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Mediating roles of institutions in the remittance-growth relationship: evidence from Nigeria**Ibrahim A. Adekunle, Tolulope O. Williams, Olatunde J. Omokanmi & Serifat O. Onayemi**

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Abstract

In this study, we examine the mediating roles of institutions in the remittances growth relationship for some reasons. We found that no country-specific study has towed this line leaving a vacuum in the literature of development and international finance. Most studies along this dimension have been done as a continental panel study with significant attendant deficiencies. Heterogeneous nature of institutional arrangements in African nations makes findings on the moderation roles of institutions in the remittance-growth relationship regional specific. We rely on the autoregressive distributed lag (ARDL) estimation procedure to establish a clear line of thought on the interactions of the variables of interest. Short-run results revealed that remittances inflow positively influence growth, but when institutional factors interact with the remittances variables, only the regulatory quality measures from the product of interactions matters for growth. Nonetheless, long run results revealed that remittances inflow was negatively related with growth, but when interacted with institutional measures and regressed on growth outcomes, we found remittances to positively and statistically influence growth outcomes for all the institutional measures adopted. Therefore, recipient nations should improve on the design and enforcement of laws particularly about their regulatory quality and as well as quality assurance such that they could be positioned to attract increased remittances inflow as well as other sources of external financing needed to augment domestic productivity and growth.

Keywords: Economic Growth, Remittances, Institutions, ARDL, Nigeria.

JEL Codes: E01, E44, F24

1. Introduction

The literature on remittances and growth outcomes have grown tremendously because of the enormous influence of workers remittances inflow to developing nations, but the moderating roles of institutions in the remittances-growth relationship remain ambiguous and need to be studied. Remittances both as source and reflection of growth and development have aided developing nation in diversifying its capital outsourcing strategies(Enderwick, Tung, & Chung, 2011), easing credit constraints by augmenting household capital required for savings and investments(Delgado-Wise, 2016), poverty alleviation (Azam, Haseeb, & Samsudin, 2016; Brown, Connell, & Jimenez-Soto, 2014; Masron & Subramaniam, 2018)through dependency and many other influential means. However,the inducing growth capacity of remittances is not unconnected with the prevailing level of institutional structure and capacity obtainable in a region or country(Saad-Filho & Weeks, 2013). It is no gainsaying that Africa most populous black nation (Nigeria) have limited institutional and technical capacity in their pursuance of growth and development objectives(Ojeka et al., 2019). The inadequacies in technical and institutional capacity are expected to influence with some degree of variation on the interactions between core macroeconomic indices and growth outcomes(Acemoglu &Robinson, 2010). This leads to the essential research question that *“how well does institution moderate the remittances-growth relationship?”*

Previous studies on the remittances-growth relationship in Nigeria reported heterogeneous findings along various dimensions.On the one hand, some strands of studies (seeAjefu & Ogebe, 2019; Eigbiremolen & Nnetu, 2015; Olayungbo & Quadri, 2019; Olubiyi, 2014; Udoh & Egwaikhide, 2010for example) argued that remittances inflow inversely relates to growth. They argued that remittances aid inflation and sometimes hyperinflation, worsen bilateral real exchange rate(Udoh & Egwaikhide, 2010), promotes unproductive labour force when households dependency on migrants remittances soars(Ajefu & Ogebe, 2019), leads to brain drain and inadequate technological know-how as more competent individual migrate in search for greener pastures(Eigbiremolen & Nnetu, 2015). On the other hand, ample studies (seeAfaha, 2012; Ajaero, Nzeadibe, Obisie-Nmehielle, & Ike, 2018; Ajaero & Onokala, 2013; Fonta et al., 2015; Iheke, 2012; Oke, Uadiale, & Okpala, 2011; Oshota & Badejo, 2014; Olowa & Awoyemi, 2009; Olowa, Awoyemi, Shittu, & Olowa, 2013; Olubiyi, 2014; Oshota & Badejo, 2015)argued that remittances inflow induces significant growth and development in Nigeria when they inject scarce financial resources into the economy(Olowa et al., 2013), restrains capital rigidity(Olubiyi, 2014), improve technological

advancement(Fonta et al., 2015), and so on. These variations and conflicting outcomes of the remittances-growth relationship might be due to problems of omitted variable bias. The dominant ability of remittances to lead to substantial growth outcomes in a region or country is premediated on the type, structure and functionality of the institutional arrangement in place in the recipient country. Natalia Catrinescu, Leon-Ledesma, Piracha and Quillin (2009) argued that remittances inflow to regions or country with the weak institutional framework are most likely to produce a nominal effect on growth and development objectives. This is because the government ordinances go a long way to determine the success or otherwise of a policy or capital injection. Thus, type, structure, and functionality of the institutional framework obtainable in a region or country become one of the most significant factors aiding or abating the relationship between remittances and economic growth outcomes in a nation. Democratic dispensation, capital restriction options, capital outsourcing strategies are by far the most significant determinant of a productive remittance-growth relationship in developing nations(Ajide, Raheem, & Adeniyi, 2015). Since government at the most general level makes and enforce the law which includes among others hedging acts and practices, type of capital allowed to be traded and transferred, restrictions on banking and unbanked transactions, migrant policy and many more, it became obvious that institutional quality premediates the remittances-growth relationship and thus becomes apt to examine the quantitative influence of institution as a moderating variable in the remittance growth debate in Nigeria.

In this study, we tested the inference of institution as a moderating variable in the remittances growth relationship in Nigeria with a view of coming up with findings that can redefine policy and research on the subject matter. The novelty of this research is in three-fold; (1) this study leads the debate on the moderating roles of institutions in the remittances-growth relationship in Nigeria. Most country-level studies on remittances inflow have examined its growth-inducing capacity neglecting the moderating roles of the institution in the success or otherwise of this established relationship. Prevailing economic policy and institutional arrangement of a region or country are essential guiding principles as political, socio, and economic variables interact(Le, 2009). Robust institutional arrangements ensure property rights are not violated, migrants investor confidence are not dented(Singh, Haacker, Lee, & Le Goff, 2011), recipient households can go about their socio-economics life in a manner that is devoid of uncertainty and structural ambiguities(Chitambara, 2019). In tandem with the findings of Catrinescu, Leon-Ledesma, Piracha and Quillin (2009), growth in capital

formation, expansive bilateral trade relations and investment objectives are less likely where institutions are weak and ineffective. The large and active flow of remittances to developing nation as an essential and alternative source of investment financing is not unconnected with the type, structure and functionality of institutional arrangement in the recipient country. Thus, the need to gauge the quantitative influence of institutions in the remittances-growth relationship. The intricacies of this unobserved factor (unobserved heterogeneity) underpin this study; (2) At the most general and country-level, Nigeria accounted for the most significant number of migrant and subsequently remittances recipient after Egypt (The World Bank Group, 2016). Since the post SAP era, the country has witnessed tremendous growth in remittances inflow leading to growth but not without economic deficiencies (viewed from rising inflationary tendencies, growing problems of unemployment, uncompetitive real exchange rate, sub-optimal industrialisation strategies etc.). How varying degree of institutional bottlenecks has culminated into the misalignment of remittances inflow for growth and development objectives remains *a priori* unclear in Africa most populous black nation Nigeria. It then becomes expedient to lean experimental proof to the role of institutions in the remittances growth-relationship in Nigeria. (3), no country-specific study has towed this line of argument (moderating roles of institutions in the remittance growth relationship) in Nigeriacreating a vacuum in the literature of remittances on their country level influences. Most studies on the remittances, institution and growth outcomes have been done on cross-country basis in Africa (see Ajide & Raheem, 2016; Ajide *et al.*, 2015; Chitambara, 2019; Zghidi, Sghaier, & Abida, 2018 for an extensive review). It should be noted that structural variations characterised national institutional setup and the outcomes of remittances-growth relationship are expected to differ based on heterogeneous laws and enforcement strategies favoured in each nation. The heterogeneous nature of institutions and society in developing nations particularly Africa warrants the need to examine the moderating roles of institutions in the remittances-growth relationship on a country basis since findings are most likely to be regional or country-specific. A country by country-level analysis of institution, remittances-growth nexus will permit policy implications that are by far most inclined to the development objective of each nation.

Consequent on the above, this study examines the following objectives; (a) does remittances induce growth when institutional variables are accommodated? (b) how significant is the influence of institutions in the remittance-growth relationship in Nigeria? We employed the Auto-Regressive Distributed Lag (ARDL) estimation procedure to account for the dynamic

relationship in the institution, remittance-growth relationship in Nigeria for some reasons. The ARDL estimation procedure allows the dynamic estimation of the short-run and long-run outcomes of the contemporaneous influence of institutions in the remittances-growth relationship. Pesaran, Shin and Smith (2001) argued that the ARDL estimation procedure allows for lagged values to be regressed on the contemporaneous values of the dependent variable without constraints on the specific order of the integration (i.e. $I(0)$ or $I(1)$ variables). It performs optimally under mild assumptions of the short sample size, which is the case with our sample frame of 1996 through 2017. We build upon the work of Ajide et al. (2015) and consider personal remittances as our measure of remittances due to a new development from the World Development Indicator. In the meta-data classification of personal remittances, they are defined without references to the source of income of most households, the underlying motives (altruistic or non-altruistic) and the overriding desire for which it was made. Consistent with new and contemporaneous compilation approaches recently applied by many countries, it is largely categorised as an improvement over the previous measure of remittances inflow. Having introduced the study, the other sections include a brief review of the literature, materials and methods section, results, interpretations and discussion and finally the conclusions and policy recommendations.

2. A Brief Review of the Literature

The literature on remittances and growth outcomes has grown tremendously in cross-country and country-specific studies, but the mediating role of remittances in the remittances growth relationship remains grossly understudied in the extant literature of international finance. In Nigeria, this present study leads the debate on the mediating roles of institutions in the remittances growth relationship. In other climes, few cross-country and continental studies have examined this trend and reported credible findings. Adams and Klobodu (2016) examined the influence of remittances and regime durability on economic growth outcomes in thirty-three (33) Sub-Saharan Africa (SSA). Using the generalised method of the moment estimation procedure, the authors found remittance to influence growth positively and regime type to influence growth inversely. In a related but separate findings, Kadozi (2019), examined the influence of remittances for growth in 45 SSA countries and Rwanda and relied on the cross-sectional analysis to found no statistical influence of remittance on growth. In the findings of Williams (2018), who examined the roles of political institutions in the remittances-growth relationship, remittances to influence growth of country or regions

with strong institutions. The most important findings on the moderating roles of institutions in the remittance growth relation in Africa was conducted by Ajide et al. (2015). The authors, while using the generalised system method of moment, found remittances to substantially reduce growth volatilities when institutional factors are accounted for. In other findings, Ajide, Adeniyi and Raheem (2017) examined remittances, institutions and investment volatilities on a continental basis. Using the generalised system method of moment estimation procedures, the authors found the interactions of remittance with institutional variables to mitigate investment volatilities in 70 selected countries. Afaha (2012) examined the influence of migration and remittance in origin countries with particular reference to Nigeria. The author found remittances to induce growth in Nigeria. Mim and Ali (2012) examined the channels through which remittances inflow induce growth in the Middle East and North Africa countries (MENA). Using the ordinary least square and the system generalised method of moment (SGMM) estimation procedure, the authors found remittances to basically finance consumables and could only instigate growth when its investment properties are well developed.

Other cross-African findings on the remittances, institutions and growth outcomes were conducted by Catrinescu et al. (2009). Using the dynamic panel estimation procedures, the authors found that institutional factors moderate the remittances-growth relationship in the countries examined. In the submission of Ruiz, Shukralla and Vargas-Silva (2009), found a positive nonlinear relationship between remittances and growth in their parametric analysis; and fades when non-linearity of parameters was considered in the non-parametric estimation. In a related finding, Le (2009) examined the influence of trade, remittances and institution on economic growth and found positive growth-inducing capacities for trade, remittances and institutions. Bahattab, Azam, Gavrilă and Emirullah (2016) examined foreign capital flows, institutional factors and economic growth in Yemen. The authors could only establish the positive influence of FDI for growth outcomes in Yemen. Imad (2017) examined the mediating roles of the institution in the remittance-growth relationship in south Mediterranean countries. The author relied on the generalised method of moment estimation procedure to establish the complementarity of remittances and institutions in the pursuance of growth objectives.

Other studies, along with the remittances discourse, and in SSA saw Williams (2017) examined the influence of remittances for political institutions. The author found a positive relationship between remittance and democratic institutions. In other related findings, Afawubo and Noglo (2019), examined the mediating roles of institutions in the

remittances-deforestation relationship in developing countries. The authors found that remittances and institutional factors reduce deforestation. In the industrialisation discourse, Efobi, Asongu, Okafor, Tchamyu and Tanankem (2019) examined remittance, finance and industrialisation in 49 African countries. Using the instrumental variable, fixed effect, generalised method of moment and instrumental quantile regression, the author found remittances to influence industrialisation in Africa. On the remittances-growth volatilities relationship, Bugamelli and Paternò (2011), found remittances to negatively relates to growth in sixty (60) emerging and developing economies. Abdih, Chami, Dagher and Monteil (2012) examined whether remittances is a curse or blessing in the remittances-institutions relationship. The authors examined 111 countries and found higher remittances to GDP ratio to inversely relates to institutional factors. Adams and Klobodu (2018) examined capital flows and growth outcomes in five (5) SSA countries. Using the panel ARDL estimation procedure, capital flows channels heterogeneously influence growth.

3.0 Materials and Methods

Theoretical Framework and Model Specification

To gauge the moderating influence of institutions in the remittances-growth relationship, we rely on the neoclassical theory of the international flow of capital in tandem with Ojapinwa and Odekunle (2013). The classical and neoclassical theories argued that significant and sufficient capital be transferred from developed region to developing regions where higher needs are present, and incentives to optimise return for investors are also satisfied (Rose, 1998). This theoretical exposition is said to premeditate growth and subsequent development. In more general terms, the extended neoclassical growth theory argues that growth of capital stock, improved technological know-how and increased output per unit of effective labour are the essential growth inducing factors (Solow, 1994). However, the open economies analytical framework of growth outcomes assumes capital injections but mainly through established financial institutions (Romer, 1993). Since institutions are responsible for the laws that guide the operations of the financial institution, the overriding influence of remittances on the perceived growth outcomes are the direct result of remittances inflow or outflows permitted by varying degrees of the institutional framework in place (Catrinescu et al., 2009). In the analysis of the open economies theory, capital flows to developing nations induce steady growth rate when resources are allocated efficiently by strong institutions. The adverse

consequence of the open economies theory is incorporated in the capital flight likely consequences which induces the savings gaps (Cobb-Clark, Kassenboehmer, & Sinning, 2016) when domestic savings are inadequate, and trade gap (Petersen & Rajan, 1997) when financial intermediation fails. The role of institutions is well pronounced in the efficacy analysis of foreign inflow (remittances inflows) and the overriding consequences for growth.

We adopt the Solow-Swan growth framework based on the premise that output in an economy is produced using a combination of labour (L) and capital (K) under constant returns, where the quantity of output (y) is determined by the efficiency (A) been a useful starting point. The solow-swan model is expressed as;

$$Y_t = Af(L, K) \quad (1)$$

In a highly competitive and politically motivated society, growth outcomes can be summarised to be a weighted sum of the growth rates of the efficiency parameter, g_A , of the labour force, g_L , and of the capital stock, g_K , where the weights on the latter two are the shares of remittances inflow to labour augmentation and capital diversification in the growth model.

$$Y_t = g_A + a_L g_L + a_K g_K \quad (2)$$

By introducing the moderating variables of institutions using the Cobb-Douglas production function framework, we could extend the representation in Equ (2) to be;

$$Y_t = AL_t^{1-\alpha} K_t^\alpha REM_t * INST_t \quad (3)$$

Y_t represent the output growth; L_t measures output per unit of effective labour; K_t represents output per unit of effective capital and REM_t is personal remittances inflow (an improved measure of remittances inflow) and $INST_t$ gives the institutional factors moderating the remittances-growth relationship. The remittance, institutions and growth model is expressed as:

$$RGDP_t = A + \sum_t^{n=1} \gamma_n REM_t + \sum_t^{n=1} \pi_n RULE_{LAW}_t + \sum_t^{n=1} \omega_n REG_{QUALITY}_t + \sum_t^{n=1} \theta_n CONT_{CORRP}_t + \mu_t \quad (4)$$

Where γ , π , ω , and θ are the elasticities remittances inflow, the rule of law, regulatory quality, and control of corruption. A is the efficiency of the institution moderating remittances-growth relationship. $RGDP$ is real GDP (a measure of economic growth), $RULE_{LAW}$ (the rule of law) measured as the relative perceptions of the depth to which rules and order are enforced and tracked, $REG_{QUALITY}$ measures regulatory quality and it represents the perceptions regarding the ability of government and its associative organs to formulate and implements policies that are private sector inclusive, $CONT_{CORRP}$ measure the control of corruption. It represents the perceptions of the magnitude of using public office for personal gains, either in small or large capacities. It goes on to include consequences of godfatherism and political hijacking that disrupt baseline sovereignty of independent nations for private gains.

To adjust for variance in unit and measurement (heteroskedastic) and to produce a consistent and robust estimate in the institution moderating remittances-growth relationship, we take the semi-logarithms and time derivatives of equation (4) to generate the following dynamic function:

$$\begin{aligned} \ln RGDP_t = A + \sum_t^{n=1} \gamma_n \ln REM_t + \sum_t^{n=1} \pi_n \ln RULE_{LAW}_t + \sum_t^{n=1} \omega_n \ln REG_{QUALITY}_t \\ + \sum_t^{n=1} \theta_n \ln CONT_{CORRP}_t + \mu_t \end{aligned} \quad (5)$$

Data

This paper is a country-specific study that gauges the mediating roles of institutions in the remittances-growth relationship from 1986 through 2017. The choice of Nigeria was informed by the desire to explain the country-specific influence of institutional arrangements in the remittance-growth relationship. Institutional settings in African nations are heterogeneous and as such finding on the moderating effect of remittances-growth relations is expected to differ. Data availability was also an important consideration when choosing the scope and dimension of the study. The indices of institutions are classified into six major variables obtainable from the World Governance Indicator (WGI). The WGI indices on institutional quality were first reported in 1996. These aggregates were not generalisable in the cross-border examination because of varying level of law and enforcement strategies, so

we restricted our domain to the Nigerian context. We measured growth outcomes in Nigeria using data on real GDP as in Catrinescu et al. (2009); remittance was measured with data on personal remittances as in Ajide et al. (2015); we considered the rule of law, regulatory quality, control of corruption as measures of institutional quality premediating the remittances-growth relationship. This measure is in consonance with measures used in the work of Lijphart (2011); Nifo and Vecchione (2015). The data are mainly obtained from the Central Bank of Nigeria (CBN); World Development Indicators (WDI) of various issues up until 2017 and the World Governance Indicator (WGI, 2017). The variables used in this study are described in Table 1.

Table 1: Variable Description

Abbreviation	Description	Measured As	Source
$RGDP_t$	Growth Outcomes	Real Gross Domestic Product (RGDP)	Central Bank of Nigeria (CBN)
REM_t	Remittances	Personal Remittances	World Bank Database (WDI)
$RULE_{LAW_t}$	Rule of Law	Rule of Law	World Governance Indicator (WGI)
$REG_{QUALITY_t}$	Regulatory Quality	Regulatory Quality	World Governance Indicator (WGI)
$CONT_{CORRP_t}$	Control of Corruption	Control of Corruption	World Governance Indicator (WGI)

*WDI: World Development Indicator; WGI: World Governance Indicator; CBN: Central Bank of Nigeria

Research Design

We adopted an *ex-post-facto* analytical technique to gauge the moderating roles of institutions in the remittance-growth relationship in Nigeria. We reported the descriptive statistics to establish the normality conditions of the variables in our data set as in Gujarati and Porter (2009). We estimated the correlations coefficients to ensure the covariance assumptions of the conventional classical linear regression models are not violated, leading to problems of multicollinearity of regressors. Thus, providing unreliable and spurious elasticities. We proceed to estimate the stationarity of the data set and inform the choice of the estimation procedure. We tested the Augmented Dickey-Fuller (ADF), Philip Perron Test and the KPSS Test confirmatory test to ascertain the stationarity of the variables. In tandem with the frontline literature on unit-root testing, the time series unit root test is based on estimating equation(6):

$$\Delta Y_t = \alpha_i + \eta y_{t-1} + \delta_t + \sum_{k=1}^{k_i} \theta_i^{(k)} \Delta y_{t-k} + \varepsilon_t$$

$$\varepsilon_t \sim idN(0, \theta_\varepsilon^2) = 1, 2, \dots, N, t = 1, 2, \dots, T \quad (6)$$

Where y_t denotes the y variable observed for the N entities in the T periods, and Δ is the difference operator. The unit root test involves the null hypothesis $H_0 : \rho_i = 0 \forall i$ against the alternative $H_A : \rho_i = \rho < 0 \forall i$.

For robustness and heteroskedasticity consistency, we estimated the Kwiatkowski, Phillips, Schmidt, and Shin (1992) (KPSS) test reconfirmation test for stationarity due to its richness in time series data stationarity confirmation. The KPSS unit root test reports a null hypothesis of no unit root in any of the series estimated. Given the residuals obtainable from the individual ordinary least square (OLS) regressions of a constant, or on a constant and a trend, the KPSS unit root test requires only the specification of the form of the OLS regressions: whether to include only individual-specific constant terms, or whether to include both constant and trend terms. In particular, the KPSS appears to over-reject the null of stationarity and may yield results that directly contradict those obtained using alternative test statistics (see Hasan and Koenker (1997); Said and Dickey (1984) for discussion and details). We proceed to estimate the ARDL to establish a clear line of thought on the moderating effect of institutions in the remittance-growth relationship in Nigeria. We employed the Auto-Regressive Distributed Lag (ARDL) estimation procedure to account for the dynamic relationship in the institution, remittance-growth relationship in Nigeria for some reasons. The ARDL estimation procedure allows the dynamic estimation of the short-run and long-run outcomes of the contemporaneous influence of institutions in the remittances-growth relationship. Pesaran, Shin and Smith (2001) argued that the ARDL estimation procedure allows for lagged values to be regressed on the contemporaneous values of the dependent variable without constraints on the specific order of the integration (i.e. I(0) or I(1) variables). It performs optimally under mild assumptions of the small sample size, which is the case with our sample frame of 1996 through 2017. To establish the robustness and validity of our ARDL institutional moderating remittance-growth relationship, we tested for serial correlation using the Breusch-Godfrey Serial Correlation test and the Breusch Pagan Heteroscedasticity test to establish homoscedastic assumptions. CUSUM stability test was employed to verify the structural stability of the model.

4.0 Result and Interpretations

Table 2 shows the mean and median of all the observations in the data set lie within the maximum and minimum values indicating the high tendency of normal distribution. All the variables are positively skewed. The kurtosis statistics show that all the variables were platykurtic, suggesting that their distributions were flat relative to normal. The Jarque-Bera statistics shows that the series is normally distributed since the p-values of all the series are not statistically significant at 5% level. Thus, informing the acceptance of the null hypothesis that says each variable is normally distributed.

Table 2: Descriptive Statistics of the Data Set

	<i>RGDP</i>	<i>REM</i>	<i>RULE_{LAW}</i>	<i>REG_{QUA}</i>	<i>CONT_{CORRP}</i>
Mean	2.562	3.332	2.663	3.882	2.663
Median	3.562	4.612	3.772	4.662	3.331
Maximum	5.735	5.773	5.674	7.772	6.777
Minimum	1.459	2.286	1.226	2.556	1.563
Std. Dev.	2.655	1.313	1.575	2.285	2.568
Skewness	0.299	1.333	0.667	0.473	0.737
Kurtosis	1.323	1.564	1.646	2.664	2.099
Jarque-Bera	3.456	3.828	1.663	2.182	1.267
Probability	0.133	0.083	0.072	0.383	0.737

Note: Descriptive statistics were taken before the variables were transformed into logarithm forms. The Jarque-Bera test whether a given series follow a normal distribution or not. It tests the null hypothesis that a given series is normally distributed.

Source: Author, 2020

Test of Multicollinearity

We gauge the level of collinearity among regressors and found no correlation exists between the variables making results emanating from the study mostly reliable. We reported no endogeneity of regressors and the independent ability of each of the explanatory variables to single handily predict variations in the remittances growth relationship is not violated.

Table 3: Correlation Matrix of the Data Set

	<i>RGDP</i>	<i>RULE_{LAW}</i>	<i>REG_{QUA}</i>	<i>CONT_{COR}</i>	<i>REM</i>
RGDP	1				
RULE_{LAW}	0.543	1			
REG_{QUA}	0.421	-0.621	1		
CONT_{COR}	0.549	-0.442	-0.721	1	
REM	0.452	0.597	0.399	-0.798	1

Source: Author, 2020

The study presents the results of the correlation analysis of the set of variables employed in Table 3. Since the correlation between the variables is less than 0.95, hence, there is no tendency for multicollinearity among such variables (Baltagi, Bun, & Sarafidis (2015). Explicitly, the rule of law is positively correlated with real GDP (0.543); regulatory quality is positively correlated with real GDP (0.421) and negatively correlated with the rule of law (-0.621). Control of corruption is positively related to real GDP (0.549) and negatively related to the rule of law (-0.442) and regulatory quality (-0.721). Finally, remittances are positively related to real GDP (0.452), the rule of law (0.597), regulatory quality (0.399) but negatively related to control of corruption (-0.798).

Stationarity Analysis

In Table, 4, we report the result of the ADF, PP, and the KPSS confirmatory tests. All tests confirmed that variables are non-stationary at levels but are stationary at first difference except the rule of law, which was stationary at level. These empirical outcomes did uncover not only the non-stationary properties of all the variables but also established the covariance nature of the data set under investigation. We proceed to estimate the ARDL to establish the baseline relationship between the variables of interest. This is indispensable in this research because the choice of the estimation strategy is consistent with the data behaviour and in consonance with contemporary ARDL-centric literature (see Kisswani, 2017; Mathur & Shekhawat, 2018; Pal & Mitra, 2016; Sharma & Kautish, 2019 for some examples).

Table 4: Unit Root Tests

Variables	@LEVEL			@FIRST DIFFERENCE			ORDER OF INTEGRATION
	ADF	PP	KPSS	ADF	PP	KPSS	
	Intercept {Trend & Intercept}						
<i>RGDP</i>	0.522 {0.662}	0.672 {0.989}	0.633 {0.872}	0.766* {0.231}**	0.539* {0.791}*	0.622* {0.899}*	I(1)
<i>RULE_{LAW}</i>	-1.681** {0.874}*	-1.569** {0.882}*	-1.539** {0.494}*	-	-	-	I(0)
<i>REG_{QUALITY}</i>	-1.521 {0.743}	-1.573 {0.765}	-1.595 {0.711}	-1.764* {0.812}*	-1.622* {0.666}*	-1.721* {0.793}*	I(1)
<i>CONT_{CORRP}</i>	0.228 {0.624}	0.623 {0.583}	0.623 {3.252}	0.627* {0.727}*	0.838* {0.638}*	0.838* {0.783}*	I(1)
<i>REM</i>	-1.871 {0.728}	-1.839 {0.023}	-1.728 {0.567}	-1.288* {0.772}*	-1.838* {0.893}*	-1.788* {0.939}*	I(1)

Source: Author, 2020

T-Stat values of intercept estimates are reported in the text box while T-Stat values of trend & intercept estimates are in the parentheses; * $P < 0.01$, ** $P < 0.05$ respectively

The primary form of the ARDL model is given as:

$$\begin{aligned} \Delta \ln RGDP_t = A + \sum_t^{n=1} \sigma_n \Delta \ln RGDP_{t-n} + \sum_t^{n=1} \gamma_n \Delta \ln REM_t + \sum_t^{n=1} \pi_n \Delta \ln RULE_{LAW_t} \\ + \sum_t^{n=1} \omega_n \Delta \ln REG_{QUALITY_t} + \sum_t^{n=1} \theta_n \Delta \ln CONT_{CORRP_t} + CointEq_{-1} + \mu_t \end{aligned} \quad (7)$$

All other variables remain as earlier defined, Δ is the first difference operator, $RGDP_{t-n}$ gives the lagged value of the regressand and $Coint_{-1}$ represent the error correction component of the ARDL model.

Lag Length Selection

The issue of finding the appropriate lag length for each of the underlying variables in the ARDL model is fundamental because we seek Gaussian error terms. For optimal lag length selection, we rely on the Schwartz information criteria (SIC) to obtain the lag length value that minimises the Information Criterion and at which the model does not have autocorrelation is the optimal lag length.

Table 5: Lag Length Selection

Lag Length	SC
1	1.977*
2	3.552
3	3.998

Source: Author, 2020

NOTE:* $P < 0.01$, ** $P < 0.05$ respectively

Based on the result in table 5, the lag length, which minimises SIC, is lag one and thus our optimal lag length. Given our optimal lag length, we proceed to test for the long-run relationship between the variables.

The Bound Test

We estimated the bound testing procedure to establish the long-run relationship among the variables. The bound testing procedure is based on the F-test as prescribed in Pesaran et al., (2001). The F-test is based on the assumption of no co-integration among the variables against the premise of its existence, denoted as:

$H_0: \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = \beta_6 = \beta_7 = 0$, i.e., there is no co-integration among the variables.

$H_1: \beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq \beta_5 \neq \beta_6 \neq \beta_7 \neq 0$, i.e., there is co-integration among the variables.

Table 6: Bound Test Result

F-Statistics	1%		5%		10%	
	Lower bound	Upper bound	Lower bound	Upper bound	Lower bound	Upper bound
2.445	3.41	4.68	2.62	3.79	2.26	3.35

Source: Author, 2020

NOTE: * $P < 0.01$, ** $P < 0.05$ respectively

Given the result of the Bound Test in Table 6, the F-statistic value should be compared with the Pesaran critical value at traditional levels of significance. It is noted by Narayan (2005), the current critical values reported in Pesaran *et al.* (2001) cannot be used for small sample sizes because they are predicated on the premise of the existence of large sample sizes. Narayan (2005) provided a set of critical values for sample sizes ranging from 30 to 80 observations. They are 2.496 – 3.346 at a 10% level of significance, 2.962 – 3.910 at a 5% level of significance, and 4.068 – 5.250 at a 1% level of significance. Since the F-statistic 2.445, is lower than the lower bound critical value, we thus reject the null hypothesis and conclude that all the variables in the model have co-movements in the long-run in Nigeria. From the result, we can hence estimate the long-run mediating role of institutions in the remittances-growth relationship.

ARDL Long-run relationship

The estimated result presented in Table 7 explained the long-run intermediating roles of institutions in the remittances-growth relationship in Nigeria. The result revealed that the one-period lag values of real GDP are positive and statistically significant at 5%. Hence, it implies that a percentage increase in the one-period lag value of real GDP will exert 0.729 percentage increase in real GDP in the long-run. This shows that growth outcomes in Nigeria follow an inflating pattern similar to what was observed in the work of Afonso and Claeys (2008). In other related but different findings, remittances inflow was negative and statistically significant at 5%, implying that a percentage increase in remittances inflow will induce 0.704 percentage decrease in growth in Nigeria. The inverse remittances-growth relationship observed may be due to the deleterious influence of remittances on growth as reported in the work of Udoh and Egwaikhide (2010) who argued that remittances aid inflation and sometimes hyperinflation, worsen bilateral real exchange rate. In other climes, Ajefu and Ogebe (2019) reported that remittances promote unproductive labour force when households dependency on migrants remittances soars while Eigbiremolen and Nnetu

(2015) believes that remittances lead to brain drain and inadequate technological know-how as more competent individual migrate in search for greener pastures.

When we interacted the institutional variables with remittances and regressed on growth outcomes, we found remittances to positively and statistically influence growth outcomes for all the institutional measures adopted. The rule of law, regulatory quality and control of corruption were all positive and statistically significant at 1%, 5% and 5% respectively. This implies that a percentage increase in remittances inflow when institutional factors are accommodated with lead to 0.261, 0.041 and 0.022 percentage increase in growth outcomes in Nigeria in the long run. By intuition, remittances as a predictor of growth outcomes in Nigeria is conditioned on the predominant institutional arrangements. These findings are, by far the most significant contribution of this paper to the moderating roles of institutions in the remittances-growth relationship in Nigeria. In stark contrast with the findings of Chami, Hakura and Montiel (2012), we argued that the remittance-growth relationship is best examined under the conditions of the predominant institutional arrangements obtainable in a region or country. This is in tandem with the findings of Ajide et al. (2015); Catrinescu et al. (2009); Zghidi et al. (2018).

Table 7: Long-Run Results

Dependent variable: $\delta RGDP_t$			
Variable	Coefficient	t-Statistic	Prob.
C	-4.961	-0.327	0.75
$\delta \ln \Delta RGDP_{t-1}$	0.729	1.827	0.015**
$\delta \ln \Delta REM_t$	-0.704	-0.417	0.04**
$\delta \ln \Delta RULE_{Law_t} \times REM_t$	0.261	0.335	0.00*
$\delta \ln \Delta REG_{QUALITY_t} \times REM_t$	0.041	0.237	0.02**
$\delta \ln \Delta CONT_{CORRP_t} \times REM_t$	0.022	0.042**	0.03**

NOTE:* $P < 0.01$, ** $P < 0.05$ respectively

Source: Author, 2020

ARDL Short-run Results

In the short-run analysis of the mediating roles of institutions in the remittances-growth relationship, The Adjusted R-Square shows that the explanatory variables of the model explain 65.3% variation in the dependent variable in the short-run, and about 34.7 remains exogenous. The value of the F-statistic (79.772) was statistically significant at 1% level, indicating that the model was significant. The value of the Durbin-Watson statistic (1.865) shows that the model had no serial correlation problem because it was within the acceptance

range of 1.5-2.5 (see Dufour & Dagenais, 1985; Durbin, 1960 for references). The coefficient of the co-integrating term $CointEq(-1)$, which gives the error correction term was also found to be negative and significant at 1%. The error correction term, which denotes the speed of adjustment towards long-run equilibrium is 42.1 per cent. This explains that the whole system can achieve short-run equilibrium at a speed of 42.1%. The results indicate that in the short-run, one-period lagged value of real GDP is positive and statistically significant at 1%. Hence, it implies that a percentage increase in the one-period lag value of real GDP will exert 0.563 percentage increase in real GDP in the long-run. In tandem with the long-run estimates, growth outcomes in Nigeria follow as an inflaming pattern in consonance with the findings of Afonso and Claeys (2008). In other climes, remittances inflow induce positive growth in the short run since the coefficients exert 0.768 percentage increase in economic growth at a 5% level of significance. However, when institutional variables interacted with remittances inflow, short-run estimates point to institutional relevance of only the regulatory quality measures. A percentage increase in remittances inflow when institutional factors are accommodated with lead to 0.563 increase in growth outcomes in Nigeria in the short-run. Other institutional measures, when interacted with remittances, does not statistically predict growth at any conventional level of significance. Short-run variances could be due to time alteration and the length it takes for the manifestation of institutional settings to come to bear on the remittance-growth inducing capacities.

Table 8: Short-Run Result

Dependent variable: $\delta RGDP_t$			
Variable	Coefficient	t-Statistic	Prob.
C	0.662	0.627	0.001
$\delta \ln \Delta RGDP_{t-1}$	0.563	1.772	0.003*
$\delta \ln \Delta REM_t$	0.768	0.882	0.048**
$\delta \ln \Delta RULE_{Law_t} \times REM_t$	0.028	2.261	0.151
$\delta \ln \Delta REG_{QUALITY_t} \times REM_t$	0.563	2.351	0.031**
$\delta \ln \Delta CONT_{CORRP_t} \times REM_t$	-0.035	-1.583	0.114
$CointEq(-1)$	-0.762	-0.176	0.002*
R-squared	0.421	-	-
Adjusted R-squared	0.653	-	-
F-statistic (Prob)	79.772 (0.003*)	Durbin-Watson Stat	1.865

NOTE: * $P < 0.01$, ** $P < 0.05$ respectively

Source: Author, 2020

Table 9: Serial Correlation Test

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	0.662	Prob. F(4,21)	0.443
Obs*R-squared	2.552	Prob. Chi-Square(4)	0.134

Source: Author, 2020

Given the probability value of 13.4%, we fail to reject the null hypothesis and conclude that our model is free from serial correlation

Table 10: Heteroscedasticity Test

Source: Author, 2020

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	1.772	Prob. F(4,21)	0.029
Obs*R-squared	2.522	Prob. Chi-Square(4)	0.163

The p-value (0.163) of Obs* R-squared showed that we could not reject the null hypothesis. This implies that residuals have a constant variance which is desirable. That is, residuals are homoskedastic.

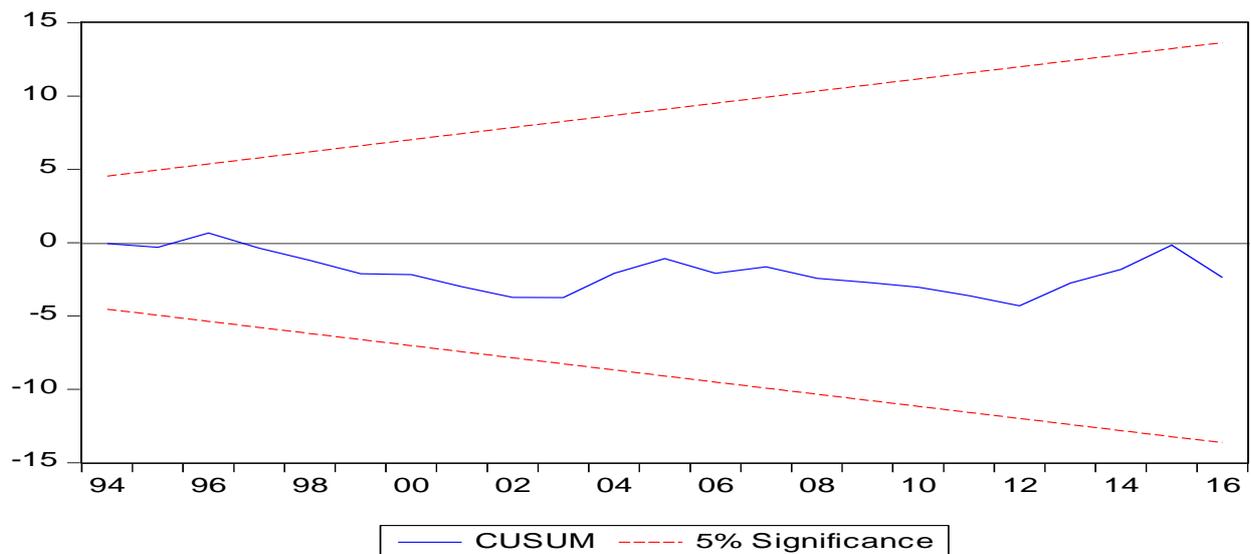


Fig. 1: CUSUM Stability Test

Source: Author, 2020

The above figure shows that the CUSUM line is within the critical bounds of 5 percent level of significance, which indicates that the model has structural stability.

5.0 Conclusion

The variations and conflicting outcomes of the remittances-growth relationship in Nigeria might be due to problems of omitted variable bias. One central variable that has primarily been omitted in this relations is the institutional quality variables. The dominant ability of remittances to lead to substantial growth outcomes in a region or country is premediated on the type, structure and functionality of the institutional arrangement in place in the recipient country. Democratic dispensation, capital restriction options, capital outsourcing strategies are by far the most significant determinant of a productive remittance-growth relationship in developing nations (Ajide, Raheem, & Adeniyi, 2015). Since government at the most general level makes and enforce the law which includes among others includes hedging acts and practices, type of capital allowed to be traded and transferred, restrictions on banking and unbanked transactions, migrant policy and many more, it became obvious that institutional quality premediates the remittances-growth relationship and thus becomes apt to examine the quantitative influence of institution as a moderating variable in the remittance growth debate in Nigeria. We employed the ARDL estimation procedure to account for the long run and short-run estimates of our institution moderating remittances-growth relationship. Short-run results revealed that remittances inflow positively influence growth, but when institutional factors have interacted with the remittances variables, only the regulatory quality measures from the product of interactions matters for growth. Other institutional measures, when interacted with remittances, does not statistically predict growth at any conventional level of significance. Short-run variances could be due to time alteration and the length it takes for the manifestation of institutional settings to come to bear on the remittance-growth inducing capacities.

Nonetheless, long run results revealed that remittances inflow was negatively related with growth, but when interacted with institutional measures and regressed on growth outcomes, we found remittances to positively and statistically influence growth outcomes for all the institutional measures adopted. By intuition, remittances as a predictor of growth outcomes in Nigeria is conditioned on the predominant institutional arrangements. These findings are, by far the most significant contribution of this paper to the moderating roles of institutions in the remittances-growth relationship in Nigeria. In stark contrast with the findings of Chami, Hakura and Montiel (2012), we argued that the remittance-growth relationship is best examined under the conditions of the predominant institutional arrangements obtainable in a region or country. This is in tandem with the findings of Ajide et al. (2015); Catrinescu et al. (2009); Zghidi et al. (2018). From policy perspectives, recipient nation should improve on the

design and enforcement of laws particularly about their regulatory quality and well as quality assurance such that they could be positioned to attract increased remittances inflow as well as other sources of external financing needed to augment domestic productivity and growth. Without appropriating the institutional arrangements, the growth-inducing capacity of remittances inflow will be impeded. On the need for further research, few empirical studies have been done on the mediating roles of institutions on the remittances growth relationship both as country-specific studies and a continental analysis. A non-linear analysis and a panel transition regression analysis could be revealed in the examination of the moderating role of institutions in the remittances-growth relationship.

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