AGG	0.1278	0.0623	0.0849	-0.0494	0.1007	0.3180	0.5731	0.5445	1				
CRISIS	0.0272	-0.0473	0.0105	-0.0178	0.0047	-0.0167	-0.1128	-0.0664	-0.0662	1			
OPEN	0.0470	0.2484	0.1235	0.6699	0.1331	0.0693	-0.0281	0.0351	0.0168	0.0167	1		
GEXP	0.0106	0.1687	0.1968	0.1381	0.3179	0.0722	0.0214	-0.0025	0.0313	-0.0235	0.0240	1	
INFR	-0.0086	-0.1723	-0.1165	-0.0411	-0.2470	-0.0587	-0.0833	-0.0480	-0.0945	-0.0359	-0.0215	-0.2290	1

Source: Authors' computation with underlying data from the WGI and WDI databases. **Note:** GDPG = real GDP per capita growth rate; REM = remittance inflows as a percentage of GDP; RPC = remittances per capita; DCFS = domestic credit by the financial sector; DCPS = domestic credit to the private sector; POL = index of political risk; ECON = index of economic risk; INST = index of institutional risk; AGG = aggregate index of the institutional variables; CRISIS = dummy variable for the economic and financial crisis, 2007 to 2009; OPEN = trade openness; GEXP = government final consumption expenditure; INFR = GDP deflator.