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# GROWTH EFFECT OF MIGRANT REMITTANCES AND HUMAN CAPITAL: PANEL EVIDENCE FROM SUB-SAHARAN AFRICAN COUNTRIES

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**ABSTRACT**

**Purpose:** The aim of this study is to examine the growth effect of migrant remittances and human capital in sub-Saharan Africa (SSA) economies.

**Theoretical Framework:** The study adopts the Cobb-Douglas production function of the AK model to examine the growth effect of migrant remittances and human capital in sub-Saharan Africa (SSA) economies.

**Design/Methodology:** Data from 27 SSA countries for the period 2000-2020 was obtained from the World Development Indicator, a publication of the World Bank. The study variables include, real per capita income, migrant remittances, human capital, domestic investment, trade openness and inflation. The panel fully modified ordinary least square (PFMOLS) technique was deployed to analyse the study model. **Findings:** The study's outcome showed that migrant remittances positively influence and cause growth while human capital has not contributed to growth in the SSA region.

**Research, Practical & Social Implication:** From the study findings, it is recommended that regional government should encourage the continuous inflow of migrant remittances to their countries and make conscious efforts in developing the level of human capital in their country via constant training, reducing or eradicating the number of school drop-out at all levels (primary, secondary, and tertiary).

**Originality/Value:** In this study, the issue of migrant remittances, human capital and growth is re-examined by (i) considering a panel of similar economies, (ii) estimating Cobb-Douglas production function for the effect of migrant remittances via technology and human capital, (iii) adopting a robust technique (PFMOLS) that relax the assumption of homogeneity among parameters across economies and the exogeneity of migrant remittances.

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## EFEITO DE CRESCIMENTO DAS REMESSAS DE MIGRANTES E DO CAPITAL HUMANO: PAINEL DE PROVAS DE PAÍSES DA ÁFRICA SUBSAARIANA

**RESUMO**

**Objetivo:** O objetivo deste estudo é examinar o efeito do crescimento das remessas de migrantes e do capital humano nas economias da África Subsaariana (AAS).
**Estrutura Teórica:** O estudo adota a função de produção de Cobb-Douglas do modelo AK para examinar o efeito de crescimento das remessas de migrantes e do capital humano nas economias da África Subsaariana (SSA).
**Design/Metodologia:** Os dados de 27 países do SSA para o período 2000-2020 foram obtidos a partir do Indicador Mundial de Desenvolvimento, uma publicação do Banco Mundial. As variáveis do estudo incluem renda per capita real, remessas de migrantes, capital humano, investimento interno, abertura comercial e inflação. Foi implantada a técnica PFMOLS (técnica ordinária pelo menos quadrado) totalmente modificada do painel para analisar o modelo do estudo.
**Constatações:** O resultado do estudo mostrou que as remessas de migrantes influenciam positivamente e causam crescimento, enquanto o capital humano não contribuiu para o crescimento na região do AOS.

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**Pesquisa, Implicação Prática & Social:** A partir dos resultados do estudo, recomenda-se que os governos regionais incentivem o fluxo contínuo de remessas de migrantes para seus países e façam esforços conscientes no desenvolvimento do nível de capital humano em seu país através da formação constante, reduzindo ou erradicando o número de abandono escolar em todos os níveis (primário, secundário e terciário).
**Originalidade/valor:** Neste estudo, a questão das remessas de migrantes, capital humano e crescimento é reexaminada (i) considerando um painel de economias semelhantes, (ii) estimando a função de produção de Cobb-Douglas para o efeito das remessas de migrantes através da tecnologia e do capital humano, (iii) adotando uma técnica robusta (PFMOLS) que flexibiliza o pressuposto de homogeneidade entre os parâmetros das economias e a exogeneidade das remessas de migrantes.

**Palavras-chave:** Remessas de Migrantes, Capital Humano, Crescimento.

**EFECTO DEL CRECIMIENTO DE LAS REMESAS DE LOS MIGRANTES Y EL CAPITAL HUMANO: PRUEBAS DE PANEL DE LOS PAÍSES DEL ÁFRICA SUBSAHARIANA**

**RESUMEN**
**Objetivo:** El objetivo de este estudio es examinar el efecto del crecimiento de las remesas de los migrantes y el capital humano en las economías del África subsahariana.
**Marco teórico:** El estudio adopta la función de producción de Cobb-Douglas del modelo AK para examinar el efecto de crecimiento de las remesas de los migrantes y el capital humano en las economías del África subsahariana.
**Diseño/Metodología:** Los datos de 27 países del ASS para el período 2000-2020 se obtuvieron del World Development Indicator, una publicación del Banco Mundial. Las variables de estudio incluyen: ingreso real per cápita, remesas de migrantes, capital humano, inversión interna, apertura comercial e inflación. Para el análisis del modelo de estudio se utilizó la técnica de mínimos cuadrados ordinarios totalmente modificados (PFMOLS).
Hallazgos: Los resultados del estudio mostraron que las remesas de los migrantes influyen positivamente y causan crecimiento, mientras que el capital humano no ha contribuido al crecimiento en la región del ASS.
**Investigación, implicaciones prácticas y sociales:** A partir de los hallazgos del estudio, se recomienda que el gobierno regional aliente el flujo continuo de remesas de los migrantes a sus países y haga esfuerzos conscientes para desarrollar el nivel de capital humano en su país a través de una capacitación constante, reduciendo o erradicando el número de deserción escolar en todos los niveles (primaria, secundaria y terciaria).
**Originalidad/Valor:** En este estudio se reexamina el tema de las remesas de los migrantes, el capital humano y el crecimiento: (i) considerando un panel de economías similares, (ii) estimando la función de producción de Cobb-Douglas para el efecto de las remesas de los migrantes vía tecnología y capital humano, (iii) adoptando una técnica robusta (PFMOLS) que relaja el supuesto de homogeneidad entre parámetros entre economías y la exogeneidad de las remesas de los migrantes.

**Palabras clave:** Remesas de Migrantes, Capital Humano, Crecimiento.

## INTRODUCTION

The stable inflow of migrant remittances into developing economy as being adjudged as a veritable source of development finance for savings, investment and growth by some scholars, development experts and policymakers. However, some previous empirical work on the growth effect of migrant remittances show mixed findings while some studies argued that migrant remittances retard growth (Kratou & Gazdar, 2015; Adams & Klobodu, 2016; Anetor, 2019; Xinying et al., 2019) since the inflow of migrant remittances can fuel inflation, create dutch diseases, brain drain among others. On the other hand, others claimed that migrant remittances enhanced growth positively because the recipient now has an additional income to augment and raise its standard of living since the additional source of income can be used for

consumption, education and investment purpose and this is in turn enhances growth (Lartey, 2013; John et al., 2015; Adjeji et al., 2020; Sghaier, 2021).

Aside migrant remittances being a driver of growth, human capital has also been identified as a key factor in attaining growth (Pelinescu, 2015; Kartal et al., 2017; Ngepah et al., 2021). Empirical studies have affirmed that human capital helps to develop an economy via expansion of skills and knowledge of its citizen. More so, employers with high level of education tend to have higher earnings and this in turn boost economic growth via additional consumer spending. However, based on World Bank (2019) report, the SSA region has a weak human capital base due to low school enrolment rate, dropout of pupils and adolescent being high, and high pupil teacher ratio, which in turn, has contributed to the low level of human capital development (Karambakuwa et al., 2020).

In this study, the issue of migrant remittances, human capital and growth is re-examined by (i) considering a panel of similar economies, (ii) estimating Cobb-Douglas production function for the effect of migrant remittances via technology and human capital, (iii) adopting a robust technique that relax the assumption of homogeneity among parameters across economies and the exogeneity of migrant remittances (iv) estimating the effect of migrant remittances and human capital on growth using panel fully modified ordinary least square. Findings from the study revealed that while migrant remittances positively influence growth, human capital have not contributed to growth in the SSA region.

The rest of the paper is as follows: section 2 shows the literature review, section 3 shows the theoretical framework and methodology, section 4 discusses the result, while section 5 concludes the paper.

## THEORETICAL FRAMEWORK

According to the two-gap theory, developing economies are faced with a savings-investment gap and a foreign exchange gap, and an inflow of foreign capital is usually needed in closing the gap (Chenery, & Strout, 1968). Also, several theories such as developmental optimistic theory and complementarity theory have all accounted for why migrant remittances is needed to boost growth in developing economies. Aside this theories, several empirical evidence abound on the positive effects of migrant remittances on growth. Empirical findings by Lartey (2013) revealed that migrant remittances facilitate growth of 36 SSA economies using the GMM approach between the period 1990 to 2008. Also, findings by John et al., (2015)

indicates that for the period 2000 -2013 migrant remittances improves growth of 10 member states of ECOWAS using a GMM technique.

Research findings by Fasanya and Baruwa (2015) also indicates that migrant remittances contributes to growth between the period of 1970 – 2011 of six countries in the West Africa Monetary Zone (WAMZ) region. In addition, Olusuyi et al., (2017) concluded that migrant remittances enhance growth in Nigeria. Shah and Majid (2018) employing ordinary least square and vector error correction model technique, concluded that migrant remittances positively influence Pakistan's growth between the period 1973 to 2015. Adjei et. al., (2020) documented that migrant remittances improves growth in 7 West Africa economies. Sghaier (2021) also concluded that migrant remittances enhance growth in 7 MENA economies for the period 2000 to 2018.

Furthermore, some other studies assert that migrant remittances retard growth. Kratou and Gazdar (2015) documented that migrant remittances retard growth in 12 MENA countries between the period 1984 to 2011. Also, Adams and Klobodu (2016) noted that migrant remittances does not affect growth in 36 SSA for the period 1970 to 2012. Uprety (2017) concluded that in Nepal migrant remittances has an adverse effect on growth. Uprety (2017) using ECM techniques on data obtained from Nepal's economy for the period 1976 to 2013 concluded that migrant remittances retard growth in Nepal. Anetor (2019) documented that migrant remittances retard growth in Nigeria for the period 1981 to 2017. Xinying, Oppong, & Vitenu-Sackey (2019) employing the panel data technique showed that between the period 1991 to 2017, migrant remittances had an adverse effect on growth in fifteen economies in West Africa.

Aside migrant remittances having an effect of growth, studies in the empirical literature also affirmed that human capital affects growth also. Pelinescu (2015) employing a panel data and pooled OLS technique concluded that human capital positively drives growth in EU member states between the period of 2002 to 2012. Kartal et al., (2017) documented that for the period 1960 to 2011 that human capital contributes to growth of Turkey economy positively. Mudassaar (2019) showed that human capital positively affects growth using a disaggregated sample of developing and developed countries in East, West, and South Asia. Ngepah et al., (2021) employing the GMM technique concluded that human capital facilitates growth in South Africca. Bawono (2021) also showed that human capital drives growth in Indonesia for the period 1984- 2019 using autoregressive distributed lag (ARDL) method approach. Pomi et al., (2021) employing vector autoregressive model (VAR) technique concluded that human capital

promotes economic growth in Bangladesh for the period 2000 to 2019. Bawazir, & Nor (2023) documented using ARDL that human capital positively affects Turkey's growth in the short-run for the period 1990 to 2020.

Few other studies documented that human capital either has an insignificant effect on growth or has an adverse effect on growth. Fleisher et al. (2010) concluded that human capital has an indirect effect on growth in China. Rizal and Nurruhwati (2018) documented that in Indonesia, human capital has an adverse effect on growth. Using panel fully modified ordinary least square and dynamic ordinary least square, Karambakuwa et al., (2020) documented that human capital has an insignificant effect on growth in 16 SSA economies for the period 1980 to 2014. Nwani (2021) employing a system generalised method of moments (SGMM) concluded that for the period 1985 to 2019 human capital has an adverse effect on growth in South Asia and sub-Saharan Africa region. Arwani et al., (2023) concluded that human development index did not significantly impact growth in Central Java Province for the period 2015-2020.

## METHODOLOGY

The study used data from twenty-seven (27) countries in SSA between the period 2000-2020. The study variables include, real per capita income (GDP per capita), migrant remittances (MR), human capital (HC), domestic investment (DI), trade openness (TO) and inflation (INF). The data on these variables was sourced from world development indicator, a publication of world bank. Table 1 depicts variables description, notation, and measurement.

Table 1: Variables' description, notation and measurement

| Variable | Notation | Measurement |
|---|---|---|
| GDP per capita growth rate | GDPPCGR | calculated by dividing GDP at constant prices by the population of a country or area. |
| Migrant Remittances | REM | Ratio of migrant remittances to GDP. |
| Domestic Investment | DI | Gross capital formation (i.e. ratio of gross capital formation divided by GDP |
| Human Capital | HC | Secondary school enrollment (% gross) |
| Trade Openness | TOP | Ratio of the sum of exports plus imports of goods to total output |
| Inflation | INF | Consumer price index (annual % change in the cost to the average consumer of acquiring a basket of goods and services |

Source: Author (2023)

Following previous studies, this paper adopts the Cobb-Douglas production function of the AK model given as:

$$Y_{it} = f(A_{it}K_{it}) \quad (1)$$

Where:

$Y_{it}$ is output
$A_{it}$ is technology
$K_{it}$ is physical capital

Based on empirical evidence, technology (A) can be determined by migrant remittances (MREM), and human capital (HC). Hence equation (1) becomes:

$$A_{it} = f(MREM_{it}HC_{it}) \quad (2)$$

Substituting equation (2) in equation (1) becomes:

$$Y_{it} = f(MREM_{it}HC_{it}K_{it}) \quad (3)$$

The study includes the following control variables such as trade openness(TO) and inflation (INF) to capture the macroeconomic stability of the model. Hence, equation (3) becomes:

$$Y_{it} = f(MREM_{it}HC_{it}K_{it}TO_{it}INF_{it}) \quad (4)$$

Replacing $Y_{it}$ with $GDPPC_{it}$ and $K_{it}$ with $D_{it}$ equation (4) becomes:

$$GDPPC_{it} = f(MREM_{it}HC_{it}K_{it}TO_{it}INF_{it}) \quad (5)$$

Expressing equation (5) in econometric form becomes:

$$GDPPC_{it} = \beta_0 + \beta_1 MREM_{it} + \beta_2 HC_{it} + \beta_3 D_{it} + \beta_4 TO_{it} + \beta_5 INF_{it} + \mu_t \quad (6)$$

Where

$\beta_0$ is constant
$\beta_1$ to $\beta_5$ are parameters to be estimated
$\mu_t$ is error term

The above model was estimated using a robust technique called panel fully modified ordinary least square (PFMOLS). The choice of this technique is because it addresses the issues of serial correlation and endogeneity in the model specification and it gives an unbiased and consistent estimates.

## RESULTS AND DISCUSSION

The study employed the Augmented Dickey-Fuller (ADF) and PP (Phillips-Perron) unit root test to ascertain the variables' stationarity. The essence of carrying out this test is to ascertain if the variables are stationary at level 1(0) or at first difference 1(1) Table 2 shows the outcome of the stationarity test. As shown in Table 2, both test statistic ADF and PP unit root test confirmed that the variables are stationary at first difference. Hence, the null hypothesis of the existence of unit root is rejected. Thus, indicating all variables are integrated in the order of one i.e. 1(1). Since the variables are stationary at 1(1), it becomes necessary to examine if the variables have a long-run link.

Table 2 Stationarity Test: First Difference

| | **ADF** | **PP** |
|---|---|---|
| **VARIABLES** | **t-statistic** | **t-statistic** |
| GDPPCGR | 298.619*** | 571.87*** |
| REM | 243.421*** | 426.895*** |
| DI | 195.824*** | 415.905*** |
| HC | 136.761*** | 415.905*** |
| TOP | 194.486*** | 379.42*** |
| INF | 338.753*** | 551.834*** |

Note: *** represent level of significance at 1%.
Source: Author's Computation from E-Views (2023)

The correlation matrix result is reported in Table 3. The essence of carrying out this test is to ascertain if the variables used in the model are strongly correlated. The outcome in Table 3 indicates that the variables of the study are weakly correlated. Also, while DI, TOP and INF are positively correlated with GDPPCGR, MREM and HC are negatively correlated with GDPPCGR.

Table 3: Correlation Matrix

| | GDPPCGR | MREM | HC | DI | TOP | INF |
|---|---|---|---|---|---|---|
| GDPPCGR | 1.000000 | -0.023912 | -0.025968 | 0.176243 | 0.067781 | 0.090557 |
| REM | | 1.000000 | 0.162885 | 0.154885 | 0.107179 | -0.114098 |
| HC | | | 1.000000 | 0.083168 | 0.275646 | -0.083849 |
| DI | | | | 1.000000 | 0.357238 | -0.042774 |
| TOP | | | | | 1.000000 | -0.012847 |
| INF | | | | | | 1.000000 |

Source: Author's Computation from E-views (2023)

The panel cointegration result is reported in Table 4. The panel cointegration test was carried out using Kao test technique and Pedroni test technique. The essence of carrying out this test is to ascertain if the variables are cointegrated i.e. have long run relationship. From the outcome in Table 4, it is revealed that both techniques confirmed that the variables of the study have a long-run relationship i.e. the variables are cointegrated.

Table 4: Panel Cointegration

| Estimates | Statistic |
|---|---|
| **Kao test** | |
| Panel ADF-statistic | (4.728)*** |
| **Pedroni test** | |
| Panel PP-statistic | (12.5034)*** |
| Panel ADF-statistic | (2.245)*** |

Note: ***, represent 1%
Source: Author's Computation from Stata (2023)

Table 5 shows the panel fully modified ordinary least square (PFMOLS) long-run estimates. The results reveal that the coefficient of migrant remittance (MREM) is positive and significant indicating that migrant remittance positively drives growth in Sub-Saharan Africa. The rationale for this is that via migrant remittances, recipient has been able to augment their income and hence improve their standards of living in terms of increasing their consumption, investing in education, and embarking on productive ventures and this in turn boost growth in the region. The outcome of this result is in line with previous research works (Lartey, 2013; John et al., 2015; Adjeji et al., 2020; Sghaier, 2021) who affirmed that migrant remittances indeed boost and enhance growth.

Table 5. Fully Modified OLS Estimates of GDPPC

| Variables | Coeff. | t-stat | p-value |
|---|---|---|---|
| MREM | 0.119 | 2.073 | 0.039 |
| HC | (0.033) | -3.660 | 0.0003 |
| DI | 0.001 | 0.059 | 0.953 |
| TOP | 0.002 | 0.280 | 0.780 |
| INF | 0.007 | 1.964 | 0.050 |
| R-squared | 0.262 | | |
| Adjusted R-squared | 0.173 | | |
| Panel | 27 | | |
| No of observations | 539 | | |

Source: Author's Computation from E-views (2023)

In addition, the study also indicates that the coefficient of human capital (HC) is negative and significant. This implies that human capital has not contributed to growth in the SSA region since in most of the SSA countries the level of illiteracy rate, school drop-out, and brain drain is quite high. More so, quality manpower is lacking in most of the SSA economies.

The outcome of this study is in line with previous studies (Rizal & Nurruhwati, 2018; Nwani, 2021) that affirmed that human capital has not contributed to growth in the region.

Furthermore, the study also shows that domestic investment (DI) and trade openness (TO) is positively related to growth but are yet to cause growth in the region since the level of domestic investment is not sufficient to cause growth thus the reliance of foreign income. Also, in most of the SSA economies, there is still some existence of trade barriers, thus hindering the beneficial effect of trade openness in causing growth. Besides, the study outcome also showed that inflation has a positive and significant effect on growth.

## CONCLUSION

This study investigated the growth effect of migrant remittances and human capital in SSA economies. Data on 27 SSA economies for the period 2000-2020 was obtained for the purpose of this study from the World Development Indicator, a publication of the World Bank. Employing PFMOLS technique, the study affirmed that migrant remittances positively influence and cause growth while human capital has not contributed to growth in the SSA region. From the study findings, it is recommended that regional government should encourage the inflow of migrant remittances to their countries by ensuring the cost of transfer is reduced, and financial institutions should develop migrant remittances financial product to recipients in order to channels the funds to productive sector of the economy. In addition, regional government should also make conscious efforts in developing the level of human capital in their country via constant training, reducing or eradicating the number of school drop-out at all levels (primary, secondary, and tertiary).

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