

The Impact of Remittances on Human Capital in Sub-Saharan Countries

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Abstract: This study has examined the impact of remittances on human capital based on 23 Sub-Saharan countries (SSA) from 1981 to 2010. Our primary contribution lies in demonstrating that remittances have a positive impact on the enhancement of human capital in these SSA countries. The results indicate that a 1 percent increase in remittances leads to a 0.26 percent rise in the average years of schooling. To ensure the credibility of our findings, we employ a Generalized Method of Moments (GMM) approach to control for the endogeneity of remittances and human capital in our empirical analysis.

Keywords: *Remittances, human capital, developing countries*

1. Introduction and Background

Worker's remittances to developing countries have experienced significant growth in the past two decades and now stand as the second largest external source of income after Foreign Direct Investment (FDI) in these countries (Hubert Ebeke, 2012). The Sub-Saharan African countries, in particular, have witnessed a surge in remittance flows since the early 2000s, with the share of remittances in SSA rising from 3.78 percent to 8.74 percent in 2014, making remittances a more stable funding source compared to traditional channels like FDI and Official Development Assistance (ODA), especially during economic and financial crises (World Bank, 2013).

The impact of remittances on human capital is complex and can be influenced by two distinct relationships (Zhunio et al., 2012; Ngoma & Ismail, 2013). The first relationship indicates that education plays a significant role in determining both remittances and migration patterns. A person's educational attainment level can influence their decision to migrate, and remittances are, in turn, influenced by the educational background of the migrants. On the other hand, the second relationship suggests that education can be driven by remittances. In other words, remittances can have a positive effect on a person's educational level if they are utilized to invest in education, enabling individuals to access better educational opportunities and allowing children to complete more years of schooling.

The existing evidence on the effect of remittances on human capital accumulation is generally inconclusive and, in some cases, seems to contradict the results from other countries. Numerous studies (Adams, 2011; Zhunio et al., 2012; Ngoma & Ismail, 2013; Huay et al., 2019) have found that remittances contribute to increased household income, particularly benefiting poor households by overcoming budget constraints. This, in turn, encourages receiving households to invest more in education. Conversely, some studies suggest the presence of a negative effect of remittances on human capital. The receipt of remittances can disrupt family life, potentially leading to adverse consequences on the educational attainment of children. These conflicting findings make the effect of migrant remittances on human capital investment theoretically ambiguous (Kugler, 2006). In summary, while some research highlights the positive impact of remittances on education through increased household income, other studies emphasize the potential negative effects due to disruptions in family dynamics. As a result, the overall effect of remittances on human capital investment remains uncertain and context-dependent.

Moreover, human capital is one of the crucial goals among the Millennium Development Goals (MDGs). The importance of human capital has been often emphasized in both theoretical and empirical literature. Along these lines, an enormous amount of theoretical and empirical research has been conducted to explore whether human capital can contribute to the development of countries through the knowledge and skills of people. There is evidence indicating that remittances impact living standards and human welfare. Evidence from the globe shows that households that receive remittances are financially better off compared to

households that do not receive them (Gupta et al. 2009). Higher total income can boost investment and consumption which will lead to an increase in human capital. If the disposable income for consumption and investment is increased, it can increase a household's ability to pay for health and education (Zhunio et al, 2012). Thus in this regard, it is important to understand the impact of remittances on outcomes related to human capital accumulation.

Meanwhile, the effect of remittances on human capital is not straightforward. The influence of remittances on the human capital channel is affected by two kinds of relationships (Zhunio et al 2012, Ngoma & Ismail, 2013). The first relationship shows education as a determinant of remittances and migration. A person's education level influences their decision to migrate and remittances are affected by the level of education. The second describes education is driven by remittances. In other words, remittances affect a person's educational level if they are used to buy education and allow children to complete more schooling.

The existing evidence on the effect of remittances on human capital accumulation is generally inconclusive and, in some cases, seems to contradict the results from other countries. Various studies have found that remittances lead to a rise in income which benefits poor households and overcome budget constraint. Hence, it encourages receiving households to invest in education. On the other hand, other studies tend to suggest the presence of a negative effect of remittances on human capital. The receipt of remittances can have disruptive effects on family life, with potentially negative consequences on the educational attainment of children. Other studies thus in this regard, the effect on human capital investment of migrant remittances are theoretically ambiguous (Kugler, 2006).

While increased remittance inflows can have a positive impact on economic growth and development in recipient countries, the effects of remittances on other welfare aspects, such as poverty and human capital, are still subject to ongoing discussions. The existing literature lacks a consensus and provides limited information regarding the relationship between remittances and human capital (Acosta et al., 2007).

Given the limited research on the link between remittances and human capital in Sub-Saharan African (SSA) countries, this study aims to contribute to the emerging literature by analyzing the impact of remittances on human capital in developing nations. The paper's structure is organized as follows, section 2 provides a concise review of the existing literature on remittances and human capital, section 3 outlines the data sources used and briefly explains the methodology employed in this study and section 4 presents the empirical results of the analysis. Finally, section 5 concludes the paper by summarizing the findings and discussing their potential policy implications.

2. Literature Review

Remittances, as defined by Adams (2011), refer to both money and goods transmitted to households by migrant workers. They serve as a significant indicator of the impact migrant workers has on their home countries (Orozco, 2003). The existing literature on the relationship between remittances and education yields mixed and inconclusive results. The majority of studies suggest a positive effect of remittances on the migrant-sending country (Salas, 2014; Arguillas and Williams, 2010; Acosta et al., 2007). For example, Mansour et al. (2011) conducted a study using the 3006 Jordanian household expenditure and income survey and found that remittance inflows increase the likelihood of males aged 18-24 attending schools, but this effect is not observed among females. Similarly, Ngoma and Ismail (2013) utilized the system GMM approach to examine the effect of remittances on human capital in 89 developing countries. Their estimation results revealed that an increase in migrant remittances leads to an increase in the number of years of schooling at the secondary and tertiary levels. On average, remittances were found to increase the average years of secondary and tertiary schooling by 2 percent. In summary, remittances have a notable impact on education in migrant-sending countries, with several studies suggesting a positive relationship between remittances and human capital development.

Empirical evidence on country-specific studies also yields similar results (Huay & Bani, 2018). In the case of Mexico, Córdova (2006) found that remittances can increase children's school attendance. A 1 percent increase in the fraction of households receiving remittances was associated with a nearly 3 percent reduction

in child illiteracy and increased school attendance for children aged between 6 and 14 years old. In the case of El Salvador, Edwards and Ureta (2003) highlighted a significant impact of remittances on school retention even after controlling for factors like parental schooling, gender, income, and access to basic services. They used the Cox proportional hazard model in a cross-section of 14,286 individuals aged 6-24 and concluded that remittances have a substantial effect on school retention. In the Philippines, Arguillas and Williams (2010) proposed a positive effect of migration on the years of schooling, indicating that remittances have a beneficial impact on educational outcomes. Overall, these country-specific studies contribute further support to the notion that remittances positively influence educational outcomes, promoting school attendance, retention, and investment in education in migrant-sending countries.

On the other hand, a number of studies have found a negative relationship between remittances and education. McKenzie and Rapoport (2006) find a negative relationship between emigration and school attendance. They discovered that remittances have no significant impact on school attendance of 12 to 15 years old and a negative and significant impact of migration on schooling level of 16 to 18 years old. Then again, McKenzie and Rapoport (2011) conclude remittances have a negative impact on the investment in education because of the absence of adults to provide supervisory at home for children's education. The view is supported by Boucher et al (2009), who suggest a negative, statistically insignificant relationship between schooling and migration. Similarly, Frisancho-Robles and Oropesa (2011) use Peruvian data from the Latin American Migration Project (LAMP) which provides information on 4,451 individuals in 822 households as evidence that a higher risk of migration leads to harmful effects on education for children. This is supported by Nguyen and Nguyen (2015), who show that there is no statistically significant effect of remittance inflows on school enrolment in Vietnam. Also, Adams and Cuecuecha (2013) conclude that households in Ghana do not spend disproportionately on remittance income on education and other products. However, this is in contrast to the recent study by Gyimah-Brempong and Asiedu (2014), who show that remittances have significant and positive effects on the education of children, it increases the probability that families enroll their children in primary and secondary schools in Ghana.

3. Research Methodology

This paper will investigate the dynamic relationship between remittances and human capital in Sub-Saharan Africa. We use a panel data approach using an unbalanced panel of 23 SSA countries spanning from 1980 to 2010. These countries and time span were selected because it was possible to find the relevant remittances and human capital data since the year 1981. Due to the nature of the human capital data, which is measured at five-year intervals, all variables in the analysis are also measured at five-year intervals, corresponding to the respective survey year.

To estimate the impact of remittances on human capital, the basic econometric specification is as follows:

$$HC_{it} = \alpha_i + \beta_1(HC)_{it-1} + \beta_2REM_{it} + \beta_3(X)_{it} + \mu_i + \gamma_t + \varepsilon_{it}$$

Where the dependent variable, HC is the human capital in country i at time t ; HDI_{it-1} represents the lagged value of the dependent variable and REM_{it} represent the remittances in country i at time t , and X represents control variables (population, GDP, and financial development). μ_i is country fixed effect, γ_t is the year-fixed effect and ε_{it} is the error term. The coefficients α , β_2 , β_3 denote the parameter to be estimated.

The secured financial system can promote economic growth, which in turn increases human development. In this regard, we use Private credit by deposit money banks to GDP (%) as the proxy for financial development. Economic growth is identified as an important control variable in human capital (Ramey and Ramey, 1995). Theoretically, the economic growth rate affects human capital positively (Solow, 1956). We also include population growth as one of the factors that increase human capital in a country. The data for this analysis come from different sources. Data on human capital are sourced from the Barro and Lee dataset, which provides estimates on the total average years of schooling for individuals aged 25 and above in five-year interval. Data on the remaining variables (remittances, GDP per capita, private credit and population) were obtained using the World Bank's *World Development Indicators*.

In this study, we adopt a multi-faceted approach to estimate the relationship between remittances and human capital in Sub-Saharan Africa. We begin with pooled Ordinary Least Squares (OLS), random effects, and fixed effects estimations. These methods allow us to explore different aspects of the relationship across countries and time periods.

Pooled Ordinary Least Squares (OLS) combines data from various countries and time points into a single regression. However, it may overlook the heterogeneity present in different countries and periods. The random effects model accounts for country-specific intercepts and treats unobserved effects as random and unrelated to the explanatory variables. It helps capture individual country differences but assumes that the effects are independent of the explanatory variables. In contrast, the fixed effects model controls for time-invariant country-specific effects by introducing country-specific dummy variables. While it captures time-invariant heterogeneity, it may not account for time-varying factors.

Subsequently, we employ dynamic System GMM to complement the previous estimations. This powerful technique addresses endogeneity, time-varying heterogeneity, and unobserved country-specific effects. By using lagged variables as instruments, it provides more reliable and efficient estimates. By combining these diverse estimation methods, we aim to present a comprehensive and robust analysis of the relationship between remittances and human capital in Sub-Saharan Africa. This approach allows us to identify patterns and validate the findings, providing valuable insights into the dynamics of remittances' impact on human capital in the region.

The system GMM estimation technique would be an ideal method because this estimator corrects for country-specific effects and the possibility of endogeneity of some explanatory variables. Thus in this regard, our analysis will be drawn from the system GMM estimates on the relationship between remittances and human capital because System GMM improves efficiency compared to first-differenced GMM and is able to handle unobserved country-specific effect, endogeneity issues that may be present in the estimation. This will provide insight into the dynamic relationship between remittances and human capital in Sub-Saharan Africa and contribute to the existing literature on the topic.

4. Results

Table 1 presents the estimation results. The estimations meet our prior expectations, showing the expected results on all variables. The coefficient on the lagged human capital variable is significant and has the expected positive sign, indicating that past human capital positively influences current human capital. The coefficient for the variable of interest, remittances, is positive and statistically significant, supporting the notion that remittances have a favorable effect on human capital. Specifically, a 1 percent increase in remittances corresponds to approximately a 0.27 percent increase in human capital. These findings are in line with the studies conducted by Koska et al. (2013) and Acosta et al. (2007), where they also found evidence of remittances contributing to the improvement of human capital.

As far as the additional variables are concerned, growth, financial development, and population are highly significant with the positive sign. Firstly, economic growth has a positive and statistically significant impact on human capital. A higher rate of growth is associated with increased achievements in human capital, indicating that economic prosperity can foster educational and skill development. Secondly, our findings are consistent with existing literature, demonstrating that financial development plays a crucial role in facilitating human capital. A well-developed financial market, as measured by financial indicators, leads to a slight but significant increase in human capital by 0.001 percentage points. Lastly, the population size also exerts a positive and statistically significant influence on human capital. A larger population is associated with higher levels of human capital, with each percentage-point increase in population leading to a 0.033-point increase in human capital.

In summary, our study reinforces the importance of economic growth, financial development, and population size in driving human capital formation. These findings highlight the significance of policies that promote economic growth, foster financial development, and account for population dynamics as crucial factors in enhancing human capital, which, in turn, contribute to the overall progress and development of a country or

region.

The reliability of the Generalized Method of Moments (GMM) estimator is contingent upon two essential specification tests, which also serve as assessments of instrument validity. In our analysis, we include two specification tests to address these concerns. The first specification test is the Sargan test of over-identifying restrictions. This test assesses whether the chosen instruments are valid and whether the number of instruments matches the number of identifying restrictions in the model. The satisfactory outcome of this test indicates that the instrumental variables used in the estimation are appropriate and well-suited for the model.

The second specification test we employ is the Arellano-Bond test for autocorrelation. This test aims to detect potential autocorrelation or serial correlation in the model. Autocorrelation occurs when the error terms in the model are correlated over time, potentially leading to biased estimates. However, the absence of misspecification problems revealed by this test implies that the model is appropriately specified and that autocorrelation is not a major concern in our analysis.

Overall, the results from both specification tests affirm the validity and reliability of the chosen instrumental variables, as well as the appropriateness of the model specification. This ensures that our GMM estimator provides accurate and consistent estimates of the relationships between remittances and human capital, and other factors in our analysis. The satisfactory diagnostics further validate the robustness of our findings.

Table 1: The Impact of Remittances on Human Capital: GMM Estimation

Variables	Education
Education _{t-1}	0.2677*** (0.0098)
Remittances	0.0137*** (0.0005)
GDP	0.0004*** (4.4800)
Population	0.033*** (0.006)
Financial Development	0.0095*** (0.0010)
AR Test (2)	0.4532
Sargan Test	0.5348

Note: Standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Discussion: Table 1 presents the estimation results. The estimations meet our prior expectations, showing the expected results on all variables. The coefficient on the lagged human capital is significant with the expected positive sign. The coefficients of the variables of interests and remittances are positive and significant. These findings suggest that remittances tend to have positive and statistically effects on human capital. An increase in remittances leads to about a 0.27 percent increase in human capital. This finding is consistent with Koska et al. (2013) and Acosta et al. (2007), where they reveal evidence that remittance can improve human capital.

As far as the additional variables are concerned, growth, financial development, and population are highly significant with the positive sign. Growth has a positive and significant impact on human capital. The positive coefficient indicates that the greater growth, the higher the achievement in human capital. Consistent with previous literature, we also find that financial development facilitates human capital. A good financial market in financial measures will increase human capital by 0.001 percentage points. Finally, the result of the population size is obtained as per our expectations. Greater population size indicates a higher level of human capital. The coefficient is positive and statistically significant. The human capital will increase by 0.033 points with an increase of one percentage point in population.

The consistency of the generalized method of moment estimator depends on two specification tests which are

also the test of validity of the instruments. We present two specification tests to address these issues. The first is the Sargan test of over-identifying restrictions. The second is the Arellano-Bond test for autocorrelation. All the diagnostics are satisfactory. In all cases, the validity of the chosen instrumental variables is confirmed by the Sargan test and second-order serial correlation tests do not reveal a misspecification problem.

5. Conclusion and Recommendations

The present study investigated the impact of remittances on humans in SSA countries. Several important conclusions can be drawn from the estimation. First, the analysis shows that all the variables of interest provided expected signs, thus, consistent with the previous literature that remittance is very helpful to human capital improvement. The positive relationship between remittances and human capital has been empirically supported by Zhunio et al. (2012), Bertoli and Cagnetti (2006), Rapoport and Docquier (2005). We also find the effect of other variables on human capital in the study. Higher GDP is capable of increasing human capital, which is consistent with the previous literature (Hanushek, 2013). On the other hand, higher financial development is related to the increase of human capital; a better financial market is expected to improve human capital.

Sustaining and improving human capital in a country requires a comprehensive approach that goes beyond the sole focus on remittances. While remittances can play a vital role in supporting education and skill development, implementing a set of appropriate and complementary policies is essential to maximize the impact on human capital. For example, a comprehensive policy framework encompassing education, healthcare, labor market reforms, research and development, social protection, gender equality, infrastructure, governance, financial inclusion, and environmental sustainability is essential for sustained and improved human capital growth. Governments should actively implement policies that promote the use of remittances to enhance human capital. Currently, high transaction costs and transfer charges discourage workers from remitting money to their labor-exporting countries, leading to financial hardships for their families with each remittance transaction. The high transaction costs are often a result of insufficient regulation and lack of competition in the remittance market. To address these challenges, governments can introduce measures aimed at reducing remittance transaction costs and encouraging formal financial channels for remittances.

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References

- Acosta, P., Fajnzylber, P., & Lopez, J. H. H. (2007). The Impact of Remittances on Poverty and Human Capital: Evidence from Latin American Household Surveys. *World Bank Policy Research Working Paper*, 4247, 1–36
- Adams, R. H. (2011). Evaluating the Economic Impact of International Remittances on Developing Countries Using Household Surveys: A Literature Review. *Journal of Development Studies*, 47(6), 809–828.
- Adams, R. H., & Cuecuecha, A. (2013). The Impact of Remittances on Investment and Poverty in Ghana. *World Development*, 50, 24–40.
- Arguillas, M. J. B., & Williams, L. (2010). The impact of parents' overseas employment on educational outcomes of Filipino children. *International Migration Review*, 44(2), 300–319.
- Bertoli, S., & Cagnetti, E. S. (2006). Working Paper Series Remittances and the Dynamics of Human Capital in the Recipient Country Remittances and the Dynamics of Human Capital, (7).
- Boucher, S., Stark, O., & Taylor, J. E. (2009). A gain with a drain? Evidence from rural Mexico on the new economics of the brain drain.
- Córdova, J. E. L. (2006). Globalization, migration and development: the role of Mexican migrant remittances (Working Paper ITD= Documento de Trabajo ITD; n. 20) (Vol. 20). BID-INTAL.
- Edwards, A.C. and Ureta, M. (2003), "International migration, remittances, and schooling: evidence from El

- Salvador", *Journal of Development Economics*, Vol. 72 No. 2, pp. 429-61.
- Frisancho-Robles, V. F., & Oropesa, R. S. (2011). International Migration and the Education of Children: Evidence from Lima, Peru. *Population Research and Policy Review*, 30(4), 591–618.
- Gupta, S., Pattillo, C. A., & Wagh, S. (2009). Effect of remittances on poverty and financial development in Sub-Saharan Africa. *World Development*, 37(1), 104-115.
- Gyimah-Brempong, K., & Asiedu, E. (2014). Remittances and investment in education: Evidence from Ghana. *The Journal of International Trade & Economic Development*, 8199(February), 1–28.
- Hanushek, E. A. (2013). Economic growth in developing countries: The role of human capital. *Economics of Education Review*, 37, 204–212.
- Huay, C.S., & Bani, Y. (2018). Remittances, poverty and human capital: Evidence from developing countries. *International Journal of Social Economics*, 45(8), 1227–1235. <https://doi.org/10.1108/IJSE-10-2017-0454>
- Huay, C.S., Winterton, J., Bani, Y. & Matemilola, B.T. (2019). Do remittances promote human development? Empirical evidence from developing countries, *International Journal of Social Economics*, 46-10, 1173-1185. <https://doi.org/10.1108/IJSE-12-2018-0673>.
- Hubert Ebeke, C. (2012). Do Remittances Lead to a Public Moral Hazard in Developing Countries? An Empirical Investigation. *Journal of Development Studies*, 48(November), 1009–1025.
- Koska, O. a., Saygin, P. Ö., Çağatay, S., & Artal-Tur, A. (2013). International migration, remittances, and the human capital formation of Egyptian children. *International Review of Economics & Finance*, 28, 38–50. <http://doi.org/10.1016/j.iref.2013.05.006>.
- Kugler, M. (2006). Migrant remittance, human capital creation and job creation externalities in Colombia. *Coyuntura Social*, 34,45–74.
- Mansour, W., Chaaban, J., & Litchfield, J. (2011). The impact of migrant remittances on school attendance and education attainment: Evidence from Jordan. *International Migration Review*, 45, 812–851.
- McKenzie, D., & Rapoport, H. (2006). Can Migration Reduce Educational Attainments ? Depressing Evidence from Mexico Depressing Evidence from Mexico. *Development*, (1), 1–42.
- McKenzie, D., & Rapoport, H. (2011). Can migration reduce educational attainment? Evidence from Mexico. *Journal of Population Economics*, 24(4), 1331–1358.
- Ngoma, A. L., & Ismail, N. W. (2013). Do migrant remittances promote human capital formation? Evidence from 89 developing countries. *Migration and Development*, 2(1), 106–116.
- Nguyen, C. V., & Nguyen, H. Q. (2015). Do internal and international remittances matter to the health, education and labor of children and adolescents? The case of Vietnam. *Children and Youth Services Review*, 58, 28-34.
- Orozco, Manuel, (2003). Worker Remittances: An International Comparison. Working Paper commissioned by the Multilateral Investment Fund, Inter-American Development Bank, February.
- Ramey, G., & Ramey, V. A. (1995). Cross-country evidence on the link between volatility and growth. *American Economic Review*, 85 (5), 1138–1151.
- Rapoport, H., & Docquier, F. (2005). The economics of migrants' remittances, Discussion Paper Series IZA DP No. 1531, IZA, Bonn, Germany.
- Salas, V. B. (2014). International remittances and human capital formation. *World Development*, 59(2003), 224–237.
- Solow, R. M. (1956). A contribution to the theory of economic growth. *Quarterly Journal of Economics*, 70, 65-94.
- World Bank, 2013. Migration and remittance flows: recent trends and outlook, 2013-2016.
- Zhunio, M. C., Vishwasrao, S., & Chiang, E. P. (2012). The influence of remittances on education and health outcomes: a cross country study. *Applied Economics*, 44(35), 4605–4616.