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## Do remittances affect labor market outcomes in Sub-Saharan Africa

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## Abstract

In this paper, I estimate the effect of remittances on labor market outcomes in sub-Saharan Africa over the period 1975–2019. Using the dynamic system-GMM approach with remittances treated as endogenous, baseline estimates indicate that remittance flows have a significant effect on many labor market outcomes: they increase labor force participation and self-employment rates and significantly decrease unemployment. Robustness checks then show that remittances are associated with workers moving from underemployment to self-employment without increasing labor force participation or wage and salaried work. These findings suggest that to be successful in sub-Saharan Africa, reforms designed to foster productive employment across the labor force should factor in the benefits of remittances.

# 1. Introduction

The role of remittances in economic development remains an important issue for researchers and policymakers (Shapiro and Mandelman, 2016). Both are attracted to remittances because their permanence and volume have made them one of the most important sources of foreign exchange and household income in many developing economies, including sub-Saharan African (SSA) countries (Williams, 2017). Globally, total official flows of remittances were US$654.3 billion in 2019, compared to US$66.4 billion in 1990 (WDI, 2020). Although SSA countries received the lowest share of global remittances (US$47.3 billion in 2019) among developing countries, remittances play a major role in SSA economies.

In 2019, remittance inflows in the SSA region were the highest as a share of GDP among all developing countries bar those in South Asia. They were estimated at 2.75% of GDP, compared to 3.89% for South Asia, 0.43% for East Asia and the Pacific, 1.92% for Latin America and the Caribbean and 2.17% for the Middle East and North Africa (WDI, 2020). In 1990, remittance inflows accounted for just 0.79% of SSA GDP (WDI, 2020). In several SSA countries, remittance income often surpasses 10% of GDP. This is case in Lesotho, Gambia, Cabo Verde, the Comoros and Senegal for instance, where the remittance inflows as a share of GDP in 2019 were 20.8%, 15.1%, 11.9%, 11.6% and 10.7% respectively (WDI, 2020). In spite of this drastic increase in received remittance flows[1] as a share of GDP (Figure 1), labor market indicators have not followed the same path. While unemployment and labor force participation are practically stable, the rates of self-employment and vulnerable employment have decreased. The only increase in SSA countries, and a slight one, has been in the share of wage and salaried workers in total employment (Figure 1).

A natural question is therefore whether remittances affect labor market outcomes in sub-Saharan Africa. Addressing this question is important for policymakers in remittance-receiving countries who have been trying to design policies to increase employment or improve employment opportunities for their citizens. Labor market outcomes are also major determinants of growth since the quantity and the quality of labor in an economy contribute to potential GDP as well as to the growth rate of actual GDP (Chami et al., 2018).

This study fits into a larger literature on the effects of remittances on various aspects of economic development in SSA countries (Tah, 2019; Amega and Tajani, 2018; Williams, 2017; Akobeng, 2016; Coulibaly, 2015; Ahamada and Coulibaly, 2013). For instance, Akobeng (2016) suggested that an increase in remittances as a share of GDP may lead to a significant decline in the number of poor people, and in the depth of poverty and inequality. Ahamada and Coulibaly (2013) further examined the causal link between remittances and economic growth in SSA countries and found no such relationship in any given country between remittances and growth. The explanation they gave was that remittances do not increase physical investment in the region. Later, Coulibaly (2015) concluded that there was no strong evidence supporting the view that remittances promote financial development in SSA countries. This finding has since been confirmed by Olayungbo and Quadri (2019). Recently, Williams (2017) found that remittances improve democratic institutions by increasing schooling and reducing poverty. Amega and Tajini (2018) also found that remittances had a positive effect on education and health in sub-Saharan Africa, and Njangang et al. (2018) concluded that remittances increase the size of the informal economy in these countries. Notwithstanding the importance of the abovementioned aspects of economic development in SSA, studies to date have surprisingly overlooked another potentially

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[1] Between 2005 and 2006, remittances increased dramatically. And this increase has been relatively maintained afterwards compared to the beginning of the 2000s. If we refer to the explanations of El Mouhoud (2016), this observed increase in migrants' transfers could be explained, among other things, by the improvements in their recording which have started since the september 2001 attacks. Clemens and McKenzie (2014) even essentially associate the observed increase in these transfers with changes in the way they are measured.

crucial dimension, namely labor market outcomes. Our contribution in this article is an empirical analysis of the effects that remittances have on labor market outcomes in sub-Saharan Africa.

In theory, remittances can affect labor market outcomes in several ways. First, households receiving remittances may use them as an additional source of income. If this extra revenue is greater than the income lost because of the sender's departure, family members may choose leisure over work because of the increase in reservation wages associated with this income. In this case, remittances should have an adverse effect on labor force participation and both the likelihood of employment, and the hours worked by relatives (Sharma and Cárdenas, 2018; Posso, 2012). Second, because the remitter and the recipient are separated by long distances for long periods, remittance transfers are made under conditions of asymmetric information (Chami et al., 2005). This may lead to moral hazard as the absence of remitter oversight means the recipient has little incentive to search for a job. In the extreme, this may allow the relative in the home country to enjoy leisure at the migrant's expense and choose not to work at all (Vadean et al., 2019) or search for a new job. Third, in the presence of credit constraints in home countries, remittances may ease the capital constraints associated with starting a new family business and thus promote entrepreneurship. This last effect should generate wealth, and boost labor force participation and employment rates (Kakhkharov, 2019; Sharma and Cárdenas, 2018).

However, when the supplementary non-labor income from remittances matches the labor income lost because of migration, the effect on labor force participation, and on the hours worked by remaining household members is likely to be neutral (Sharma and Cárdenas, 2018). It may also be that while an increase in remittances reduces the labor supplied by the recipient household, it simultaneously increases the labor supplied by households in the same cluster that are seeking to help a family member migrate (Posso, 2012). This positive externality of remittances arises when households in the vicinity become aware of the benefits of remittances, in starting a new business for instance, or in building a new house or buying a new car.

This theoretical debate has proved impossible to disentangle into reliable conclusions for policy makers. The effects of remittances can thus only be ascertained by empirical observation.

Figure 1. Evolution of regional-level labor market outcomes and received remittances (in constant US$) in sub-Saharan Africa.
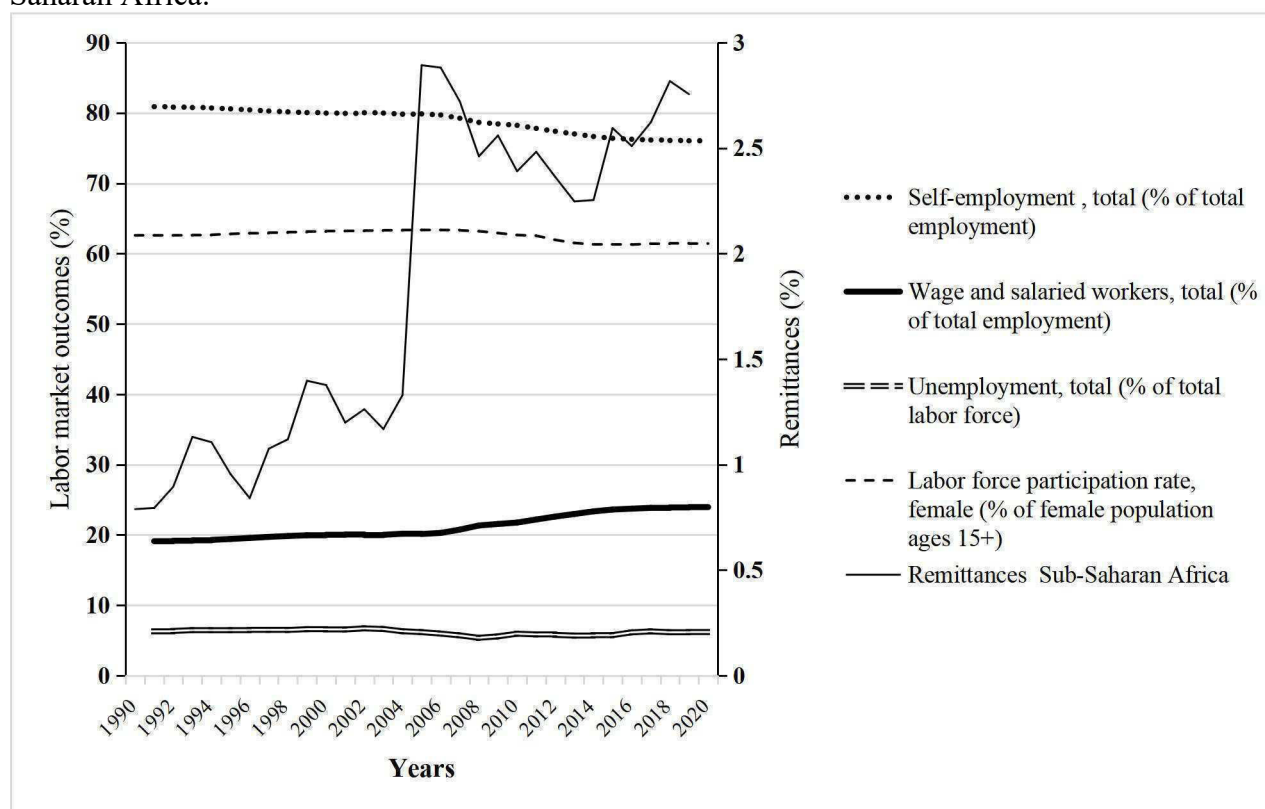


Source: Author from WDI (2020)

The objective of this article is to examine the effects of remittances on labor market outcome in SSA countries. This study aims to add to a growing body of literature on the effects of remittances on labor market outcomes by considering various measures of these outcomes, including labor force participation rates, unemployment, self-employment, and wage and salaried work. It also commits to plausibly address the problem of endogeneity of remittances in regressions related to labor market indicators. This study is based on macro-level data from 44 countries over the period 1975–2019, using dynamic system-GMM estimation, to capture externalities associated with remittances, which are difficult to measure using micro-level data (Sharma and Cardenas, 2018; Posso, 2012). The key robust results are that remittances are negatively associated with unemployment and positively associated with self-employment. Remittances seem to move workers in SSA countries from underemployment to self-employment without improving labor force participation or levels of wage and salaried work. These findings are new and useful contributions to the literature on public policies in sub-Saharan Africa.

The rest of this article is organized as follows. Section 2 is a literature review. Section 3 discusses the econometric strategy and section 4 reviews the data. Empirical results are presented in section 5 and the robustness of the baseline results are tested in section 6 before the final section concludes.

## 2. Literature review

Several studies have been carried out to empirically identify the effects of remittances on labor markets outcomes across countries, with varying results. Using microeconomic data on the Republic of Haiti for example, Jadotte and Ramos (2015) point to a decline in labor participation and in number of hours worked in the presence of remittances. Acosta et al., 2008, based on data from 10 Latin American and Caribbean countries, also conclude that in rural and urban areas, remittances lead to a reduction in the number of hours worked per week. In Mexico similarly, Airola (2008) found that remittances have a negative effect on the number of hours worked by household heads. Using aggregate-level data from a panel of 66 developing countries over the period 1985–2005, Posso (2012) found a significant positive relationship between remittances and labor force participation rates. Azizi (2018) in contrast, using data from developing countries, suggests instead that remittances decrease female labor force participation and do not affect male labor force participation.

Some of Chami et al.'s (2018) findings are consistent with the above results, but these authors consider other aspects of the labor market in their analysis of labor supply in various regions of the world, notably wages, unemployment, and labor market informality. They find that remittances reduce labor force participation and unemployment but increase labor market informality. In fragile states however, they find that remittances increase wage growth but do not reduce labor force participation, which is the opposite of the effects found on average and in more stable states. Sharma and Cardenas (2018) have also examined various labor market outcomes, in their case in Mexico, finding that remittances increase labor force participation rates and reduce median hours worked, low-wage employment and unemployment duration. These findings regarding labor force participation are contrary to those reported elsewhere suggesting that remittances induce dependency. In particular, Justino and Shemyakina (2012) find that adults in remittance-receiving households in Tajikistan are less likely to participate in the labor market and work fewer hours, with a much stronger effect for men than for women.

Cox-Edwards and Rodriguez-Oreggia (2009) reach a different conclusion based on data from the 2002 Mexican National Quarterly Employment Survey, namely that remittances have an insignificant effect on labor force participation, although in urban areas with low migration rates, persistent remittances increase the labor force participation of women, probably by improving their labor market opportunities through the establishment of family enterprises. Amuedo-Dorantes and Pozo (2006), also using data from Mexico, show that while women in rural areas seem to reduce their supply of labor, men tend to shift their labor supply from the formal to the informal sector when they receive remittances. Using data from the Social Exclusion Survey conducted in six transition economies, Ivlevs (2016) also finds that receiving remittances increases the likelihood of working informally. Finally, Vadean et al. (2019) show that men receiving remittances in Tajikistan were less likely to

work in wage employment and more likely to be self-employed, with no effect on the number of job-specific hours worked

# 3. Econometric strategy

I use panel analysis to estimate how remittances affect labor market outcomes in SSA countries. Following Williams (2017), the dynamic panel model I want to estimate can be written

$$\Delta Y_{it} = \beta Y_{it-1} + \gamma Remittances_{it-1} + \theta X_{it-1} + \mu_i + \alpha_t + \varepsilon_{it} \qquad (1)$$

where $\Delta Y_{it}$ is a measure of the change in a given labor market indicator in country $i$ between year $t$ and year $t$-1. The labor market indicators I consider here are the shares of wage and salaried employment in total employment, and the rates of self-employment, unemployment, and labor force participation. The lagged dependent variable on the right-hand side of Equation (1) captures dynamic effects and the persistence of the labor markets indicators.

The main explanatory variable of interest is $Remittances_{it-1}$, the lagged value of the ratio of remittances to GDP in country $i$. I follow the common practice in the literature in measuring remittances as the sum of personal transfers and compensation of employees (Williams, 2017). Personal transfers are current transfers in cash or in kind made by migrants employed in their host country (World Bank, 2020). These transfers include income earned from labor and from other sources.

The vector $X_{it-1}$ is a set of control variables that predict the labor market indicators. These control variables are the log population size, education indicators, GDP per capita, the level of urbanization, the share of trade in GDP, and the size of the active part of the population. The World Bank definitions of these variables are given in Table A1 in the appendix. The coefficient of interest is $\gamma$, while $\theta$ is a vector of coefficients associated with the effects of the controls on the labor market indicators. The term $\mu_i$ is a country fixed effect controlling for omitted time-invariant non-observables, for example history and geography. By including country fixed effects in Equation (1), the impact of remittances on labor force indicators is identified from within-country variations. The time fixed effects, $\alpha_t$, account for shocks affecting both remittances and labor market indicators, such as from the worldwide business cycle (e.g. a global financial crisis) or a global health crisis (e.g. COVID-19). The term $\varepsilon_{it}$ is an idiosyncratic error term representing unobserved effects on the labor market indicators.

Estimating the effect that remittances have on labor market outcomes is problematic because of the reverse effect of labor market indicators on remittances. International migrants may have left their country of origin to escape poor labor market outcomes and in turn, send remittances home to help relatives find a job or start a new business, thereby boosting employment opportunities in the country. Estimating Equation (1) by ordinary least squares (OLS) regression in the presence of endogeneity is econometrically problematic: the coefficients of interest, $\gamma$ are likely to be biased. In other words, the effects of remittances on labor market outcomes are confounded with unobservable determinants and identifying causal inference is not feasible without addressing the endogeneity problem (Sharma and Cárdenas, 2018).

One way to address this identification problem is to include remittances lagged by one period on the right-hand side of Equation (1) to predict current changes in labor market outcomes. Changes in current labor market outcomes are unlikely to predict remittances in the preceding period. A second possibility is to use instrumental variables (IV) estimation. However, strong instruments are difficult to find at the aggregate level (Sharma and Cárdenas, 2018). Even if a strong instrument can be found, another drawback of IV techniques is that they do not control for endogeneity in the other regressors, which can bias the relationship between remittances and labor market outcomes (Williams, 2017). Standard IV estimation was therefore not used here.

A third possible solution, since this study uses panel data, is to rely on fixed effects estimation. Fixed effect estimation removes a potential source of endogeneity by differentiating out time-invariant country-specific unobserved variables that are correlated with remittances. Though country fixed effects estimation is a key step forward in estimating the causal impact of remittances because they reduce endogeneity from time-invariant

omitted variables, Nickell (1981) has shown that there is an asymptotic bias in first-order autoregressive models estimated by OLS using panel data and including individual fixed effects. Therefore, to address this econometric concern more rigorously, I follow the common approach in the literature (Sharma and Cárdenas, 2018; Williams, 2017) of using dynamic system generalized method of moments (GMM) estimation with lagged values as instruments for the independent variables (Blundell and Bond, 1998). The system GMM approach involves two equations: one in first differences and the other in levels in a system of equations. The advantage of the second equation is that it provides additional instruments. Lagged first differences of remittances are used as instruments for the equation in levels and lagged levels of remittances are used as instruments for the equation in first differences. This usually improves the efficiency of the method (Sharma and Cárdenas, 2018).

The consistency of system GMM estimations rests on two conditions being fulfilled. First, the instrumental variables created from the lagged values of the explanatory variable must be valid, and second, the idiosyncratic error terms must not be serially correlated (Arellano and Bond, 1991). Satisfaction of the first condition can be verified using a Hansen test of exogeneity of instruments, under the null hypothesis of overall validity of the instruments. Non-rejection of the null hypothesis means the instruments are valid. For the second condition, the presence of second-order serial correlation implies that the moment conditions are not valid, and therefore that the estimates cannot be considered consistent. I therefore test the significance of the first and second-order serial correlation of the residuals of the first-difference equation and present the correspond p values.

# 4. Data

This study examines data from the 44 SSA countries listed in Table A2 in the appendix. These data are annual and cover the period 1975-2019. They all come from the 2020 World Bank World Development Indicators (WDI). Table A3 in the appendix presents descriptive statistics for the variables included in the estimations. All dollar values in the paper are expressed in constant 2011 US dollars. Table 1 reports the variance inflation factor (VIF) scores of the multicollinearity of the variables included in the model. The fact that the VIF scores are all below 3 indicates that multicollinearity is not a problem in the chosen model.

Table 1. VIF scores to diagnose multicolinearity.

| Variables | (1) Labor force participation | | (2) Unemployment | | (3) Wage and salaried workers | | (4) Self-employment | |
|---|---|---|---|---|---|---|---|---|
| | VIF | 1/VIF | VIF | 1/VIF | VIF | 1/VIF | VIF | 1/VIF |
| Outcome variables, t-1 | 1.38 | 0.7243 | 1.53 | 0.6545 | 1.96 | 0.5106 | 1.79 | 0.5571 |
| Remittances, t-1 | 1.25 | 0.8013 | 1.23 | 0.8147 | 1.22 | 0.8225 | 1.21 | 0.8287 |
| Primary, t-1 | 2.11 | 0.4735 | 1.92 | 0.4735 | 1.87 | 0.5344 | 1.91 | 0.5246 |
| Secondary, t-1 | 2.67 | 0.3751 | 2.66 | 0.3751 | 2.65 | 0.3780 | 2.58 | 0.3880 |
| Trade, t-1 | 1.25 | 0.8013 | 1.25 | 0.8013 | 1.30 | 0.7699 | 1.26 | 0.7924 |
| GDP per capita t-1 | 1.68 | 0.5943 | 1.72 | 0.5800 | 1.80 | 0.5555 | 1.93 | 0.5169 |
| Population, t-1 | 1.38 | 0.7259 | 1.36 | 0.7365 | 1.32 | 0.7263 | 1.38 | 0.7259 |
| Urbanization, t-1 | 1.08 | 0.9249 | 1.08 | 0.9235 | 1.08 | 0.9249 | 1.08 | 0.9249 |
| **Mean VIF** | **1.59** | | **1.59** | | **1.65** | | **1.63** | |

Source: Author

# 5. Empirical results

Tables 2, 3, 4, 5 and 6 report baseline estimates of the average effect of remittances on labor market outcomes from OLS and system-GMM estimators. The models all include all the covariates and the lagged dependent variable as controls. Estimates without fixed effects are reported in Column (1) of each table. Column (2) presents the results with year fixed effects added to the specification to control for common year shocks. Column (3) lists the estimates with country fixed effects included as an additional control variable to consider

country specific characteristics and column (4) presents the results with both year and country fixed effects included. The results corrected for endogeneity bias are shown in Column (5) of each table.

When fixed effects are not considered (Table 2, column (1)), the effect of remittances on labor force participation is significant at the 1 percent level, with a negative regression coefficient of −0.0014. This result suggests that remittances improve labor force participation rates in SSA countries. This association is maintained in columns (2) to (4) when year and country fixed effects are included.

However, in addition to the bias outlined by Nickell (1981) as explained above, a further concern in this study is that remittance flows are driven in part by labor market conditions in the home country. For example, it could be that remittances, rather than driving labor market outcomes in their home country, are instead driven by these labor market outcomes through migrants' desire to help struggling relatives back home. These endogeneity problems are addressed by the dynamic system-GMM estimator where remittances are instrumented by their lagged values. Accounting for endogeneity in this way (column (5)), the estimated coefficient remains significant at the 1 percent level, just as in the baseline OLS results, but is now positive. This is contrary to the results of Chami et *al*. (2018), who found a negative effect. It could be that remittances ease the credit constraints faced in most SSA countries by households wishing to start a family business, thereby boosting labor force participation and employment rates (Kakhkharov, 2019; Sharma and Cárdenas, 2018).

### Table 2. Remittances and change in labor force participation

| | ΔLabor force participation | | | | |
|---|---|---|---|---|---|
| | (1) OLS | (2) OLS | (3) OLS | (4) OLS | (5) Sys-GMM |
| Log LFP, t - 1 | -0.0621 (0.0487) | -0.0559 (0.0483) | -0.2683 (0.3461) | -0.1493 (0.3601) | -0.7854*** (2.2558) |
| Remittances, t - 1 | -0.0014*** (0.0005) | -0.0018*** (0.0005) | -0.0031*** (0.0008) | -0.0037*** (0.0009) | 0.0435*** (0.0093) |
| Control variables | Yes | Yes | Yes | Yes | Yes |
| Year FE | No | Yes | No | Yes | |
| Country FE | No | No | Yes | Yes | |
| Prob > F | 0.0000 | 0.0000 | 0.0000 | 0.0000 | |
| R2 | 0.0380 | 0.0615 | 0.1549 | 0.1775 | |
| AR (1) Test, P-value | | | | | 0.085 |
| AR (2) Test, P-value | | | | | 0.181 |
| Hansen Test, P-value | | | | | 0.465 |
| Groups | 44 | 44 | 44 | 44 | 44 |
| Observations | 1936 | 1936 | 1936 | 1936 | 1936 |

*Notes:* This table presents estimates of the effect of remittances on the change in labor force participation. Lagged variables of logarithms of Primary school enrollment, Secondary school enrollment, Trade, GDP per capita, Urbanization, and Active population are controls of the models estimated. Columns (1–4) present results of least squares estimation with robust standard errors in parentheses. Column (5) presents results of system GMM estimation. AR (1) and AR (2) are first and second order serial correlation tests, respectively. The Hansen test is a test of instrument relevance. ***, ** and * denote significance at the 1, 5, and 10% level, respectively.

On average, the coefficient of the lagged dependent variable is negative and significant at the 1 percent level, highlighting the persistence in labor force participation. The AR (1) test of no first-order serial correlation in the first-difference residuals is rejected at the 10 percent level. The more important AR (2) test of no second order serial correlation in the first-difference residuals is not rejected however, as expected. The p-value of the Hansen test is also more than 0.1, meaning that the null hypothesis is not rejected, and the instruments are relevant. These serial correlation tests together with the Hansen test of instrument relevance suggest that the system-GMM is correctly specified.

Table 3 presents estimates of the effect of remittances on unemployment. In columns (1 and 2), the estimated coefficient for remittances is positive but the effect is not significant. When country effects are included in the model, the coefficient becomes negative but remains non-significant. In column (5), using system-GMM instead of OLS estimation, and thus accounting for endogeneity bias, the coefficient remains negative but the effect of remittances on unemployment becomes strongly significant. This result shows that remittances have an important effect on investment in sub-Saharan Africa. Indeed, remittances allow financially constrained firms to approach their optimal capital stock and expand, leading to a fall in unemployment (Jackman, 2014).

### Table 3. Remittances and change in unemployment

| | ΔUnemployment | | | | |
| --- | --- | --- | --- | --- | --- |
| | (1) OLS | (2) OLS | (3) OLS | (5) OLS | (5) Sys-GMM |
| Log Unemployment, t -1 | -0.2485* | -0.0340** | -0.2431*** | -0.2459*** | -1.9001*** |
| | (0.0141) | (0.0146) | (0.0482) | (0.0466) | (0.1982) |
| Remittances, t - 1 | 0.0002 | 0.0001 | -0.0003 | -0.0000 | -0.0462*** |
| | (0.0006) | (0.0006) | (0.0008) | (0.0008) | (0.0104) |
| | | | | | |
| Control variables | Yes | Yes | Yes | Yes | Yes |
| Year FE | No | Yes | No | Yes | |
| Country FE | No | No | Yes | Yes | |
| Prob > F | 0.0033 | 0.0000 | 0.0000 | 0.0000 | |
| R2 | 0.0090 | 0.0682 | 0.1179 | 0.1662 | |
| AR (1) Test, P-value | | | | | 0.062 |
| AR (2) Test, P-value | | | | | 0.102 |
| Hansen Test, P-value | | | | | 0.333 |
| Groups | 44 | 44 | 44 | 44 | 44 |
| Observations | 1936 | 1936 | 1936 | 1936 | 1936 |

*Notes:* This table presents estimates of the effect of remittances on the change in unemployment. Lagged variables of logarithms of Primary school enrollment, Secondary school enrollment, Trade, GDP per capita, Urbanization, and Active population are controls of the models estimated. Columns (1–4) present results of least squares estimation with robust standard errors in parentheses. Column (5) presents results of system GMM estimation. AR (1) and AR (2) are first and second order serial correlation tests, respectively. The Hansen test is a test of instrument relevance. ***, ** and * denote significance at the 1, 5, and 10% level, respectively.

Table 4 reports OLS and system-GMM estimates of the effect of remittances on wage and salaried work. Unlike the OLS results in columns (1-4), which suggest that the effect is negative and significant, the system-GMM results (Column 5) indicates that remittances have a negative but non-significant effect on wage and salaried work.

### Table 4. Remittances and change in wage and salaried work

| | Δshare of wage & salaried workers | | | | |
| --- | --- | --- | --- | --- | --- |
| | (1) OLS | (2) OLS | (3) OLS | (4) OLS | (5) Sys-GMM |
| Log Wage and Salaried, t - 1 | 0.0082 | 0.02992** | 0.0692 | 0.0727 | 0.1311*** |
| | (0.0110) | (0.0132) | (0.0508) | (0.0536) | (0.0213) |
| Remittances, t - 1 | -0.0034** | -0.0035** | -0.0071*** | -0.0072*** | -0.0256 |
| | (0.0014) | (0.0013) | (0.0010) | (0.0000) | (0.1898) |
| | | | | | |
| Control variables | Yes | Yes | Yes | Yes | Yes |
| Year FE | No | Yes | No | Yes | |
| Country FE | No | No | Yes | Yes | |
| Prob > F | 0.0000 | 0.0000 | 0.0000 | 0.0000 | |
| R2 | 0.0316 | 0.0720 | 0.2763 | 0.3069 | |
| AR (1) Test, P-value | | | | | 0.174 |
| AR (2) Test, P-value | | | | | 0.346 |
| Hansen Test, P-value | | | | | 0.847 |
| Groups | 44 | 44 | 44 | 44 | 44 |
| Observations | 1936 | 1936 | 1936 | 1936 | 1936 |

*Notes:* This table presents estimates of the effect of remittances on the change in wage and salaried work. Lagged variables of logarithms of Primary school enrollment, Secondary school enrollment, Trade, GDP per capita, Urbanization, and Active population are controls of the models estimated. Columns (1–4) present results of least squares estimation with robust standard errors in parentheses. Column (5) presents results of system GMM estimation. AR (1) and AR (2) are first and second order serial correlation tests, respectively. The Hansen test is a test of instrument relevance. ***, ** and * denote significance at the 1, 5, and 10% level, respectively.

Table 5 presents estimates of the effect of remittances on self-employment. Regardless of the specification and the estimator used, the estimated coefficient for remittances is positive and significant at the 1 percent level. The magnitude of the coefficient is substantially higher when endogeneity bias is addressed. These estimates show that remittances have a strong, significant, and positive effect on self-employment in SSA countries. This finding is in line with related evidence from Amuedo-Dorantes and Pozo (2006), Ashby and Seck (2012) and Shapiro and Mandelman (2016) that remittances tend to promote small-scale entrepreneurial activities by relaxing liquidity constraints. Indeed, self-employment is often a partial income protection strategy in SSA countries, where social safety nets are either limited or non-existent (Shapiro and Mandelman, 2016). In this context, remittance inflows can be used to finance the startup and operating costs of microenterprises.

**Table 5. Remittances and change in self-employment**

| | ΔSelf-employment | | | | |
|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) |
| | OLS | OLS | OLS | OLS | Sys-GMM |
| Log Self-employment, t - 1 | -0.1030*** | -0.0717** | -0.2242 | -0.2038 | 8.6631*** |
| | (0.0285) | (0.0313) | (0.2357) | (0.2324) | (1.9353) |
| Remittances, t - 1 | 0.0034** | 0.0033** | 0.0065*** | 0.0067*** | 0.1077*** |
| | (0.0015) | (0.0014) | (0.0009) | (0.0009) | (0.0333) |
| Control variables | Yes | Yes | Yes | Yes | Yes |
| Year FE | No | Yes | No | Yes | |
| Country FE | No | No | Yes | Yes | |
| Prob > F | 0.0000 | 0.0000 | 0.0000 | 0.0000 | |
| R2 | 0.0374 | 0.0730 | 0.2752 | 0.3427 | |
| AR (1) Test, P-value | | | | | 0.423 |
| AR (2) Test, P-value | | | | | 0.334 |
| Hansen Test, P-value | | | | | 0.549 |
| Groups | 44 | 44 | 44 | 44 | 44 |
| Observations | 1936 | 1936 | 1936 | 1936 | 1936 |

*Notes:* This table presents estimates of the effect of remittances on the change in self-employment. Lagged variables of logarithms of Primary school enrollment, Secondary school enrollment, Trade, GDP per capita, Urbanization, and Active population are controls of the models estimated. Columns (1–4) present results of least squares estimation with robust standard errors in parentheses. Column (5) presents results of system GMM estimation. AR (1) and AR (2) are first and second order serial correlation tests, respectively. The Hansen test is a test of instrument relevance. ***, ** and * denote significance at the 1, 5, and 10% level, respectively.

# 6. Robustness checks

The results in the preceding section indicate that remittances significantly increase labor force participation and self-employment rates and significantly reduce unemployment, but do not have a significant effect on wage and salaried work. In this section, I check the robustness of the baseline estimates using a different measure of remittances. This is because the ratio of remittances to GDP is sensitive to changes in GDP as well as in remittances, making it difficult to isolate the true effect of remittances on labor market outcomes (Williams, 2017). I therefore use remittance per capita instead of the ratio of remittances to GDP as a robustness check to determine whether the baseline results are affected by the choice of remittance measure.

Table 6 reports the system-GMM estimates of the average effect of remittances per capita on the previously considered labor market outcomes. I use a dynamic system-GMM estimator with remittances treated as endogenous and instrumented with their own lags, and all covariates and the lagged dependent variable included as controls in the model. Regarding the effect of remittances on labor force participation (column (1)), although the estimated coefficient remains positive, the effect is not significant, in contrast with the baseline system-GMM results. The results in column (2) for the effect of remittances on unemployment show that the estimated coefficient is negative and significant (−0.0197), in agreement with the baseline results, but of lower magnitude. The effect of remittances on the proportion of wage and salaried workers (column (3)), remains negative and non-significant as in the baseline results. In column (4) finally, the estimated coefficient for the

effect of remittances on self-employment is positive and statistically significant at the 1 percent level, in agreement with the baseline results. Overall, these findings suggest that remittances encourage workers in SSA countries to move from underemployment to self-employment without increasing labor force participation or the share of wage and salaried workers.

### Table 6. Remittances and change in labor market outcomes

| Dependent variables: | ΔLabor force participation | ΔUnemployment | ΔWage and salaried workers | ΔSelf-employment |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| | Sys-GMM | Sys-GMM | Sys-GMM | Sys-GMM |
| Log Labor force participation, t - 1 | -11.7432*** | | | |
| | (4.1427) | | | |
| Log Underemployment, t-1 | | -3.0440*** | | |
| | | (0.0331) | | |
| Log Wage and salaried workers, t-1 | | | 0.1399*** | |
| | | | (0.0195) | |
| Log Self-employment, t-1 | | | | 8.0216*** |
| | | | | (1.8323) |
| Remittances per capita, t - 1 | 0.0003 | -0.0197*** | -0.0034 | 0.0246*** |
| | (0.0027) | (0.0008) | (0.0013) | (0.0028) |
| | | | | |
| Control variables | Yes | Yes | Yes | Yes |
| AR (1) Test, P-value | 0.041 | 0.603 | 0.162 | 0.536 |
| AR (2) Test, P-value | 0.380 | 0.306 | 0.325 | 0.159 |
| Hansen Test, P-value | 0.587 | 0.206 | 0.915 | 0.756 |
| Groups | 44 | 44 | 44 | 44 |
| Observations | 1936 | 1936 | 1936 | 1936 |

*Notes:* This table presents estimates of the effect of remittances on four labor market outcomes using system-GMM estimation. Lagged variables of logarithms of Primary school enrollment, Secondary school enrollment, Trade, GDP per capita, Urbanization, Active population are controls of the models estimated. AR (1) and AR (2) are first and second order serial correlation tests, respectively. The Hansen test is a test of instrument relevance. ***, ** and * denote significance at the 1, 5, and 10% level, respectively

# 7. Conclusion

Because of their persistence and volume, international remittances remain an important issue for researchers and policymakers in SSA countries. In this paper, I estimated the effects they had on labor market outcomes in Sub-Saharan Africa over the period 1975–2019. The indicators retained to capture labor market outcomes were the rates of labor force participation, unemployment, self-employment and wage and salaried work. I used OLS regression for baseline estimates, including year and country fixed effects, and dynamic system GMM estimation to correct for endogeneity bias, with some of the estimated effects of remittances remaining of the same sign and level of significance, others not. The baseline system-GMM estimates indicate that remittance flows significantly affect labor market outcomes in sub-Saharan Africa, significantly increasing labor force participation rates and self-employment rates and significantly reducing unemployment. However, the only effects that remained significant in robustness checks, were those on unemployment and self-employment. As measured here, the overall effect of remittances on labor market outcomes in SSA countries is therefore positive. It is as if remittances allow workers in SSA countries to move from underemployment to self-employment without improving labor force participation or the share of wage and salaried workers. Reforms aiming to foster productive employment in SSA countries need to account for the benefits of remittances to be successful.

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# Appendix

## Table A1. Description of variables

| Variable | Description | Source |
|---|---|---|
| Labor force participation rate | is the proportion of the population between 15 and 64 years of age that is economically active: all people who supply labor to produce goods and services during a specified period. | |
| Self-employment | Workers who, working on their own account or with one or a few partners or in a cooperative, hold the type of jobs defined as a "self-employment jobs." i.e. jobs where the remuneration is directly dependent upon the profits derived from the goods and services produced. | |
| Wage and salaried | Workers who hold the type of jobs defined as "paid employment jobs," where the incumbents hold explicit (written or oral) or implicit employment contracts that give them a basic remuneration that is not directly dependent upon the revenue of the unit for which they work. | |
| Unemployment | The share of the labor force that is without work but available for and seeking employment. | |
| Active population | The proportion of the population aged 15–64 years | WDI, 2020 |
| Primary education | The gross enrollment ratio is the ratio of total enrollment, regardless of age, to the population of the age group that officially corresponds to primary education. | |
| Secondary education | The gross enrollment ratio is the ratio of total enrollment, regardless of age, to the population of the age group that officially corresponds to secondary education. | |
| Trade | The sum of exports and imports goods and services measured as a share of domestic product | |
| Urbanization | The proportion of the population living in urban areas as defined by national statistical offices. | |
| GDP per capita | GDP per capita is gross domestic product divided by midyear population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. | |

Source: Author, based on the World Bank definition

## Table A2. Countries Included in the analysis

| | | | |
|---|---|---|---|
| Angola | Cote d'Ivoire | Lesotho | Rwanda |
| Benin | Equatorial Guinea | Liberia | Sao Tome and Principe |
| Botswana | Eritrea | Madagascar | Senegal |
| Burundi | Eswatini | Malawi | Seychelles |
| Cabo Verde | Ethiopia | Mali | South Africa |
| Cameroon | Gabon | Mauritania | Sudan |
| Central African Rep. | Gambia | Mauritius | Tanzania |
| Chad | Ghana | Mozambique | Togo |
| Comoros | Guinea | Namibia | Uganda |
| Congo Demo. Rep. | Guinea-Bissau | Niger | Zambia |
| Congo Republic | Kenya | Nigeria | Zimbabwe |

Source : Author from WDI (2020)

## Table A3.  Descriptive variables

| Variables | Observations | Mean | Standard Deviation |
|---|---|---|---|
| Remittances per capita (Constant US$) | 2025 | 21.5340 | 48.73380 |
| Remittances (% of GDP) | 2025 | 2.964006 | 8.097538 |
| ΔLabor_Force_Participation | 1980 | -0.064471 | 0.362059 |
| ΔUnemployment | 1980 | 0.036787 | 0.508413 |
| ΔWage_salaried_workers | 1980 | 0.133374 | 3976643 |
| ΔSelf-employment | 1980 | -0.133374 | 0.397643 |
| Log Labor force participation | 2025 | 4.236236 | 0.168865 |
| Log Unemployment | 2025 | 1.604039 | 0.959435 |
| Log Wage and salaried workers | 2025 | 2.962272 | 0.797221 |
| Log Self-employment | 2025 | 4.233713 | 0.410419 |
| Log Primary | 2025 | 4.359478 | 0.476742 |
| Log Secondary | 2025 | 3.116064 | 0.807402 |
| Log Trade | 1980 | 4.177823 | 1.117211 |
| Log GDPCapita | 2025 | 6.412624 | 1.181641 |
| Log Urbanization | 2025 | 3.545223 | 0.596827 |
| Log Active population | 2025 | 14.93184 | 1.467779 |

Source: Author from WDI (2020)