THE EDUCATION INVESTMENT DIMENSION OF INTERNATIONAL PERSONAL REMITTANCES IN COLOMBIA

Kunofiwa Tsaurai*

Abstract

The study investigated the relationship between personal international remittances received and gross enrolment ratio in Colombia. There are three hypotheses explaining the relationship between personal international remittances and education (human capital development). These are (1) remittances-led education hypothesis, (2) education-led remittances hypothesis and (3) neutrality hypothesis that says there is no relationship at all between these two variables. Although majority of the empirical studies support the remittances-led education hypothesis, the subject is still attracting contradicting findings and not yet conclusive. It is on the backdrop of such lack of consensus in the literature that the author investigated the relationship between personal remittances received and gross enrolment ratio primary and secondary (%) in Colombia. The study used the auto-regressive distributive lag (ARDL) bounds co-integration testing technique with annual time series data ranging between 1978 and 2010 to determine the existence of a long run relationship between personal remittances and education in Colombia. The ARDL F-bounds co-integration test revealed that personal remittances received and gross enrolment ratio for both primary and secondary schools in Colombia are not co-integrated or they do not have any long run relationship, thus supporting the neutrality hypothesis. This conclusion was arrived at using either personal remittances or gross enrolment ratio as a dependent variable. These results imply that personal remittances received in Colombia were directed more towards consumption and not invested in education. The study therefore urges the Colombian authorities to concientise the recipients of the personal remittances to invest in the children's education rather than spending the remittances on consumption purposes.

Key Words: Remittances; Education; ARDL; Colombia

* *Department of Finance, Risk Management and Banking, University of South Africa, South Africa*

1. Introduction

Several studies have focused on investigating the impact of international personal remittances on human capital development. These have produced conflicting findings as some says that poor households uses remittances received for consumption purposes, alleviating poverty and reducing income inequalities in the society whilst rich families uses the remittances received for educational, housing and health investment. Other studies maintain that remittances do not have any short or long run impact on education whilst some says the impact of remittances on education varies with the age group.

The following recent empirical work gives a glimpse of the contradicting research findings on the relationship between remittances and education. Gyimah-Brempong & Asiedu (2015) studied the impact of remittances on education investment using both cross-section and pseudo-panel data in Ghana. They found out that the impact of international remittances on primary and secondary school enrolment was very high in comparison to the influence of internal remittances whilst remittances to female headed families pushed up education investment more than in male-headed families. This was buttressed by Bredl (2011) whose studies noted that remittances alleviated households' budget constraints thereby allowing more resources to be channelled towards education and health in Haiti. As expected, the positive impact of remittances on schooling was found to be stronger in poor than in rich communities in Haiti (Bredl, 2011:167).

Robles & Oropesa (2011) investigated the impact of migration and remittances on education attainment and schooling disturbance of children of migrants who remained behind in Peru using the innovative instrumental technique. Contrary to the remittance-led growth hypothesis, their study observed that despite remittance flows, immigration in general had a negative effect on the education of the children who remained behind in Peru (Robles & Oropesa, 2011:605). However, Rao (2010:142) noted that the relationship between remittances, migration,

education and socio-economic mobility is not clear cut and very difficult to link the three variables.

Bouoiyour & Miftah (2015) examined the relationship between remittances and educational levels of household members who remained in Morocco using the household survey framework. Specifically, their study investigated the possibility of the children who remained behind in Morocco to finish their school at a given normal age in comparison to those children whose parents did not migrate and therefore not sending any remittances. Their study found out that male children in remittances receiving families in Morocco had a much bigger chance of not only finishing their high school education but obtaining good passes as well (Bouoiyour & Miftah, 2015:34). According to Cristina et al (2012:4606), remittances alleviate household budget constraints and boost the disposable income that is available for both consumption and investment into education, health and housing.

It is clear from these contradictions in literature that the relationship between international personal remittances and education is still inconclusive. Such contradictions motivated the author to investigate the relationship between the two variables in Colombia, which is one of the emerging economies whose international personal remittances have been on the rise for the past two decades. The author examine whether or not international remittances inflow had an impact on the enrolment in primary and secondary schools in Colombia during the period from 1978 to 2010 using the autoregressive distributive lag (ARDL) framework. To achieve this objective, the study uses personal remittances received as a ratio of GDP and gross enrolment ratio primary and secondary (%) as proxies of international remittances and schooling enrolment respectively. This study did not consider not only the gender dimension and age sizes but the impact of personal remittances on schooling attendance and attainment as well. This can be a subject of another research aimed at gaining a much better insight into the influence of personal international remittances on education investment in Colombia.

The study consists of five sections. The first section reviews literature on remittances and human capital development focusing more specifically on the education aspect. The second section discusses the trends of the personal remittances and gross enrolment ratio for primary and secondary schools during the period from 1978 to 2010. The third section deals with the data description, data sources, methodological framework, data analysis and findings. The fourth section provides a conclusion whilst the fifth section shows a list of references.

2. Review of Related Literature

Using the propensity score matching approach, Mueller & Shariff (2011) investigated the causality between migrants from internal migrants and human capital investment in the rural areas of India. Their study found out that the remittances positively influenced the school attendance rates of the teenagers in India. The positive impact of remittances on (1) male schooling attendance and (2) in poor households was significant in India (Mueller & Shariff, 2011:214).

On the contrary, Acosta (2011) found out that girls' school attendance rate increased as compared to boys' school attendance rate in direct response to inflow of remittances at household level in El Salvador. The study observed that remittances had a negative impact on secondary school rate of attendance thus showing some glimpse of how households in El Salvador allocate remittance resources. Overally, Acosta (2011) noted that remittances had a negligible positive influence on schooling in El Salvador.

McKenzie & Rapport (2011) investigated whether migration and remittances can influence educational attainment in Mexico. Their study noted that migration and remittances had a significant negative impact on schooling attendance and accomplishment in Mexico. Specifically, migration and remittances was found to have lowered down the probability of boys and girls children who either remained behind or migrated with parents to successfully finishing their high school in Mexico. This was buttressed by Richard & Adams (2011) whose studies observed that remittances had a negative impact on education, growth of the economy and labour supply whilst on the other hand lowering the poverty levels and improving the health standards in developing countries.

Mansour et al (2011) studied the impact of remittances on human capital development among the youths from Jordan using a survey approach. Controlling for other factors that has an influence on education attendance rate, remittances were found to have had a significant positive impact on education attendance in Jordan. Moreover, their study revealed a higher positive impact of remittances on education attendance among women as compared to men. Edwards & Ureta (2003) studied the influence of remittances on schooling decisions in El Salvador using the Cox proportional hazard model. Their study showed that remittances had a significant positive influence on school retention or lowering school drop outs. Moreover, they found out that the positive impact of remittances on the schooling of children learning in rural areas was much more as compared to in the urban areas, thus supporting the remittances-led education hypothesis.

Zhunio et al (2012) investigated the impact of remittances on education and health sector in the low

and middle income countries using unbalanced panel data analysis from 1987 to 2006. Their study showed that remittances had a more positive influence on secondary school enrolment than primary school enrolment, a level in which education is compulsory thereby less likely to be affected by other variables. Furthermore, remittances managed to improve the infant mortality rate and life expectancy (Zhunio et al, 2012:4610). However, Docquier et al (2012) observed that remittances had a more positive influence on education in the receiving country if the immigration policy in the destination country is restrictive and vice-versa.

Amuedo-Dorantes et al (2010) investigated the impact of remittances on children's schooling in Haiti and found out that remittances reduced the negative disruptive impact of household out-migration on children's schooling apart from increasing the school enrolment and attendance in Haiti. According to a study by Bollard et al (2011), it is the levels of education among the emigrants that determines the quantity of remittances send back to the home country. Their study found out that highly educated emigrants are likely to remit more as they are more likely to be earning higher as compared to less educated emigrants, thereby supporting the education-led remittances hypothesis.

Adams & Cuecuecha (2010) found out that households spend more remittances they received on education and housing investments in comparison to the portion of remittances directed at consumption expenditure such as food. Yao (2007) investigated the influence of remittances on children's education among blacks in South Africa using cross sectional and panel data from 1993 to 1994. The study revealed that not only do remittances increased the number of black children going to school but also significantly reduced gender inequalities in the access to education in South Africa.

Acosta (2007) explored the impact of remittances on education, health and poverty in 11 Latin American countries using the household survey approach. Remittances were found to have had a strong positive impact on education and health whilst the impact on poverty reduction was observed to be modest across all the 11 Latin American countries. Furthermore, Chaaban & Mansour (2012) studied the influence of remittances on education enrolment, attendance and attainment in Jordan, Syria and Lebanon using household survey approach. Controlling for all other factors that influence schooling behavior and performance, they observed that (1) remittances impacted positively on school attendance across all the three countries that were under study, (2) the positive influence of remittances on schooling enrolment, attendance and attainment for boys was much higher in comparison to that of girls in Jordan and Syria. On the contrary, Lebanon was characterized by lower schooling enrolment, attendance and attainment for both boys and girls in comparison to its counterparts (Chaaban & Mansour, 2012:13).

Using a household survey approach, Hu (2012) noted that remittances managed to partially compensate the negative effects (school attendance and attainment) arising from absence of parents on children in the rural areas of China. The rural girls of China were the most affected by the absence of their migrant parents as remittances could not offset all the negative schooling behavior (Hu, 2012:409). The same study also revealed that mothers' level of education, the number of siblings in the family and wealth level of the family were also significant factors that determined the schooling attendance rates in the rural areas of China.

Cattaneo (2012) investigated the relationship between remittances and educational expenditure in Albania using a combination of the Engel curve framework and regression analysis. Contrary to most empirical findings on this topic, Cattaneo (2012) noted that remittances had no impact at all on the education expenditure in Albania which suggests that the money could be directed towards consumption expenditure instead. Low education infrastructure in Albania schools was found to be one of the factors that worked against remittance-inspired educational investment (Cattaneo, 2012:188).

Using the random effect Logit model and descriptive statistics, Treiman (2011) investigated the impact of migration and remittances on education stratification among blacks in apartheid and post-apartheid South Africa. The results from the study ae fourfold: (1) remittances ameliorated the socio-economic inequalities in South Africa schools during and post-apartheid, (2) the equalizing effects of remittances continued during and after apartheid era, (3) remittances had a significant positive impact on black children school enrolment, attendance and attainment, a trend that did not apply among the white community in South Africa during and post-apartheid and (4) remittances managed to cushion the negative impact on black children's schooling which arose due to lack of timely parental input.

Mara et al (2012) studied the impact of remittances on education and health of family left behind in Albania and Macedonia. Their study revealed that remittance had a significant positive influence on education and health in Albania and Macedonia. In the short run, remittances were found to have been more directed towards consumption, reducing income inequality and poverty levels whilst in the long run, remittances significantly successfully contributed towards health and education improvement programmes.

Acharya & Leon-Gonzalez (2014) investigated whether migration and remittances influence human capital development through easing liquidity constraints in Nepal using longitudinal data from a balanced panel of 962 households. The findings are fourfold: (1) remittances enabled the liquidity

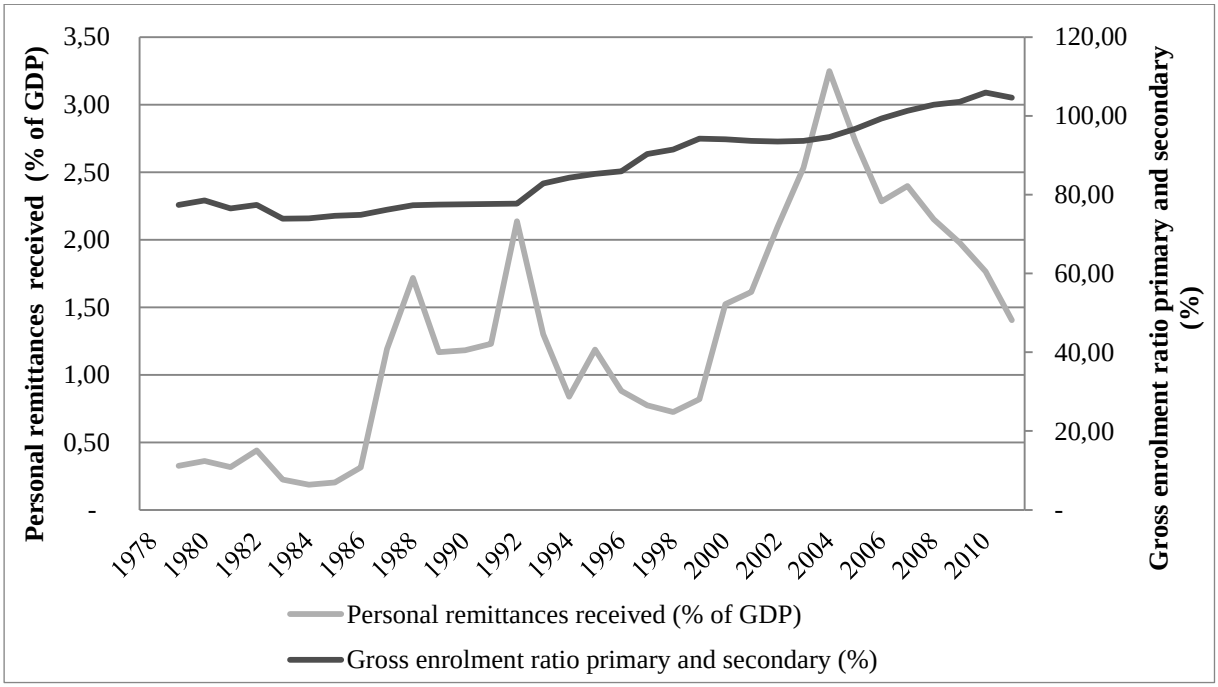
constrained poor families to enroll their children in schools and lower the dropout rates, (2) the remittances enabled the less liquidity constrained households to increase their investment in high quality education, (3) despite benefiting from remittance inflows, children whose migrant parents are more educated and well informed are more academically disadvantaged by the absence of their parents whilst (4) children whose migrant parents are less educated and not well informed were found to have academically benefited more from remittances inflows.

3. Personal remittances and gross enrolment ratio (primary and secondary) in Colombia.

Personal remittances received (% of GDP) by Colombia went down by 0.01 percentage points, from 0.33% in 1978 to 0.32% in 1980 whilst gross enrolment ratio primary and secondary (%) plummeted by 0.89 percentage points during the same time frame (World Bank, 2014 statistics).

The subsequent five year period saw personal remittances received (% of GDP) remaining stagnant whilst gross enrolment ratio primary and secondary (%) declined by 1.61 percentage points, from 76.48% in 1980 to 74.87% in 1985. However, both personal remittances received as a ratio of GDP and gross enrolment ratio primary and secondary (%) went up by 0.91 and 2.74 percentage points respectively during the five year period from 1985 to 1990 (see Figure 1).

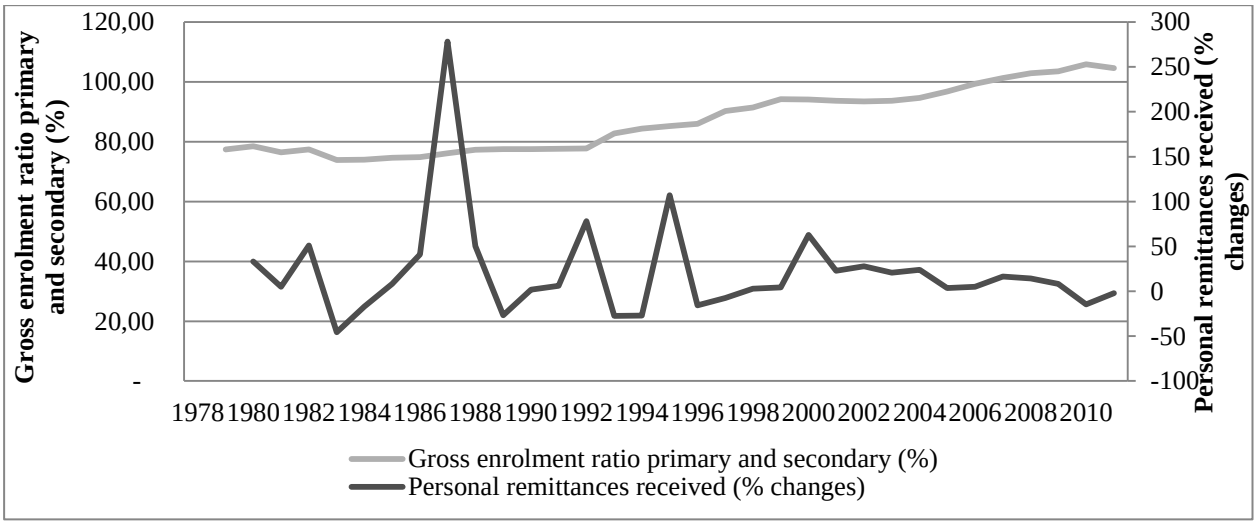
Figure 1. Personal remittances received (% of GDP) and Gross enrolment ratio primary and secondary (%) for Colombia (1978 -2010)



Source: World Bank (2014)

Furthermore, personal remittances received as a ratio of GDP declined by 0.35 percentage points, from 1.23% in 1990 to 0.88% in 1995 before a 0.73 percentage points rebound during the subsequent five year period to end the year 2000 at 1.61%. On the other hand, gross enrolment ratio primary and secondary (%) gained by 8.36 percentage points, from 77.61% in 1990 to 85.97% in 1995 before registering another positive growth of 7.72 percentage points (from 85.97% in 1995 to 93.68% in 2000).

Figure 2. Gross enrolment ratio primary and secondary (%) and personal remittances received (% of GDP) for Colombia (1978 -2010)



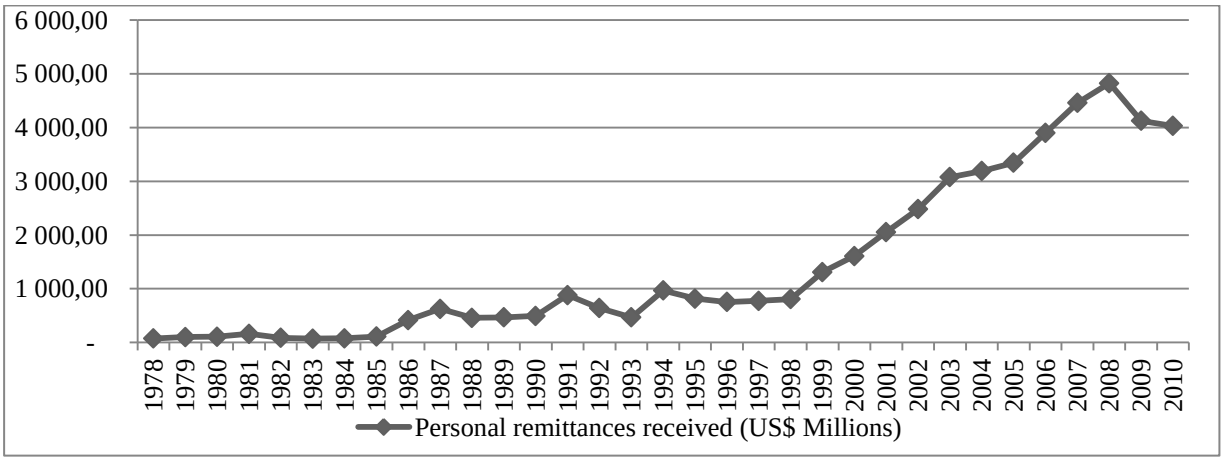
Source: World Bank (2014)

Personal remittances received as a ratio of GDP and gross enrolment ratio primary and secondary (%) increased by 0.67 and 5.69 percentage points respectively during the five year period between 2000 and 2005. The personal remittances received as a ratio of GDP went up from 1.61% in 2000 to 2.28% in 2005 whilst gross enrolment ratio primary and secondary (%) increased from 93.68% in 2000 to 99.38% in 2005. Last but not least, the period between 2005 and 2010 saw personal remittances received as a ratio of GDP nose-diving by 0.88 percentage points, from 2.28% in 2005 to 1.40% in 2010 whilst gross enrolment ratio primary and secondary (%) experienced a positive growth of 5.21 percentage points, from 99.38% in 2005 to 104.59% in 2010.

The personal remittances received by Colombia went up from US$75.820 million in 1978 to US$106 million in 1980, representing an increase by 39.80% before marginally going up again by 3.77% to end the year 1985 at US$110 million. The subsequent five year period saw personal remittances received by Colombia massively increasing by 350% to end the year 1990 at US$495 million. Furthermore, personal remittances received by Colombia registered another positive 64.67% growth, from US$495 million in 1990 to US$815.118 million in 1995 before going up by 97.53% during the subsequent five year period to end year 2000 at US$1 610 million.

On the other hand, personal remittances into Colombia significantly went up by 107.79% between 2000 and 2005 to end the period at US$3 346 million before experiencing another 20.48% growth during the subsequent five year period to end the year 2010 at US$4 030.85 million.

Figure 3. Personal remittances received (US$ Millions) in Colombia



Source: World Bank (2014)

4. Methodological Approach

Data Sources and Proxies

The study used annual time series data from 1978 to 2010 extracted the World Bank (2014) World Development Indicators. Personal remittances received as a ratio of GDP and gross enrolment ratio primary and secondary (%) were used as a measure of personal remittances and gross enrolment ratio respectively. The choice of the proxies was informed by the literature.

Unit root tests

Using Augmented Dickey Fuller (ADF), Philips-Perron (PP) tests and the Dick-Fuller GLS, personal remittances and enrolment data was non-stationary at level at both % and 5% significance levels (refer to Table 1).

Table 1. Stationarity Tests of Variables in Levels

Variable	Test Statistic – Trend &Intercept	Critical Values	
Stationarity Tests of Variables on levels - Augmented Dickey-Fuller - Test			
PREMITTANCES	-1.904522	-4.273277*	-3.557759**
ENROLMENT	-2.545941	-4.273277*	-3.557759**
Stationarity Tests of Variables on levels – Phillips-Perron (PP) Test			
PREMITTANCES	-2.080311	-4.273277*	-3.557759**
ENROLMENT	-2.581742	-4.273277*	-3.557759**
Stationarity Tests of Variables on levels – Dickey-Fuller GLS (ERS) Test			
PREMITTANCES	-2.103522	-3.770000*	-3.190000**
ENROLMENT	-1.827358	-3.770000*	-3.190000**

Note:
1) * and ** denote 1% and 5% levels of significance, respectively.
2) * MacKinnon critical values for rejection of hypothesis of a unit root.
3) The truncation lag for the PP tests is based on Newey and West (1987) bandwidth.

However, both enrolment and personal remittances data became stationary at first difference (see Table 2).

Table 2. Stationarity Tests of Variables on first Difference

Variable	Test Statistic – Trend &Intercept	Critical Values	
Stationarity Tests of Variables on first Difference - Augmented Dickey-Fuller - Test			
D(PREMITTANCES)	-5.567352	-4.323979*	-3.580623**
D(ENROLMENT)	-10.20719	-4.296729*	-3.568379**
Stationarity Tests of Variables on first Difference – Phillips-Perron (PP) Test			
D(PREMITTANCES)	-20.64582	-4.296729*	-3.568379**
D(ENROLMENT)	-31.86129	-4.296729*	-3.568379**
Stationarity Tests of Variables on levels – Dickey-Fuller GLS (ERS) Test			
D(PREMITTANCES)	-5.742926	-3.770000*	-3.190000**
D(ENROLMENT)	-9.214115	-3.770000*	-3.190000**

Note:
1) * and ** denote 1% and 5% levels of significance, respectively.
2) * MacKinnon critical values for rejection of hypothesis of a unit root.
3) The truncation lag for the PP tests is based on Newey and West (1987) bandwidth.
4) Critical values for Dickey-Fuller GLS test are based on Elliot-Rothenberg-Stock (1996, Table 1).

The variables are integrated of order 1. Since none of the variables are integrated of order 2, it is possible to examine the relationship between personal remittances and gross enrolment ratio in Colombia using the ARDL model.

Co-integration Test

Just like as in Odhiambo (2009), the current study employed the auto-regressive distributive lag (ARDL) approach to examine the existence of a long run relationship between personal remittances and gross enrolment ratio in primary and secondary education in Colombia. The following equations (i and ii) expresses the ARDL co-integration testing framework.

$$\Delta InREMIT_t = a_0 + \sum_{i=1}^{n} a_{1i}\Delta InREMIT_{t-i} + \sum_{i=0}^{n} a_{2i}\Delta InENROL_{t-i} + a_3 InREMIT_{t-1} + a_4 InENROL_{t-1} + \mu_t \quad (1)$$

$$\Delta InENROL_t = \beta_0 + \sum_{i=1}^{n} \beta_{1i}\Delta InENROL_{t-i} + \sum_{i=0}^{n} \beta_{2i} InREMIT_{t-i} + \beta_3 InREMIT_{t-1} + \beta_{4i} InENROL_{t-1} + \mu_t \quad (2)$$

Where: Δ = first difference operator; In REMIT = Log of value of personal remittances as a ratio of GDP; In ENROL = Log of gross enrolment ratio primary and secondary (%).

The next stage involved the estimation of the order of lags or the optimum lag length on the first differenced variables in equations (i) and (ii) using the Schwartz-Bayesian Criterion (SC) and Akaike Information Criterion (AIC) – see Table 3 for results.

Table 3. Determination of the lag length

Lag	AIC	SC
4	1.664046	2.234991
3	1.639518	2.110999
2	1.483466	1.857118
1	1.327628	1.605174

The optimal lag of both personal remittances and gross enrolment ratio using AIC and SC is 1 because it has the lowest AIC and SC criteria (see Table 3). The equations (i) and (ii) are more robust because of the shorter lag length. The model with lag length of 1 was also found to be stable and without any serial correlation.

The next stage involved applying the F- bounds co-integration test to the equations (i) and (ii) in order to determine the existence of the co-integration relationship between personal remittances and gross enrolment ratio (see Table 4).

Table 4. Bounds F-Test Results

Dependent variable	Function		F-test statistic			
REMIT	REMIT(ENROL)		1.032543			
ENROL	ENROL(REMIT)		1.535994			
Asymptotic Critical Values						
	1 %		5%		10%	
	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
Pesaran et al. (2001), p. 300, Table CI(iii) Case 111	6.84	7.84	4.94	5.73	4.04	4.78

The study shows that there exists no co-integrating equation between personal remittances and gross enrolment ratio in Colombia. This is because the F-statistic in both the remittances and the enrolment equations in Table 4 is lower than the asymptotic critical values at 1%, 5% and 10% levels of significance. We cannot therefore reject the null hypothesis that says personal remittances and gross enrolment ratio jointly are equal to zero. In other words, the two variables do not have a long run relationship.

5. Conclusion

The study investigated the relationship between personal international remittances received and gross enrolment ratio in Colombia using the ARDL framework with annual time series data ranging between 1978 and 2010. There are three hypotheses explaining the relationship between personal international remittances and education (human capital development). These are (1) remittances-led education hypothesis, (2) education-led remittances hypothesis and (3) neutrality hypothesis that says there is no relationship at all between these two

variables. Although majority of the empirical studies support the remittances-led education hypothesis, the subject is still attracting contradicting findings and not yet conclusive. It is on the backdrop of such lack of consensus in the literature that the author investigated the relationship between personal remittances received and gross enrolment ratio primary and secondary (%) in Colombia. The ARDL F-bounds co-integration test revealed that personal remittances received and gross enrolment ratio for both primary and secondary schools in Colombia are not co-integrated or they do not have any long run relationship, thus supporting the neutrality hypothesis. This conclusion was arrived at using either personal remittances or gross enrolment ratio as a dependent variable. These results imply that personal remittances received in Colombia were directed more towards consumption and not invested in education. The study therefore urges the Colombian authorities to concientise the recipients of the personal remittances to invest in the children's education rather than spending the remittances on consumption purposes.

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