Remittance inflows and economic development in Rwanda

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CHAPTER FIVE

5.0 Cross-Country Analysis: Remittances and Economic Growth in SSA Countries

In the economic growth literature, scholars are preoccupied by the rate at which countries bridge the gap between the current status of their economies and the desired long-term growth path. Remittances comes into play as an inflow that affects various channels relevant to successful economic growth and development, such as investment in physical and human capital, external capital inflows represented by official development assistance, FDI, and openness. This economic growth approach is driven by the theoretical framework of the endogenous growth model and the national account model, which claim that remittances affect growth and development. These two models inform the empirical strategies employed in this thesis. This study uses cross-country data for 45 Sub-Saharan countries and Rwandan data in particular.

This chapter examines the impact of remittance inflows on economic growth in SSA countries and Rwanda in particular for the period between 1980 and 2014. It further examines whether this growth effect is conditioned by institutional and development factors in SSA countries. This chapter answers the first two specific research questions of this study: What is the effect of remittance inflows on economic growth in SSA countries and Rwanda in particular for the period from 1980 to 2014 and what factors condition the intensity of these effects in SSA countries and Rwanda?

Random effect estimation techniques are employed to examine the remittance-growth effect in the SSA region and the conditional role of institutional and development factors in conditioning the remittance-growth effect. The study contextualizes the remittance-growth effect analysis to Rwanda. To do so, the cointegration test, the ECM and Johansen test of co-integration estimation techniques are employed to examine the remittance-growth effect and the direction of long-run causality between remittances and economic growth in Rwanda. A panel data of 45 SSA countries and random effect estimation techniques are employed to examine the remittance-growth effect in the SSA region and the conditional role of institutional and development factors in mediating the remittance-growth effect. To contextualize the remittance-growth effect analysis to Rwanda, I employ the same tests.

The empirical findings related to the remittance-growth effect in SSA countries support the national account model and the endogenous growth theories. Accordingly, the cross-sectional analysis of the SSA region finds no significant impact of remittances on economic growth in the SSA region. This evidence seems to suggest that the effect of remittances on

economic growth varies within SSA countries, implying that the effect plays out differently within the region, but remains moderate across the region. According to Rodrik (2016) and Acemoglu et al. (2014), this variation is normal and can be attributed to differences in policy and institutional quality within and across countries. Similarly, findings of this study indicate that the remittance-growth impact is positively influenced by the country's level of development, financial development and education. This implies that remittances affect economic growth by positively and significantly contributing to the financial sector development and human capital development in the recipient economy. This effect is in line with the theoretical claims of the endogenous growth theory. The growth effect is however undermined by the low quality of institutional variables in the region, such as political instabilities and strict regulations. The findings also suggest that institutional and development factors play out differently within SSA countries, implying that the remittance-growth effect is country-specific within the SSA region. This motivates the choice to look at the remittance-growth effect at the country level, in this case, Rwanda.

The remittance-growth effect in Rwanda holds. The findings reveal a positive and significant remittance-growth impact in Rwanda. The marginal effect of remittances to GDP per capita increases as more remittance flow to Rwanda. The results of interaction term of the Rwanda dummy and remittances yield a positive and significant effect of remittances on GDP per capita in Rwanda over the period of study. This is confirmed by the results of the Johansen test of cointegration and the ECM estimation techniques, which reveal plausible evidence of a long-run relationship between remittances and GDP per capita. The long-run causality runs from remittances to GDP per capita in Rwanda but not vice versa. These findings suggest that the positive and significant effect of remittances on the economic growth in Rwanda can be attributed to the recent overall improvement in the policy and institutional framework that has conditioned the productive use of these inflows, which has resulted in the remittance-growth effect.

5.1 Data and Descriptive Analysis

This study relies on the relationship between personal remittances and real GDP per capita (as a proxy for economic growth) and introduce relevant control variables. The study opts for a definition of personal remittances (see Section 2.2.1) and data are in U.S. dollars. The selection of control variables was guided by the existing literature but also by the need to include as many SSA countries as possible in the sample to increase the explanatory power by increasing the number of observations, while considering the availability of data from

these countries as a limiting factor. Five main control variables were initially selected: the initial lag of real GDP per capita, the FDI percentage to GDP, gross capital formation percentage to GDP, secondary school enrollments as a percentage of total, and openness and credit to financial sector percentage to GDP (CPS%GDP) as a proxy for financial development. The dummy variable of Rwanda and the interaction term of remittances and quality of institutional variables were added to examine the mechanisms through which the growth effect of remittances is conditioned by institutional and development factors.

Tables 5.1 and 5.2 and Figure 5.7 report the summary statistics, the correlation matrix of variables used in the model, and the scatter plot of percentage of remittances to GDP, respectively, in SSA countries for the year 2012.

Table 5.1: Summary Statistics

	Mean	Std	Min	Max
GDP per capita	6.78	1.18	4.8	9
Rem%GDP	4.49	9.82	0.0	62
GCF%GP	22.32	8.02	5.5	75
FDI%GDD	4.34	8.11	-8.6	85
Openness	17.91	1.88	11.0	22
CPS%GDP	16.41	14.0	0.68	964
Education	42.22	24.98	5.2	122
Political Stab	-0.26	0.81	-2.5	1
Reg Quality	-0.36	0.52	-1.6	1
N	258			

Notes: When I introduce the institutional variables (CPS%GDP, political stability and regulatory quality), the number of observations are reduced from 634 to 258. The number of observations for institutional variables are few from 1996 to 2014.

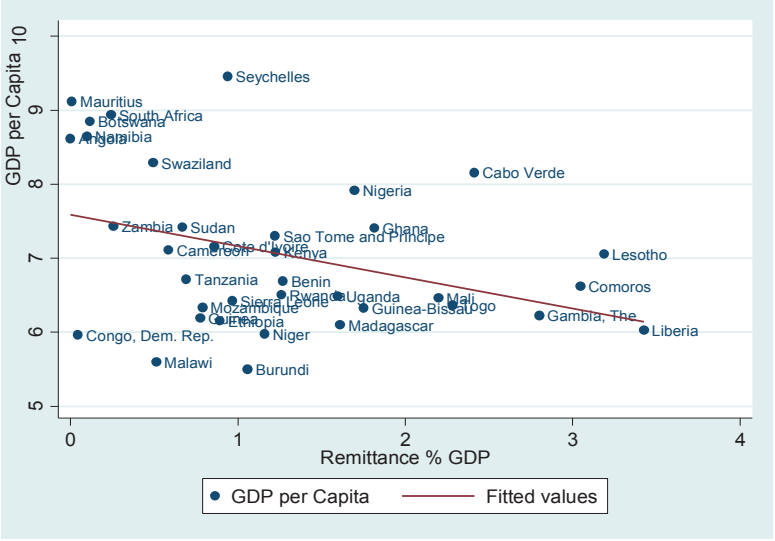
The descriptive analysis from Table 5.2 indicates that the dependent variable (GDP per capita) and the independent variables are strongly correlated and their correlations are statistically significant. This qualifies them to be used in the growth model. Figure 5.7 presents the two-way scatter plot indicating the percentage of remittances to GDP per capita in SSA Countries in 2012. The plot purposely depicts where Rwanda fits on the line of fit in relation to other SSA countries in terms of remittance percentage to GDP per capita.

Table 5.2: Pairwise Correlations between Variables Used in the Growth Equation[10]

	GDP	GCF%GDP	FDI%GDP	OPEN	Rem%GDP	Education	CPS%GDP	Political Stability	Regulatory Quality
GDP	1								
GCF%GDP	0.3447*	1							
FDI%GDP	0.0751*	0.3488*	1						
OPEN	-0.3181*	-0.1552*	0.0349	1					
Rem%GDP	-0.0877*	0.3747*	0.1281*	-0.0612	1				
Education	0.7948*	0.2399*	0.1600*	-0.1681*	-0.0443	1			
CPS%GDP	0.5217*	0.1879*	-0.0153	-0.1584*	-0.0505	0.5435*	1		
Political Stability	0.5210*	0.3634*	0.0634	-0.4017*	0.0076	0.4949*	0.3556*	1	
Regulatory Quality	0.3630*	0.3504*	-0.0564	-0.2330*	-0.1269*	0.5287*	0.5671*	0.5943*	1

Notes: This table reports the correlation matrix of both the dependent and the main control variables. Significance levels are denoted * p < 0.05, ** p < 0.01, *** p < 0.001.

Figure 5.7: Two-Way Scatter Plot Indicating the Percentage of Remittances to GDP in SSA Countries in 2012



Source: *Data from World Bank dataset*

Figure 5.7 indicates the scatter plot of SSA countries. This allows us to compare Rwanda to the other SSA countries. It depicts where Rwanda fits in the line of fit in relation to other SSA countries. Most countries are distributed around the line of fit while others, such as the

[10] Stars signify significance at 1%, 5% and 10%. Variables for real GDP per capita, secondary enrollments as a percentage of total (as a proxy for education), TOT%GDP (trade openness), Rem%GDP, GCF%GDP, and FDI%GDP represent remittance percentage to GDP, gross capital formation to GDP, FDI percentage to GDP, political stability, and regulatory quality, respectively, are not in logarithms. Table 5.2 indicates the degree of comparison and level of significance of correlation for every variable in the correlation matrix. It shows that all independent variables are correlated and significant to the dependent variable (GDP per capita). Table 5. 2 depicts a positive and statistically significant correlation between remittance inflows and real GDP per capita in SSA countries.

Seychelles, Mauritius, Nigeria, Cabo Verde, Lesotho, South Africa, Swaziland, Namibia, and Angola appear to be outliers. Generally, Figure 5.7 indicates an overall negative relationship between remittance inflows and the level of economic growth in SSA countries. Countries that depend on remittances have a low level of economic growth. On average, however, most countries strike the balance in terms of remittance contribution to GDP per capita in the region. Rwanda is located slightly below the line of fit with an estimated percentage of remittances to GDP per capita of 6.8% in 2012. This makes it an interesting case study. The next section explains the different econometric techniques employed in the remittance-growth effect analysis in SSA countries.

5.2 Econometric Techniques

To examine the effect of remittances on economic growth in SSA countries, the study employed a panel data framework. The empirical model (1) suggests that economic growth is determined by the past year's real GDP per capita, the percentage of remittances to GDP and a set of other control variables. The primary focus of this empirical model is to examine the nature and significance of the remittance variable and the coefficient of the related interaction term in the growth model. This chapter follows four stages of analysis: First, a panel of random effect analysis is used to examine the impact of remittances on economic growth in SSA countries. The rationale behind the panel data analysis is to provide heterogeneity in the estimated coefficients and to capture dynamic effects in my endeavor to control for the endogeneity problem. I address this problem by including the country specific effects and testing that the empirical model is suitable for estimating economic growth. The best models are fixed and random effect models. I employ a random effect estimation technique to cater for the interaction effect of remittances and the Rwanda dummy.

Second, instrumental variable techniques are introduced to address the problem of endogeneity. Third, I examine whether the impact of remittances on growth in SSA countries is conditioned by the quality of institutions, the level of development and human capital development variables. To operationalize the latter, a number of interaction variables have been introduced to empirically examine which plausible conditions affect the remittance-growth effect in SSA countries. Lastly, I contextualize the analysis to Rwanda by introducing an interaction term of a Rwanda dummy and remittances (in model 1) to determine the growth effect of remittances in Rwanda. To this end, a further analysis is carried out, using estimation techniques of cointegration and ECM estimation techniques to examine the long-

run relationship between remittances and economic growth and the direction of long-run causality between remittances and economic growth in Rwanda.

To operationalize all the above steps, first a benchmark model is estimated, which examines the impact of remittances on economic growth in SSA countries using random effects technique. I first specify a simple log-linear Cobb-Douglass production function. Several researchers in the field have used this empirical approach (including Addison, 2004; Akinpelu et al. 2013; Catrinescu et al. 2006; Fayissa, 2010; Muhammad and Umer, 2010). The general estimated model is given below:

$$LogY_{it} = \beta_0 + \beta_1 Y_{it-1} + \beta_2 Rem_{it} + \beta_3 FDI_{it} + \beta_4 GCF_{it} + \beta_5 OPEN_{it} + \beta_6 ENR_{it} + \eta_i + \varepsilon_{it} \quad (1)$$

Where,

$LogY_{it}$ is measured as the log of real GDP per capita in country I at time t; Y_{it-1} is the logarithm of real GDP per capita lagged one year; Rem_{it} is a measure of remittances as a share of GDP (as % of GDP); FDI_{it} is the measure of FDI as a share of GDP used to capture the effect of external sources of capital on growth; GCF_{it} is the gross fixed capital formation as a percentage of GDP used as a proxy for investment in the physical capital; $OPEN_{it}$ is the measure of openness to trade for each country under consideration, measured as the ratio of summation of exports and imports to GDP to capture the impact of trade and openness of the economy on economic growth; and ENR_{it} is the measure of school enrollment, measured as secondary enrollments as a percentage of total (% of relevant age group) (see Schultz, 1980; Romer,1986; Lucas (1988; Barro, 1990 cited in Fayissa and Nsiah, 2010). The variable of ENR is employed as measure of investment in human capital and is expected to have a positive effect on the economic growth of developing countries. η_i is a country-specific time invariant effect and ε_o is an error term.

Second, I address the problem of endogeneity by employing a GMM estimator as put forward by Arellano and Bond (1991; see Catrinescu et al. 2006; Aggarwal et al. 2011). Recent studies on remittances and economic growth have used this technique as a remedy for the lack of a good instrumental variable in the econometric estimations.

To specify the GMM model, Ferdaous (2016: 8)equation (1) written as follows:

$$Y_{it} = \alpha' Y_{it-1} + \beta' X_{it} + \dot{\eta}_i + \varepsilon_{it} \quad (2)$$

Where,

Y_{it} is log of real GDP per capita, Y_{it-1} is log of GDP per capita lagged one year, X_{it} is a vector of explanatory variables, $\dot{\eta}_i$ is unobserved country-specific effects, α' β' are coefficients of parameters to be estimated, and εit is the time-varying error tem.

To eliminate unobserved heterogeneity ($\dot{\eta}_i$), Arellano and Bond (1991, cited in Ferdaous, 2016) suggest first-differencing equation (2) to eliminate the unobserved country-specific effect, since the disturbance does not vary with time. This also eliminates the omitted variable bias and it is known to overcome endogeneity by using lagged values of the explanatory variables as instruments. This leads to model 3:

$$\Delta Y_{it} = \alpha' \Delta Y_{it-1} + \beta' \Delta X_{it-1} + \gamma' \Delta Z_{it} + \varepsilon_{it} \quad (3)$$

Where,

ΔY_{it} is the first differenced natural log of real GDP per capita in country i during time t; ΔY_{it-1} is the lagged differenced of the dependent variable; ΔX_{it-1} is a vector of lagged level and predetermined and endogenous variables; Z_{it} is a vector of exogenous variables; and α, β and γ are parameters to be estimated (for example see Arellano and Bond, 1991). I estimate the coefficients of the variables to examine the joint effects of remittances and economic growth in SSA countries using the GMM and 2SLS estimation models. This leads to the third step, examining whether the impact of remittances on growth in SSA countries is conditioned by the quality of institutions, the level of development and human capital development.

5.3 Factors Influencing the Remittance-Growth Effect in SSA Countries

In this section, I employ a random estimation technique to examine whether the remittance-growth effect is conditional on the institutional and development factors in SSA countries. At this level, I employ the key conditions put forward by several empirical findings and conclusions in the field of remittances and economic growth (Matuzeviciute and Butkus, 2016; Valeriani and Peluso, 2011; Catrinescu et al. 2009; Catrinescu, et al. 2006) such as the country's level of development, financial development, human capital development and institutional quality. The political stability and regulatory quality are employed to examine institutional quality. The assumption is that political stability and regulatory quality enable the creation of a policy framework that ensures economic stability and an open business regulatory environment that fosters formal remittance transfers and the channeling of these inflows into productive investments, which in turn promote growth and development in SSA countries.

For estimation purposes, I adopt the baseline static model to analyze the conditional effect of the factors highlighted above. I introduce the variables that proxy institutional and development factors separately and interact them with remittance percentage to GDP per capita to gauge how their interaction term influences economic growth (GDP per capita) in the region. In a similar vein, a number of interactions variables are factored in to empirically

estimate which plausible conditions affect the growth effect of remittances in SSA countries. By doing so, I modify model 1 and estimate the following four conditional random effect models:

$$LogY_{it} = \beta_0 + \beta_1 InGDP_{it}\text{-}1 + \beta 2 Rem_{it} + \beta 3 (X*Rem)_{it} + \beta 4 X_{it} + \eta_i + \mu_t + \varepsilon_{it} \quad (4)$$

Where,

$InGDP_{it-1}$ is the logarithm of the initial real GDP per capita lagged one year to proxy for the country's level of economic development in SSA countries; Rem_{it} is the remittance percentage to GDP; $(X*Rem)_{it}$ is the interactive term of the conditional variables that proxy institutional development level and human capital development in SSA countries interacted with the remittance percentage to GDP to explain Y_{it} . For the purpose of this study, $(X*Rem)_{it}$ represents the following conditional variables: 1) the development level, where the proxy is the logarithm of the initial real GDP per capita lagged one year ($InGDP_{it-1}$); 2) the political stability and regulatory quality variables, which are proxies for the institutional variable; 3) the education variable, which is the measure of school enrollment, measured as secondary enrollments as a percentage of total, and a proxy for human capital development; and 4) the percentage of credit to private sector to GDP (CPS/GDP%) as a measure of financial development, which is a proxy for financial sector development. Other control variables (represented by X_{it}) are explained above.

At this level, it is worth noting that the parameters of interest that are used to draw the conclusion are β2 and β3 in the four estimated models, based on model 4 conditions. With these parameters, I test their respective signs and significances, as well as their conditional marginal effect on real GDP per capita (Y_{it}).

In the fourth step, I contextualize the analysis to Rwanda as a case study to examine the remittance-growth effect in Rwanda. I adopt a two-step nested analysis: First, I introduce an interaction term of remittances and the Rwanda dummy (Rem*Z) in model 1. To capture the impact of the interactive term and other control variables included in X_{it-1} in model 1 of table 5.3, I modify the specification further to provide equation 5 below. The main objective is to estimate and evaluate the coefficients of remittances and those of the interactive term in the model 5. Brambor et al. (2006) argue that a conditional hypothesis can easily be tested using multiplicative interaction models. I follow and implement this assertion. Y_{it} and X_{it-1} are continuous variables, while Z is a dichotomous variable that equals 1 (in my panel dataset) when the required condition is met and 0 otherwise.

$$Y_{it} = \alpha' Y_{it}\text{-}1 + \beta' X_{it}\text{-}1 + \lambda Z_{it} + \delta (Rem*Z)_{it} + \varepsilon_{it} \quad (5)$$

Where,

Z is the Rwanda dummy (Rw) and "Rem*Z" is the interactive term of the Rwanda dummy (Z) and remittances (Rem) explaining Y_{it} with other control variables explained above. Using equation 5, I examine the marginal effect of X_{it-1} on Y_{it} when Z_{it} is present. In other words, I test how the marginal effect of X_{it-1} is conditional on the value of Z_{it}.

Last, to validate the effect of remittances on economic growth in Rwanda, I further employ the cointegration test and ECM to examine the remittance-growth effect and the direction of long-run causality between remittances and economic growth in Rwanda using annual time series data of Rwanda for the period from 1980-2014. I test for stationarity of data using Augmented Dicker-Fuller (ADF) test and employ the Johansen test of co-integration to examine whether the two-series are cointegrated and have a long-run equilibrium relationship. Several researchers have used these techniques to assess such causality (Siddique et al. 2010; Shafiq et al. 2012). The underlying hypothesis is that there is a long-run relationship between remittances and GDP per capita and that the direction of causality runs from remittances to GDP per capita in Rwanda. I test this hypothesis using the Johansen test of cointegration and error correction model.

$$\Delta Y_t = \beta_0 + \beta_1 \Delta X_t + \gamma(X_{t-1} - Y_{t-1}) + \mu_t \quad (6)$$

Where,

ΔY_t is the first differenced variable of GDP per capita, γ,is the coefficient of error correction term.

$(X_{t-1} - Y_{t-1})$ is the error correction term and μ_t has zero mean given $\Delta X_t \quad X_{t-1}, Y_{t-1}$ are all past values of X_t andY_t. Y_t is the Rwandan real GDP per capita and X_{t-1} are the lags of remittances. The empirical results of the analysis are presented below.

5.4 Empirical Results and Discussion

In this section, I present the results of the empirical models estimating the remittance-growth effect in SSA countries and Rwanda in particular. First, I present the results of the panel data analysis with the random effects model employed to analyze the effects of remittances on GDP per capita in 45 SSA countries and the results of factors conditioning the remittance-growth nexus in SSA countries. Second, I present the results of the instrumental variable estimation techniques (2SLS and GMM) addressing the problem of endogeneity. Then, I present the results of the interaction term of remittances and the Rwanda dummy, and lastly, the results of the Johansen test of cointegration and the ECM.

5.4.1 Remittances and Economic Growth in SSA countries

Table 5.3 presents the results of the random effects models examining the remittance-growth effect in SSA countries and Rwanda in particular. In Table 5.3, the results of several tests of model 1 and 2 to obtain a robust and best fit of the data are shown.

Table 5. 3: Results of Random Effects Models for SSA Countries

	(Model 1)	(Model 2)
	RE	Interaction
VARIABLES	Log GDP	Log GDP
Lagged GDP per capita	0.990***	0.991***
	(0.0119)	(0.0123)
Lagged GCF % GDP	0.00280	0.00244
	(0.0218)	(0.0219)
Lagged Openness % GDP	0.0112**	0.0118**
	(0.00549)	(0.00577)
Lagged FDI % GDP	0.0102	0.00991
	(0.00807)	(0.00813)
Lagged Education	0.0388***	0.0389***
	(0.0128)	(0.0129)
Rwanda Dummy	–	0.0139
	–	(0.0179)
Lagged Rem % GDP	0.0117	0.0124
	(0.0104)	(0.0108)
Lagged Rem*Rwanda	–	0.0397***
	–	(0.0132)
Constant	-0.259*	-0.276*
	(0.149)	(0.158)
Observations	632	632
Number of iso3n	40	40

Notes: All independent variables are lagged one year and they are in logs. Robust Standard errors are in parentheses: * p<0.05, ** p<0.01, *** p<0.001

Model 1 of Table 5.3 presents the estimation results of random effect (RE) without the interaction term, while model 2 presents the results of the random effects model with interaction term. The 0.8846 values of R-squared for the random effects model shows that

88.46% of variation in the real GDP per capita is explained by the variation in the predictor variables used in the RE model.

The endogenous growth model and the national account model claim that remittances affect economic growth and development through their mediating effect on the macroeconomic variables such as GDP per capita, human capital development, FDI, etc. The result of this study supports those claims. As depicted in Table 5.3, there is no significant effect of remittances on GDP per capita in SSA countries. In the case of SSA countries, failure to depict average significant effect of remittances on growth in SSA countries does not necessary imply that remittance inflows do not affect economic growth in the region. Instead, this evidence seems reflect variations in terms of the remittance-growth effect in SSA countries and factors influencing the growth effect of the remittances in the region. Although there is no existing empirical study that has investigated the heterogeneity of SSA countries in terms of the remittance-growth effect, this study suggests that the remittance-growth effect plays out differently within SSA countries. Moreover, remittances could be affecting economic growth in the region through other channels, such as financial development, investments and education, as revealed by the results in Table 5.3 (column one and two). Besides the variables for education and openness, other variables show no significant effect on GDP per capita in the region. Results from tests show the statistically significant positive effect of remittances and FDI on GDP per capita being overshadowed by the influence of lagged GDP per capita in the model. This seems to reflect the stronger influence of the level of previous growth (proxied by real GDP per capita) on the future growth of SSA countries than other control variables. Other than that, these results are in line with the conditional convergence theory and most studies which argue that developing economies' per capita income tends to grow faster than that of developed economies, because their diminishing returns (particularly capital) are not as strong as they are in capital-rich countries (Mathur, 2005).

The results of two models indicate a positive and statistically significant effect of education and trade openness on GDP per capita in the region. A 1% increase in human capital investment measured by secondary school enrollments as a percentage of total increases GDP per capita with 3.88% in the two models. A 1% increase in the percentage of summation of exports and imports to GDP per capita results in a 1.12% and 1.18% increase to GDP per capita, respectively. Apart from the difference in the degree of significance and the magnitude of the coefficients, the results from the two models are comparable, but the effect of initial GDP per capita, trade openness and education on GDP per capita is high

compared to the coefficients of remittances, FDI and GCF in the region. These results are robust with few standard errors. Based on the estimation results, the findings in the SSA region are not surprising; they are consistent with the theories this study is embedded in and other studies on SSA countries (Fayissa and Nsiah, 2010; Atanda and Charles, 2014). This confirms the significant effect of trade openness and human capital as determinant factors for economic growth in the region.

5.4.2 Results of Instrumental Variable Techniques

To address the problem of endogeneity in the results, instrumental variable techniques and instrumented variables have been employed. In this section, I present the results of the remittance-growth effect with application of instrumental variable techniques of 2SLS and 2GMM. I extend the random effect model with an interaction term and employ the instrumental variable estimation techniques to test the validity of the internal instruments. The two estimation techniques are based on internal instruments only. Thirteen instruments were used in the specifications, disaggregated as follows: 1, the lagged log of remittances to GDP as instrumented. The seven variables used as instrumented instruments are the initial lagged log of GDP per capita, the lagged log of the total percentage of school enrolment, FDI, GCF, the openness, the interaction term of remittances to GDP, and the Rwanda dummy. The six variable lags (from lag 2-7) of initial GDP per capita were used as excluded instruments in both techniques. Accordingly, Table 5.4 presents the estimation results of 2SLS and 2GMM estimations on the growth effect of remittances in SSA Countries.

I find no significant difference in the results of instrumental variable estimations and those in Table 5.3. As depicted in Table 5.4, the results show no statistically significant effect of remittances on GDP per capita in the long run across the SSA countries, but there is a negative effect in the short run. This also seems to confirm that there is no homogenous remittance-growth effect across the SSA countries and the effect might vary depending on the country-specific conditions, which was not catered for in the model. I cater for this aspect using Rwanda as the case study in the next section.

Table 5.4: Remittance-Growth Effect in SSA Countries: Results of Instrumental Variable Techniques

	Model 1	Model 2	Model 3
VARIABLES	2-SLS D2.LogGDP	2-GMM LogGDP	2-GMM LogGDP
Lagged D2. Rem % GDP	-0.0760**	–	–
	(0.0303)	–	–
Lagged D2. GDP	-0.416***	–	–
	(0.0905)	–	–
Lagged D2. Education	0.0127	–	–
	(0.119)	–	–
Lagged D2. FDI % GDP	-0.00115	–	–
	(0.00881)	–	–
Lagged D2. GCF % GDP	0.0351	–	–
	(0.0322)	–	–
Lagged D2. Openness % GDP	0.0647	–	–
	(0.0561)	–	–
Lagged D2. Rem*Rwanda	0.450	–	–
	(0.615)	–	–
Lagged Rem % GDP	–	0.000102	-0.00187
	–	(0.00399)	(0.00481)
Lagged GDP	–	0.987***	0.986***
	–	(0.0291)	(0.0323)
Lagged (Log)Education	–	0.0358*	0.0400
	–	(0.0213)	(0.0267)
Lagged FDI % GDP	–	0.00596	–
	–	(0.00800)	–
Lagged GCF % GDP	–	0.0249	–
	–	(0.0516)	–
Lagged Openness % GDP	–	0.00796	0.00974
	–	(0.00664)	(0.00633)
Rwanda Dummy	–	-0.714	-0.710
	–	(0.656)	(0.520)
Lagged Rem*Rwanda	–	0.298	0.294
	–	(0.268)	(0.210)
Lagged FDI % GDP	–	–	-0.000615
	–	–	(0.00103)
Lagged GCF % GDP	–	–	0.00205
	–	–	(0.00312)
Constant	0.0792**	-0.212	-0.202
	(0.0341)	(0.167)	(0.208)
Observations	366	520	539
R-squared	0.030	0.985	0.985

Standard errors in parentheses *** p < 0.01, ** p < 0.05, * p < 0.1

The results of 2SLS[11] reveal that the null hypothesis that variables are exogenous and instruments are weak is rejected and therefore the alternative hypothesis that variables are

[11] Model 1 of Table 5.2 presents the results of the second differenced equation of the 2SLS estimation technique following Arellano and Bond's (1991) specification to increase robustness of Singh (2010). In this model, data are transformed by differencing, ΔY_{it-2} and ΔX_{it-2}. The double transformation of the data effectively drops the number of observations (first observations for each individual and its R^2 values), but improves the validity of instruments (see Anderson and Hsiao, 1982). The results indicate a negative coefficient but statistically significant effect of remittances on GDP per capita. This suggests that there is a negative effect of remittances on all SSA countries in short run. Moreover, the results of model 1 indicate that the hypothesis testing of endogeneity has P-values of less than 5%, thus rejecting null hypothesis that variables are exogenous and accepting the alternative hypothesis that variables are endogenous. The results

endogenous is accepted. The results of the 2GMM estimation confirm that estimates do not have a weak instrument problem and are valid and correctly specified. Thus, the null hypothesis that instruments are uncorrelated with the error term and the excluded instruments are correctly excluded from the estimated equation is accepted. In the next section, I extend the analysis to estimate the plausible institutional and development variables affecting the growth effect of remittances in the SSA region.

5.4.3 The Conditional Effects of the Remittance-Growth Nexus in SSA Countries

The findings reveal a moderate effect of remittances on growth in SSA countries. This section empirically examines factors influencing the remittance-growth effect in the SSA region. It estimates how institutional and development variables condition the growth effect of remittances in SSA countries. Table 5.5 presents the results of institutional and development factors conditioning the remittance-growth effect in SSA countries.

Table 5.5 reveals mixed findings about the conditional effect of the institutional and development factors on the remittance-growth effect in SSA countries. Generally, the results in Table 5.5 depict a positive and statistically significant effect of the interaction term of the country's level of development, financial development, education and remittances on economic growth, while the institutional variables adversely affect the growth effect of remittances in the SSA region. The findings confirm the mediating role of the level of development (proxied by real GDP per capita) influencing the growth impact of remittances in SSA region.

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of F-test values is 14.3 greater than the critical value (0.012) and the R-squared, 0.03, thus rejecting the hypothesis that instruments are weak. These results confirm the literature, which affirms that if the F-statistic exceeds 10, the instruments are sufficiently strong (Staiger and Stock, 1997; Stock, Wright, and Yogo, 2002). Model 2 and 3 present the results of endogeneity and weak instrument specifications using the 2GMM estimation technique. Results of endogeneity in model 3 indicate that the level of significance is 1.2% less than the 5% significant level, thus rejecting the null hypothesis that variables are exogenous and accepting the alternative hypothesis that variables are endogenous. The results of the F-statistic for weak instruments using Hansen's J test (for overidentifying) indicate that the F-statistic is above the critical value, at 5% significance level (2.29763 > 0.1296 (critical values)) and the R-squared values are 0.215 less than 2.29763. The results safely indicate that the estimates do not have a weak instrument problem. There are valid and correctly specified. Therefore, the null hypothesis that instruments are uncorrelated with the error term and the excluded instruments are correctly excluded from the estimated equation is accepted.

Table 5.5: Results of Factors Influencing the Remittance-Growth Effect in SSA

INDEPENDENT VARIABLES	Dependent variable is log GDP per capita				
	(Model 1)[12]	(Model 2)	(Model 3)	(Model 4)	(Model 5)
Rem% GDP	-0.0384	-0.0468	-0.626**	0.0471	-0.143
	(0.0368)	(0.115)	(0.257)	(0.104)	(0.0968)
FDI % GDP	0.0802***	0.174***	-0.185*	0.110***	0.103***
	(0.0177)	(0.0261)	(0.0972)	(0.0415)	(0.0311)
Openness	-0.0670***	-0.446***	-0.172***	-0.583***	-0.351***
	(0.0221)	(0.0631)	(0.0426)	(0.0488)	(0.0460)
Rem*Init'l Dev't Level	0.0241*	–	–	–	–
	(0.0123)	–	–	–	–
Initial Dev't Level	0.785***	–	–	–	–
	(0.0556)	–	–	–	–
Rem*Fin. Dev't	–	0.0718**	–	–	–
	–	(0.0316)	–	–	–
CPS%GDP	–	0.154*	–	–	–
	–	(0.0833)	–	–	–
Rem*Reg Quality			0.0936	–	–
	–	–	(0.0591)	–	–
Reg Quality - Estimate	–	–	0.676***	–	–
	–	–	(0.128)	–	–
Rem*Political Stability	–	–	–	-0.0199	–
	–	–	–	(0.0307)	–
Pol Stability - Estimate	–	–	–	0.0859	–
	–	–	–	(0.110)	–
Education	–	–	–	–	0.425***
	–	–	–	–	(0.0712)
Remittances*Education	–	–	–	–	0.0936***
	–	–	–	–	(0.0356)
Constant	2.450***	13.79***	11.66***	17.12***	11.20***
	(0.707)	-1.251	(0.746)	(0.899)	(0.819)
Observations	996	944	44	115	651
Number of iso3n	42	41	6	18	40

Standard errors in parentheses; *** p < 0.01, ** p < 0.05, * p < 0.1

The results (in model 1 of Table 5.5) reveal a negative and statistically insignificant coefficient of remittances, but a positive and significant coefficient of the interaction term of the country's level of development and remittances. Concerning the conditioning role of the country's level of development on the remittance-growth effect, results reveal a negative and significant marginal effect (-0.0384+0.0241 = -0.0143) of remittances on growth, providing strong evidence that the marginal effect of remittances in SSA countries increases with the country's level of development. These results are not surprising; they are in line with the existing claims arguing that remittances promote economic growth in relatively developed countries and that the remittance-driven growth effect is less pronounced in less developed

[12] **N.B:** Model 1 is an interaction of remittances and initial level of development and its level effects; Model 2 is an interaction of remittances and financial development and its level effects; Model 3 is an interaction of remittances and regulation quality and its level effects; Model 4 is an interaction of remittances and political stability and its level effects, while Model 5 is an interaction of remittances and education variable and its level effects.

countries (Matuzeviciute et al. 2016 Niimi and Ozden, 2006). This can be attributed to the fact that such countries (for example SSA countries) are still struggling with structural issues, the institutional environment and the country's capacity to take advantage of such external capital inflows. On average, the existing institutional and policy environment do not encourage remittance transfers and their productive use to spur growth. The premise is that a conducive institutional environment that fosters remittance inflows and channeling these inflows into productive investments spurs economic growth. Several empirical studies that put strong importance to the conditional role of institutions in determining remittance inflows and how these inflows are deployed into productive investments that spur economic growth (see Kapur (2004:28; Catrinescu et al. 2006). However, across SSA region, countries differ in terms of the level of development and the institutional and policy environment that could enhance remittance inflows and encourage the channeling of these inflows into productive investments that spur further growth and development in the region.

Model 2 of Table 5.5 shows that financial development complements the growth effect of remittances in the SSA region. The findings indicate a negative and statistically insignificant coefficient of remittances (-0.0468), but the coefficient of the interaction term of remittances and financial development is positive and statistically significant (0.0718**). This provides strong evidence that the conditional marginal effect (positive 0.025) of remittances on economic growth is complemented by the prevailing institutional quality of financial institutions in the SSA region. These results are consistent with the previous findings on SSA countries claiming the importance of financial sector development in enhancing formal remittance transfers, access to financial services, increase of banking liquidity and channeling these funds into productive investments that could spur growth in the region. Indeed, (Nyamongo et al. 2012; Abida and Sghaier, 2014) argue that a high degree of financial development allows migrants to send money home cheaply, fast and safely. If these resources are transmitted in large amounts, this would stimulate competition among financial institutions and institutional reforms with a view to channeling remittances into productive investments.

The results of the analysis show the conditional effect of the institutional and policy framework on the remittance-growth effect. The results (model 5 of Table 5.5) of the interaction effect of remittances and education confirm the growth effect of remittances through human capital development in the SSA region. Accordingly, the findings indicate a negative and insignificant coefficient of remittances (-0.143) on growth, while the coefficient of the interaction term of remittances and education is positive and statistically significant

(0.0936***). The negative conditional marginal effect of the interaction term of remittances and education (-0.049) suggests that remittance-education driven growth decreases in countries with a smaller institutional and policy framework and fewer human capital development policies, which negatively affects the remittance-growth effect through human capital development in SSA countries. This implies that the prevailing institutional and policy frameworks are not pro-human capital development in these countries. These findings are in line with the endogenous growth theory and several previous empirical studies (Rapoport and Docquier, 2006 Adenutsi, 2010; Adams Jr. 2011). However, the positive effect of remittances on economic growth is influenced by the quality of the institutional and policy framework which affect the way remittances are utilized to impact economic growth in the region. Several studies have shown that most SSA countries are still struggling to achieve recommendable human development indicators. This has to do with the prevailing institutional and policy environment of human capital development variables in the region, which have bearing effect on the growth-impact of remittances in the region.

Specifically, I apply institutional quality variables to depict their mediating effect on remittance-growth outcomes in the region. I employ both the institutional variable of political stability and that of regulatory quality. The proposition is that political stability and an efficient regulatory environment encourage formal remittance inflows and the channeling of these inflows into productive investments that spur growth and development in the recipient country. However, the findings reveal that the remittance-growth effect in SSA countries is negatively influenced by the quality of institutions in the region. Accordingly, the findings indicate that the variable for regulatory quality does not have a significantly meaningful positive conditioning effect on remittances (-0.626**) in the region. Indeed, it has an independent positive effect on growth, yet it does not seem to serve as a meaningful conditioning variable on the remittance-growth nexus, while the interaction term of remittances and regulatory quality is positive but insignificant (0.0936). Moreover, the negative sign (-0.5324) in the marginal effect of remittances on GDP per capita implies that a high-quality regulatory framework does not necessarily make remittances more growth-promoting. Rather, having very strict regulatory framework has a growth-undermining effect in the region. Practically, such a system encourages the unproductive use of remittances characterized by market imperfection, lack of competition, exclusive agreements which leads to monopoly, a lack of transparency and information asymmetry, which in turn leads to a high cost of formal transfers and more remittances being transferred through informal channels. Indeed, Orozco (2013) claimed that in most African countries where exclusive

agreement prevails, competition is restricted; costs are therefore high and people ultimately resort to informal payment and transfer mechanisms. Thus, institutions do matter.

Similarly, the results in the model 4 of Table 5.5 reveal a negative conditional effect of political stability on the remittance-growth effect. The findings indicate a positive and insignificant coefficient of remittances and the interaction term of remittances and political stability, but the marginal effect of the remittances-growth nexus and political stability turns out to be positive (0.027), though insignificant. These results suggest a strong influence of political stability on the remittance-growth effect in the region, though the effect varies between countries. However, the negative effect of this variable seems to be associated with factors such as political instabilities, corruption, government ineffectiveness and structural issues that affect the socio-economic environment. These results are in line with several empirical studies (Catrinescu et al. 2006; Abdih et al. 2008) arguing that a favorable institutional environment is a prerequisite condition for SSA countries to reap the growth effect of remittance inflows in the region. Essentially, remittances will not be of any development use if there are no schools, hospitals, teachers, access to financial services, or if the country is characterized by political instabilities, strict regulations and a lack of inclusive development policies.

To sum up, this section examined the effect of remittance inflows on economic growth in SSA countries and the conditional effects of institutional and development variables on this effect. The cross-country analysis of SSA countries finds no statistically significant impact of remittances on economic growth in the SSA region. This evidence seems to suggests that the effect of remittances on economic growth varies within SSA countries, implying that the effect of remittances plays out differently within the region, but remains moderate across the region. The findings indicate that the remittance-growth impact is positively influenced by the country's level of development, financial development and education. It is however adversely affected by the quality of institutional variables in the region, such as political instabilities and strict regulations. The same conditional factors of the institutional and policy environment and the country's level of development play out differently within and across SSA countries. This implies that both the remittance-growth effect and the institutional and policy framework are country-specific within the region. Chang (2010) observes that the country cross-section results themselves are problematic and complex on empirical analysis of institutional variables. Importantly, the issue is complicated by the lack of a theoretical framework explaining the conditional effect of policy and institutional environment in the remittance-growth effect. Access to data in developing countries like the SSA region is also a

hurdle in understanding how institutional quality and development variables affect remittance-development outcomes. I address this issue by contextualizing the analysis to Rwanda as a case study. I presume Rwanda, as a country that has demonstrated an impressive positive performance in a set of institution and development variables over the last two decades, provides a credible important case for analysis in the context of the remittance-growth effect. It also provides unique, comprehensive and credible data on remittances and development variables of interest to this study. The macro data, household survey data, primary data from the diaspora and my personal professional experience in the field provide an opportunity for accessibility of the right data for the analysis.

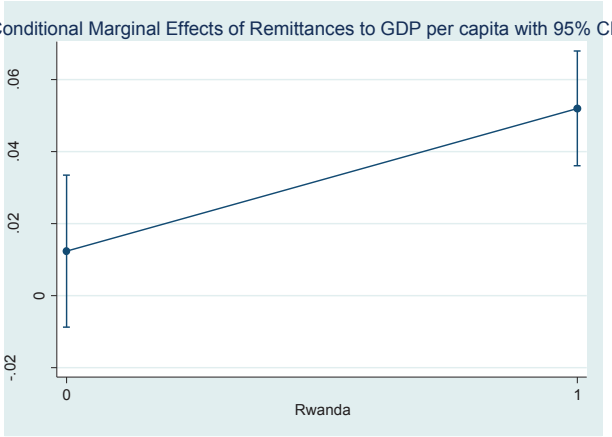
As discussed in Chapter Four, the economic development and institutional performance Rwanda has registered over the last two decades, coupled with the recent impressive policies geared to engage its diaspora in the national development, present an interesting case for the remittance-growth effect analysis. In the next section, I specifically examine the effects of remittances on economic growth in Rwanda.

5.5 Remittances and Economic Growth in Rwanda

This section presents findings about remittances and economic growth in Rwanda. The findings contextualize the analysis to the country level. Table 5.3 above presents the results of the interaction term of remittances and the Rwanda dummy on GDP per capita in Rwanda in relation to other SSA countries. This section presents the results of the Johansen test of cointegration and the ECM employed to estimate the long-run relationship between remittances and economic growth and the direction of causality between remittances and economic growth in Rwanda.

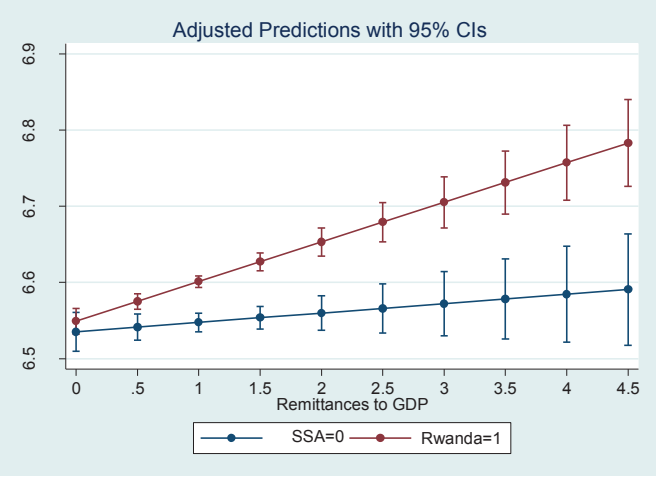
The remittance-growth effect holds in Rwanda (see model 2 in Table 5.3). This is pronounced when an interaction term of remittances and the Rwanda dummy is introduced in the random effect model. The coefficient of remittances is positive but insignificant (0.0124), while the coefficient of the interaction term of remittances and the Rwanda dummy is positive and statistically significant (0.0397***). This provides strong evidence in favor of the positive marginal effect of remittances on GDP per capita in Rwanda. In other words, the marginal effect of remittances on GDP per capita increases as more remittances flow to Rwanda. The validity of this significance is verified by predicting the margin effect of remittances on GDP per capita in Rwanda in relation to the other SSA countries. The results of the predictive marginal effects are presented below in Figure 5.8 and 5.9.

Figure 5.8: Conditional Marginal Effects of Remittances on GDP per Capita in Rwanda and Other SSSA Countries



Source: *Data from World Bank Dataset*

Figure 5.9: Adjusted Predictions of Effects of Remittances on GDP per Capita in Rwanda and Other SSA Countries



Source: *Data from World Bank Dataset*

As is indicated in Figure 5.8 and 5.9, the predictive marginal effect of remittances to GDP per capita in Rwanda is significant and higher (the confidence bands do not overlap with zero; they are above zero) than in the other SSA countries where the effect is not significant. The plot in Figure 5.8 indicates the effects on linear prediction of remittances to GDP per capita in Rwanda in relation to other SSA countries at different values. As illustrated in both

figures, the conditional marginal effect of remittances on GDP per capita in Rwanda is higher than that in the other SSA countries and statistically significant. In other SSA countries, the effect is positive but flatter and not significant. For Rwanda, the estimated confidence interval is statistically significant, confirming that the conditional marginal effect of remittances to GDP per capita in Rwanda increases as more remittances flow to the country.

The results of the cointegration and error correction estimation techniques present a statistically significant long-run relationship between remittance inflows and economic growth in Rwanda. These estimation techniques are employed to determine whether there is a remittance-growth effect in Rwanda and to validate that effect. Table 5.6 presents the results of unit root of related variables, maximum lags selected. Then, the results of the Johansen test of co-integration and the ECM are presented. Since the focus is on Rwanda, I used Rwandan data only for the analytical purpose.

Table 5.6: Summary of Results for Unit Root Tests

Variable	**Order of integration**	**P-Value**	**Test-Stat**	**5% Critical Value**
(GDP per capita)	I(1)	0.000	-4.289	-2.980
FDI(% to GDP)	I(1)	0.002	-3.425	-2.980
Rem (% to GDP)	I(1)	0.000	-4.985	- 2.980
Openness(% to GDP)	I(1)	0.000	-6.115	-2.980
GCF(% to GDP)	I(1)	0.000	-5.599	-2.980
Education (% Gross Sec)	I(2)	0.002	-3.741	-3.600

Source*: Stata 14*

Augmented Dickey-Fuller (ADF) and Philips Peron (PP) tests were employed to estimate the stationarity of the variables of interest. Accordingly, the results in Table 5.6 indicate that the real GDP per capita, the percentage of remittances, openness, FDI and GCF to GDP per capita, are integrated at level I(1), that is at first difference. And their respective P-values are less than critical values at 5% level of significance. Education is non-stationary and gains stationarity after being differenced at second level. Therefore, the data are non-stationary time-series integrated at the order of one I(1) and I(2). A visual inspection of the data shows a clear upward trend for both the GDP per capita and remittances in Rwanda. The highest order of integration of the variables is two. These results permit us to proceed to conduct the

cointegration test and the vector error correction model (VECM) for remittances and real GDP per capita in Rwanda. The exercise starts with determining the maximum lags to be used. The results of the lag selection are presented in Table 5.7.

Table 5.7: Number of Lags Selected

Sample: 1983-2013, but with a gap Number of = 25

No of Lags	**LL**	**LR**	**df**	**P**	**FPE**	**AIC**	**HQIC**	**SBIC**
0	167.376		4		0.002022	-0.539005	-0.40378	-0.051455
1	244.799	15.485	4	0.004	0.001529	-0.838389	-0.649073	-0.155819*
2	278.519	6.744	4	0.150	0.001668	-0.78815	-0.544744	0.08944
3	340.539	12.404*	4	0.015	0.001487*	-0.9964313	-0.666816*	0.108298

Notes: Endogenous: GDP per capita and Rem (% to GDP). **Exogenous**: Education (% Gross Sec), GCF (% to GDP), openness (% to GDP), FDI (% to GDP). LL = log likelihood, LR = likelihood ratio, df = degree of freedom, P = probability, FPE = final prediction error, AIC = Aikaike Information Criterion, HQIC = Hannan Information Criterion, Bayesian Information Criterion. For further detail see Sukati (2013)

The results in Table 5.7 indicate that the FPE, AIC, HQIC, and SBIC choose maximum lags of three. This demonstrates that the bivariate model of remittances and GDP per capita is explained by three lags. The results of the cointegration test are a necessary prerequisite for the ECM. The results of the Johansen test of cointegration doubly confirm the existence of cointegration among remittances and GDP per capita. In other words, there is a long-run relationship between remittances and GDP per capita in Rwanda (see Table 5.8 below). Thus, the null hypothesis is accepted, confirming a cointegrating relationship between the two variables. These results provide a basis for testing the long-run causality between remittances and GDP per capita using the ECM. Table 5.8 presents the results of the cointegration test of remittances and economic growth in Rwanda.

The results of the cointegration test allow us to test the long-run causality between remittances and GDP per capita using the VECM. Tables 5.9, 5.10 and 5.11 present the results of the VECM, results of serial correlation on the long-run causality between remittances and GDP per capita, and the results of the normality test for distribution of residuals using the Jarque-Bera test, respectively.

Table 5.8: Results of the Cointegration Test

Trend: Constant		No of Observations: 34
Sample:1981-2014		Lags: 1
Max Rank	**Trace Stat**	**Critical Values (at 5%)**
0	12.5951*	15.41
1	0.2441	3.76
2		
Max Rank	**Max Statistic**	**Critical Value (at 5%)**
0	12.351	14.07
1	0.2441	3.76
2		

Notes: Standard errors in parentheses: *** p < 0.01, ** p < 0.05, * p < 0.1; No of Obs: 34. (*) indicates the rejection of the hypothesis at 5% level. Trace statistics indicate two cointegrating equations at the 0.05 level but not the Max-eigen value statistics. The time series = GDP per capita and remittance % GDP. For more technical details, see Natanelov et al. (2013).

Table 5.9: Results of the VECM

	(Model 1) VEC	(Model 2)
VARIABLES	D_LogGDP	D_Log Rem%GDP
Error correction term (L._ce1)	-0.240***	0.263**
	(0.0777)	(0.105)
Lagged GDP per capita	-0.201	-0.0471
	(0.172)	(0.232)
Lagged Rem %GDP	-0.116	0.228
	(0.163)	(0.220)
Constant	0.0299	0.0272
	(0.0334)	(0.0450)
Observations	33	33

Notes: Std errors in parentheses:*** p<0.01,** p<0.05,* p<0.1; No of Obs: 33

Table 5.10: Results of Serial Correlation on the Long-Run Causality between Remittances and GDP per capita

No of Lags	Chi2	df	Prob>Chi2
1	0.4242	4	0.98045
2	10.323	4	0.90485

Ho: No autocorrelation at lag order

The overall results fit well. Accordingly, the results in Table 5.9 indicate that the direction of long-run causality runs from remittances to GDP per capita in Rwanda. The value of β1 is 0.263** and it is significant at the 5% level. This value represents the short-run coefficient and the short-run equilibrium. This means that the system will correct its previous period disequilibrium at a speed of 26.3% between remittance percentage to GDP per capita. For the long-run equilibrium, the coefficient of the error correction term is negative (-0.240***) and it is significant at the 5% level, indicating the rate at which the system corrects the previous

period disequilibrium of the system. This implies that the system corrects its previous period disequilibrium at a speed of 24% annually. Thus, the speed of adjustment towards the long-run equilibrium state is 24% per year.

Table 5.11: Results of the Normality Test for Distribution of Residuals Using the Jarque-Bera Test

Equation	Chi2	df	Prob>Chi
D.LogGDP	241.061	2	0.00000
D.Log Rem%GDP	25.668	2	0.00000
All	266.729	4	0.00000

The results of serial correlation (see Table 5.10) on the long-run causality indicate no autocorrelation among remittances and GDP per capita. Evidently, the p-value is not significant (0.98), thus accepting the null hypothesis that there is no autocorrelation between GDP per capita and remittances. The test of normality distribution of residuals safely indicates that the residuals are normally distributed. Accordingly, Table 5.11 indicates that the p-value of the dependent values and for the overall model is significant. Therefore, the null hypothesis is rejected, confirming that the residuals of the model are normally distributed.

Overall, the empirical findings of the cross-country analysis reveal no significant effect of remittances on economic growth in the SSA region. This evidence seems to suggest that the effect of remittances on economic growth varies within and across SSA countries. The institutional variables of financial development and the country's level of development and education positively and significantly affect the remittance-growth impact across the region, while the institutional variables of political stability and regulatory qualities undermine the remittance-growth effect. Accordingly, the results suggest that the remittance-growth effect varies across and within the SSA countries, and, on average, the policy and institutional environment seem to be contributing to the moderate effect of remittances on economic growth. The policy and institutional environment are country-specific. In Rwanda, the findings clearly reveal a remittance-growth impact for the period of study in relation to the other SSA countries. The estimation techniques reveal plausible evidence of a long-run relationship between remittances and GDP per capita and the long-run causality runs from remittances to GDP per capita in Rwanda, but not vice versa. This positive and significant

effect of remittances on economic growth in Rwanda has been conditioned by the overall improvement in the economic development indicators, the effective institutional and policy framework that has conditioned mechanisms through which remittances are productively utilized to positively affect the overall improvement in the development outcomes in the country.

5.6 Conclusion

Chapter Five has examined the impact of remittance inflows on economic growth in SSA countries and Rwanda in particular between 1980 and 2014. It has examined whether this growth effect is conditional on the institutional and development factors in the region. The analytical framework of this section is embedded in the theoretical approaches of the national account model and the endogenous growth theory. The findings about the SSA region contribute to the theoretical stance of the two theories.

The findings of this chapter reveal that the two theories are complementary and not mutually exclusive in explaining the growth effect of remittances. The cross-sectional analysis of SSA countries finds no significant impact of remittances on economic growth in the SSA region. This evidence seems to imply that the effect of remittances plays out differently across and within the region. Similar findings indicate that the remittance-growth impact is positively influenced by the country's level of development, financial development and education. The more the country's level of development improves, the more institutional and policy indicators become conducive and inducing for the remittance-growth effect. However, the remittance-growth effect is adversely affected by the quality of institutional variables in the region, such as political instabilities and strict regulations. The findings also suggest that institutional and development factors play out differently within SSA countries. This has a bearing effect on the remittance-growth effect in the region and implies that the quality of institutions and the level of development variables vary across and within the region; they are country-specific.

In contrast, the remittance-growth effect in Rwanda holds. The findings reveal a positive and significant impact of remittances on economic growth in Rwanda. The marginal effect of remittances to GDP per capita increases as more remittances flow to Rwanda. Similar findings reveal plausible evidence of a long-run relationship between remittances and GDP per capita and the long-run causality runs from remittances to GDP per capita in Rwanda, but not vice versa. In relation to other SSA countries, the findings suggest a positive and significant remittance-growth impact in Rwanda but not in other SSA countries for the period

of study. This difference could be attributed to variations in terms of the level of development and the policy and institutional frameworks between Rwanda and the other SSA countries. SSA countries still register varying levels of economic performance and varying policy and institutional frameworks, which causally conditions the growth impact of remittances. In Rwanda, on the other hand, the available evidence suggests that the country has seen improvement in the development and quality of institutional variables. This improvement seems to have influenced the productive use of remittances in Rwanda, which has ultimately led to the aggregate effect – the macro impact.

The findings about the SSA countries and Rwanda in particular confirm the theoretical claims of the endogenous growth model and the national account model, arguing for the macroeconomic implications of remittances through their interactive effect with human capital development and other macroeconomic variables such as savings, financial development, GDP per capita, etc. However, the two theoretical approaches have underestimated the mediating effect of the policy and institutional framework and the context in which remittances are transferred and interact with other agents. In this regard, several empirical narratives have claimed that analyzing the role of institutional qualities in remittances and development requires contextual analysis rather than cross-national analysis. This is strongly reinforced by the findings of this chapter in the context of SSA countries and Rwanda in particular. Further in-depth country analysis is conducted to examine how remittance inflows interact with agents and the policy and institutional framework to affect development outcomes such as poverty reduction and other development outcome variables in Rwanda.

Chapter Six and Seven present data and discuss empirical strategies and results about the micro-development outcomes of remittances in Rwanda. I use Rwanda household data to examine how remittances affect poverty and other development outcomes in Rwanda and how the effect of remittances on development outcomes plays out differently among recipient households in different socio-economic categories (or quintiles) in Rwanda. Specifically, the study examines how international remittances affect poverty, but also how they affect expenditure patterns of recipient households on development outcomes such as physical investment, savings, business and human capital development in Rwanda. The study provides a prescription of how the policy and institutional framework in Rwanda causally condition remittance inflows and their productive use to ultimately affect both micro and macro development outcomes in the country.