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REGULAR ARTICLE

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Impact of remittances on male and female labor force participation patterns in Africa: Quasi-experimental evidence from Ghana

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Abstract

In this paper, we examine how remittances, an outcome of labor mobility, affect labor market activities in Ghana using detailed household and individual-level data. This is important, considering the extensive literature that has documented the remittance–poverty reduction nexus. First, we find a strong negative association between household remittance-receiving status and individual labor supply decisions using instrumental variable estimation techniques. Second, we find the depressing effect of remittances on labor supply decisions to be much stronger in rural areas. Rural women who reside in remittance-receiving households are less likely to be in the labor force compared with those who do not reside in such households. Remittances have very little impact on labor supply decisions in urban areas. Our findings support that remittances can exacerbate long-term poverty reduction in rural areas through lower labor force participation, and as such rural-based and gender-based interventions may be needed to help redirect remittance income.

KEYWORDS

labor markets, quasi-experiment, remittances, reservation wage, rural women, rural men, Ghana, sub-Saharan Africa

JEL CLASSIFICATION
D9; D10; F22; F24

1 | INTRODUCTION

Migration within and from and remittances in and into sub-Saharan Africa have increased considerably in the past few decades (see Ratha, 2005; Teye et al., 2019). Thus, although the amount of external financial flows to sub-Saharan Africa has declined over the past decade—partly due to the instability in the global financial environment—personal remittances to sub-Saharan Africa continue to increase (Lubambu, 2014; Ratha, 2005). For example, the average amount of international remittances to Ghana from 1979 to 1990 was approximately US$2.8 million (World Bank Indicators, 2017). Two decades later, remittances to Ghana increased to about US$135 million in 2010 and US$2.1 billion in 2014. Empirical evidence on the impact of remittances in countries such as Mexico and Haiti shows that remittances tend to depress labor supply of household members left behind, with differential consequences for male and female labor supply (see Amuedo-Dorantes & Pozo, 2006; Jadotte, 2009). Aside the evidence on Egypt from a study carried out by Binzel and Assaad (2011), only limited analyses have been carried out on how male and female labor supply responds to remittances in sub-Saharan Africa are available. It is important to note that lower labor force participation can impact the overall economic growth of the country.

Many studies that use household surveys have shown that only about half of all international migrants remit (De la Briere, Sadoulet, De Janvry, & Lambert, 2002; Gubert, 2002), whereas other studies show that many households receive remittances without having any migrant household member abroad (Adams & Page, 2005; Amuedo-Dorantes & Pozo, 2010). While these studies argue that households having no international migrants can receive remittances from relatives and friends, it is obvious that in an environment of high internal migration, as in many African countries, considering the impact of international migration and remittances alone may be incomplete. Therefore, in this study, we examine the impact of total remittances on households. For Ghana, Teye et al. (2019), drawing on a panel of households without any migrant household member in 2015 and following these households over 3 years, find that the migration status of 49% of the households had changed. Precisely, 37.2% of the households that did not have a migrant reported having internal migrants, and 2% of the households reported having international migrants by 2018. About 6.8% of the households reported having a returned internal migrant and 0.7% had returned international migrants within the 3-year period. This buttresses our point that any analyses of the impact of remittances on household left behind in sub-Saharan Africa and particularly Ghana should be holistic, considering the impact of total migration and remittances.

We draw on the cross-sectional data from the Ghana Living Standards Survey (GLSS, 2012/2013) to explore the impact of remittances on the labor participation behavior of household members left behind. In this survey, 1,200 neighborhoods or clusters were selected as primary sampling units (PSUs), covering 16,772 households containing 72,372 individuals. We address the endogeneity of remittance or living in a remittance-receiving household using instrumental variable (IV) estimation. We instrument being in a remittance-receiving household with information on the degree of mobile phone ownership among households within the neighborhood of the individual. This instrument captures the extent of remittance-related networks in the community, which increases the opportunity to receive mobile money even if the household does not own a mobile phone or does not have a mobile money account on its phone. Migration scholars argue that advances made in the information and communication technology have resulted in an increased flow of people, goods, money, and ideas (see Schiller,

Basch, & Blanc, 1995; Mazzucato, van den Boom, & Nsowah-Nuamah, 2005). Thus, the use of mobile phone within neighborhoods as an instrument for remittances, as done in this study, is supported strongly by papers on migration.

The impact of remittances on labor supply decisions and other labor market outcomes has been examined for many countries. Several studies—such as Amuedo-Dorantes and Pozo (2006), Hanson (2007), Airola (2008), Cox-Edwards and Rodriguez-Oreggia (2009), and Taylor and Lopez-Feldman (2010)—have examined the impact of international remittances on labor force participation and hours of work in Mexico. Jadotte (2009) and Mendola and Carletto (2012) offer evidence for Haiti and Albania, respectively. Kim (2007) studies the issue for Jamaica, while without controlling for the endogeneity of remittances Rodriguez and Tiongson (2001) and Funkhouser (1992) examine those for Manila and Managua in the Philippines, respectively. For entire Africa, the study by Binzel and Assaad (2011), which examines the effect of Egyptian men working abroad on women left behind, represents one of the most important country-specific studies on the issue in an African country. Thus, remittances adversely impact the employment of certain groups within the studied countries. A macrolevel analysis on the issue by Posso (2012) finds a positive and significant relationship between remittances and aggregate labor supply for men but insignificant impact on women.

However, evidence on the issue is relatively scanty for sub-Saharan Africa. Although the sample used by Posso (2012) in the macrolevel analyses included some African countries, the study failed to present African-specific results on the relationship between remittances and labor supply. Also, the evidence from the study on a North African country such as Egypt, as studied by Binzel and Assaad (2011), cannot be readily generalized for every African country, particularly sub-Saharan African countries. Thus, even outside the study by Binzel and Assaad (2011) in Egypt, for many African countries, very little is known empirically about the relationship between remittances and labor supply. Knowing how remittances impact labor force participation in sub-Saharan Africa is crucial for such countries to restructure policies and interventions to drive the greater impact of remittance receipts on the local economy.

We find from our estimations that at the pooled level, individuals who reside in remittance-receiving households are significantly less likely to be in the labor force. We find that the depressing effect of remittance on labor market participation in Ghana is driven by the rural dummy. Precisely, residents in rural areas are negatively impacted by remittances. Although Cox-Edwards and Rodríguez-Oreggia (2009) find no effect of remittances for Mexico but Amuedo-Dorantes and Pozo (2006) find that the overall female labor supply appears to decrease due to changes in remittance in Mexico, we do not find significant differences in impact across gender. Men and women are equally impacted by remittances. Thus, within rural and urban areas, we do not find gender differences in labor force participation and hours of work. Rural women who dwell in remittance-recipient households are less likely to be in the labor force compared with those in nonrecipient households. We do not find similar results for rural men, urban women, and urban men.

This study is significant in two principal ways. This study does fill an important gap in empirical research on the impact of remittances on labor market outcomes in sub-Saharan Africa. It guides development practitioners interested in reducing rural poverty to explore ways to harness remittances for employment creation and labor participation. The depressing effect of remittances in rural areas is obviously due to the lower economic opportunities in such areas of Africa. Therefore, a policy may be needed to direct incentivizing migrants to invest directly in their villages to expand employment opportunities for their people. Using this approach, sustainable employment opportunities can be created rather than hoping that rural recipients of remittance can invest such small amounts to avoid poverty.

The rest of the paper is structured as follows. Section 2 presents related literature. Section 3 briefly discusses the theoretical connection between remittances and labor force participation. Section 4

presents the data and the empirical strategy adopted for our empirical estimation. Section 5 discusses the empirical results. Finally, Section 6 provides a summary of our key findings, conclusion, and recommendations.

2 | LITERATURE REVIEW

Previous literature on the subject has examined why migrants remit to their families left behind. The reasons include the desire to help family members (Brown & Poirine, 2005; Rapoport & Docquier, 2006), provision of insurance against risks and shocks for household members left behind (Azam & Gubert, 2006; Yang & Choi, 2007), dealing with shocks such as a death in the household (Mazzucato et al., 2005), and investments to guarantee future earnings upon return (Rapoport & Docquier, 2006).

In addition to examining the drivers of remittance to households left behind, many studies have examined the impact of remittances, including the labor market effect of remittances. For example, in estimating the labor supply decisions in response to remittance income in Mexico, Airola (2008) used a Heckman selection model (Heckman, 1979) to estimate the probability of being in the workforce determined by age, education, whether the household is in a rural or urban setting, the number of children in the household, and a dummy variable indicating whether the household received remittance income. However, the endogeneity of remittance income is not addressed in this study.

A similar exercise carried out by Rodriguez and Tiongson (2001) in Manila and Funkhouser (1992) in Managua did not attempt to control for endogeneity in the household receipt of remittances. In both studies, without addressing selectivity, they conclude that remittances reduce employment and hours of work.

To estimate the effect of remittance income on household labor supply, attempts must be made to mitigate issues of endogeneity, or selection. First, remittances are not sent randomly to households, and therefore remittance-receiving households are different from nonreceiving household (Airola, 2008). Importantly, if the remitter sends money in response to a certain observable characteristic, the remittance income will be endogenous to the labor supply decision.

One way to address the endogeneity problem regarding remittances is to use IV techniques. Many studies on the topic have used IV estimations. While natural experiments offer convincing means for overcoming many of the methodological problems in remittance impact studies, it is important to note that the impossibility of randomizing remittances and the limitations of experiments that rely on remittance instruments are based on temporal household shocks. As argued by Adams and Cuecuecha (2013), the results of shock-based IV studies do not show the average impact of remittances in a population.

The most closely related study on the labor market impact of remittance with an emphasis on male and female labor employment is the study by Amuedo-Dorantes and Pozo (2006) in Mexico. In this study, the authors instrumented remittances with information on the per capita count of Western Union offices in the state and, following Hanson and Woodruff (2003), interacted the instrument with the percentage of household members with secondary education and those with postsecondary education, to allow for the variability of the instrument at the household level. The authors find that the overall female labor supply appears to decrease due to changes in remittance income although this is so only in the rural areas of Mexico, whereas the overall male labor supply does not vary because of changes in the remittance income.

Following a quite similar estimation approach used by Amuedo-Dorantes and Pozo (2006), Jadotte (2009) finds contrary results in a study on labor market effects of remittances in Haiti. This study finds that the impact of international remittances does not seem to be important in determining the labor

participation behavior particularly for women in Haitian recipient households. In Albania, Mendola and Carletto (2012) on the impact of migration find results that are consistent with the findings of Jadotte (2009). Precisely, using the 2005 Albania Living Standards Measurement Study survey, the study shows that having a migrant abroad decreases female labor supply but not male labor supply.

Despite the international rhetoric on the exodus of Africans to the West, the data show high levels of internal migration in Africa (see Awumbila & Ardayfio-Schandorf, 2008; Castaldo, Deshingkar, & McKay, 2012; Teye et al., 2019). Teye et al. (2019) followed a pool of households without migrants from 2015 through 2018 in Ghana and found that 37.2% had internal migrants whereas only 2% had international migrants by 2018. The result of examining international remittance impacts by instrumenting with Western Union offices as done by Amuedo-Dorantes and Pozo (2006) in Mexico will not be the same as that done by a similar study in Africa because of the high level of internal migration and remittances in Africa. As a result, we examine the impact of total remittances on labor market effects without separating internal from international remittances. We do not have good priors to expect the impact of remittances on labor market outcomes to differ depending on whether the amount received is from internal or international sources. Thus, while Amuedo-Dorantes and Pozo (2006) examine whether employment status and hours worked by men and women vary owing to international remittances, we examine the effect of total remittances on labor market outcomes. Also, a majority of internal remittances in Africa are done via mobile money, and therefore using the location of Western Union offices as an instrument for remittances in Africa in the presence of high mobile phone and mobile money penetration will be unrealistic. The intensity of internal migration and remittances in Africa, however, poses challenges for estimating the impact of remittances in a similar way.

While a few studies have investigated the impact of remittances in Africa, many of them have been limited by the data. For example, using a small survey of rural households from Mali, Gubert (2002) analyzes the reasons for remittance for both internal and international migrants. The main finding is that remittances are used to insure households against adverse shocks in that when there is a reduction in crop output coupled with death in the household, remittances increase. Osili (2004), using the data on Nigeria, examines how international migrants invest remittances in housing back home. The study finds that international migrants with more income are more likely to send remittances back home to invest in the housing market. The studies by Gubert (2002) and Osili (2004) on Africa rely on simple probit models, which do not control for selection in the receipt of remittances by the households left behind.

A closely related study on the labor market effect of migration and remittances in Africa is the study by Binzel and Assaad (2011) that examines the effect of Egyptian men working abroad on women left behind. Using a cross-sectional data and estimating four alternative models with two using non-IV methods that simply assume that selection into migration depends only on observables and include simple parametric regressions (probit and tobit) with migration status entered as a dummy together with several other controls they find similar results across all four models. Precisely, they find a decrease in wage work particularly in urban areas for households affected by male migration. However, women living in rural areas and affected by migration are much more likely to be employed in nonwage activities (i.e., unpaid family work) and subsistence work compared with women in nonmigrant households.

In terms of the issue of whether employment status and hours worked by men and women vary owing to remittances, to our knowledge, the study by Binzel and Assaad (2011) is one of the first quantitative studies on this issue for a country in Africa. For sub-Saharan Africa, very little rigorous empirical analysis has been carried out. To the best of our knowledge, this is one of the first rigorous quantitative country-specific studies on this issue for a country in the sub-Saharan African region. We use IV techniques for this purpose.

TABLE 1 Remittance flows to Africa relative to the global trend

	2010 (000,000)	2011 (000,000)	2012 (000,000)	2013 (000,000)	2014 (000,000)	2015 (000,000)
Ghana	135	2,134	2,155	1,863	2,007	4,982
SSA	31,265	35,761	36,246	36,366	36,944	39,713
Africa	52,433	59,581	64,461	63,580	67,256	67,377
World	417,482	469,654	494,900	522,514	552,049	552,317

Abbreviation: SSA, sub-Saharan Africa.

Source: World Bank Indicators (2017).

In Africa, total remittance receipts as of 2015 stood at 11.2% of the total global remittance flows. Since 2010, remittance flows to Africa have been increasing generally, except in 2013 when there was about 1.37% decline over the inflows in 2012 but resumed an upward trajectory from 2014. The continental picture is reflected in countries within the subregion and in Ghana, the country of focus for this study (see Table 1, Figures 1 and 2 for details).

In Ghana, official development assistance (ODA) and official aid were higher than foreign direct investments (FDI) and remittances from 1990 until around 2006 when they both fell below FDI and remittances (Figure 2). The reason for the decline in ODA and official aid is that Ghana attained a middle-income status and donors began to reduce their official aid support. Between 2014 and 2015, Ghana recorded around 148% increase in total remittance receipts over the period (World Bank Indicators, 2017). The increase in volume and stability in remittances and the fact that Ghana is the second-largest recipient of remittances receipt in the subregion makes it a very important country in the remittance ecosystem in the region.

3 | THEORETICAL ISSUES

This section introduces the neoclassical model of labor supply. The model explains labor supply decisions by analyzing the variables that determine whether an individual will choose work (market work) or leisure (nonmarket activities). Thus, individuals allocate time to work and leisure, maximizing utility subject to a budget constraint. This budget constraint is conditional on the individual's market wage, the time budget, and nonlabor income (see Adams & Cuecuecha, 2013; Amuedo-Dorantes

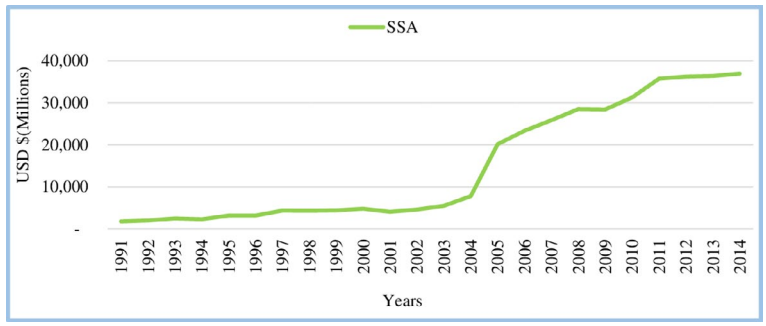

FIGURE 1 Remittance flows to sub-Saharan Africa

Source: Constructed from World Bank Indicators (2017). [Colour figure can be viewed at wileyonlinelibrary.com]

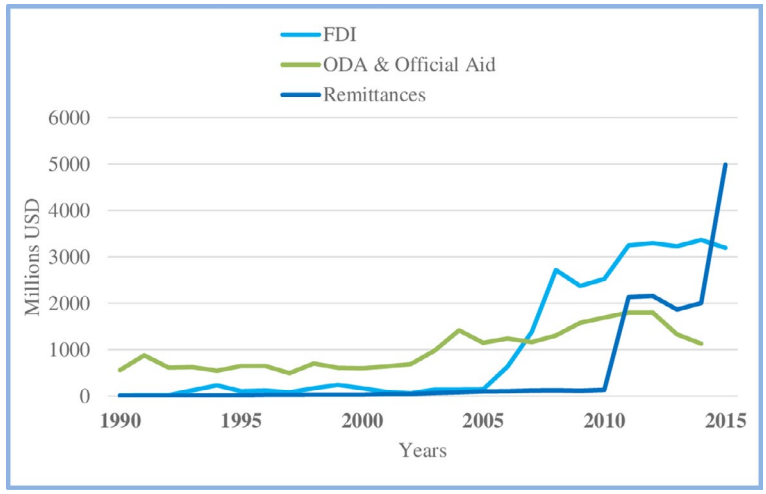

FIGURE 2 External flows to Ghana

Source: Constructed from World Bank Indicators (2017). [Colour figure can be viewed at wileyonlinelibrary.com]

& Pozo, 2012; Cox-Edwards & Rodríguez-Oreggia, 2009). In this utility-maximizing framework, a positive lump sum income transfer such as remittances should result in a wealth or income effect leading to a reduction in labor supply (Killingsworth, 1983). Precisely, if an individual depends solely on work income to purchase desired goods and services (zero nonlabor income), such an individual will have zero consumption of goods and services if he or she decides not to work. Therefore, an increase in the individual's nonlabor income through the receipt of remittances will always relax the budget constraint, allowing him or her to reduce labor force participation or the number of hours of work.

The model, therefore, identifies wage and nonwage income as key economic variables that determine the decision to work or not and the number of hours to work. Consistent with the neoclassical model, Azam and Gubert (2006) argue that the insurance system provided to household members left behind by remittance income involves some moral hazard, as those remaining behind tend to make less effort to take care of themselves, knowing that the migrants will compensate any shortfall in welfare with a high probability (Azam & Gubert, 2006). The neoclassical model is adapted in this study with undertones from the segmented market theory to explain the labor supply decisions of men and women.

For those who may be interested, we formally present the neoclassical model with the modification that allows us to explore the differential impact of remittances on the labor supply decisions of men and women. From the neoclassical model, the maximization of utility by an individual is subject to three important constraints: wage income, nonwage income, and leisure time. If an individual's utility is given by u, whereas consumption and leisure are denoted by c and l, respectively, then the utility of a typical person can be represented by

$$u = f\ (c,l)\,. \tag{1}$$

From Equation 1, the representative individual can decide to spend his or her time on activities that can lead to the attainment of higher consumption levels or, depending on preferences for leisure, spend his or her time on leisure activities. The individual can choose different combinations of consumption and leisure that will yield the same desired utility. Implicit in this relationship is the substitution between consumption and leisure as wage increases. With the introduction of remittances, any possible

substitution effect toward work driven by changes in work income becomes weak if the income effect emanating from remittance receipts is much stronger. Thus, the consumption constraint is relaxed with the introduction of remittance income, and the extent of relaxation of the consumption constraint depends on the amount of remittance income received. In the absence of large income effect from remittances, the neoclassical model of labor supply will predict no significant effect of remittances on labor force participation.

To see this, the consumption constraint of the typical person can be represented as

$$c = wh + r, \tag{2}$$

where w is the wage, r is the remittance income, and h is the number of hours a person allocates to labor market activities. If T is the total time available to the individual and l is the time allocated to leisure activities, then Equation 2 can be rewritten as

$$c = w(T - l) + r. \tag{3}$$

Reorganizing Equation 3 yields

$$c = (wT - wl) + r \tag{4}$$

or

$$c = (wT + r) - wl. \tag{5}$$

From Equation 5, if remittance r is very high, consumption can be high even when total time available to the individual is allocated to leisure activities. Thus, higher remittances income will increase reservation wage and reduce the motivation to stay or remain in the labor force.

We modify the neoclassical framework by introducing a reference or target consumption level. The reference consumption level can be considered akin to the "safe minimum standard" in the development economics literature, and this relates the amount of money a household needs to avoid absolute poverty (see Bishop, 1978; Crowards, 1998, with applications to the environment). In a developing country setting, where the labor market is loose, labor supply may be more reference-dependent than its sensitivity to reservation wage. Building on the theory of reference-dependent preferences by Farber's (2005, 2008), the individual can be thought of as having a reference consumption level, and therefore the attainment of such reference consumption point—or exceeding it—with remittance income will discourage the representative individual from entering or staying in the labor force. Equation 5 can therefore be rewritten as

$$\tilde{c} \leq r, \tag{6}$$

where total time (T) is spent on leisure activities ($T = L$) and $\tilde{c}$ is the reference consumption level. Note, however, that we make an important assumption to the effect that individuals care only about consumption. In societies in which stigma is attached to unemployment, a remittance-receiving individual will still work or at least actively seek work even if he or she receives huge remittance income. In Ghana, at the time of the survey, the national poverty line was GHS1,314.0 per adult equivalent per year, whereas extreme poverty was pegged at GHS792.2 per adult equivalent per year (based on the GLSS6 2012/2013 poverty report). In the empirical analysis that follows, we control for the level of nonremittance household income in the labor supply model. Thus, we control for whether an individual

TABLE 2 Reference-dependent preferences and labor supply decisions

Stay in labor force	Stay out of labor force	Stay in labor force (expectations, unstable r)
$\tilde{c} > r$	$\tilde{c} < r$	$\tilde{c} < r$
$\tilde{c} = r$	$\tilde{c} = r$	$\tilde{c} = r$
$\tilde{c} = r + wT$		
$\tilde{c} > r + wT$		

resides in a household that has a nonremittance income level that is above the "safe minimum," that is, the poverty line.

For our second question, which is based on whether the effect of remittances varies across locations in Africa, we rely on the segmented market theory (dual labor markets). If the labor market is segmented between urban and rural with rural areas having low wages, then one will expect differences in the wage elasticity of hour of work, and therefore the income effect of remittances will tend to be stronger in settings where the wage elasticity is relatively small (see Botelho & Ponczek, 2011; Leontaridi, 1998). Table 2 presents the optimal labor force participation decision facing a typical individual amid remittance income and in settings where differences exist in the wage elasticity of hours of work.

From Table 2, there are two conditions under which an individual who resides in a remittance-receiving household will opt out of the labor force: (1) when remittance income exceeds household reference consumption and (2) when the remittance is at least equal to reference consumption. The wage elasticity of hours of work, which may be different for different groups, is captured by w. In the long run, households will form expectations about r (even when the current level of r is higher than $\tilde{c}$), and if future r is unstable or is expected to reduce, households will invest part of their r today to ensure continuous labor force participation. The multiple equilibria, therefore, will lead to different impacts of remittances across different countries. In our IV regressions, we control for whether the individual resides in below the "safe minimum" household.

4 | DATA AND EMPIRICAL STRATEGY

We do ask a very simple question: Does it matter if your household receives remittances? To answer this question, we used a nationally representative survey of 16,772 households and 72,372 individual observations from Ghana. To be more specific, we used the detailed 2012/2013 GLSS6 to quantify the effect of receiving remittances in Ghana on labor supply. The survey covered a nationally representative sample of 18,000 households in 1,200 enumeration areas (EAs). Of the 18,000 households, 16,772 were successfully enumerated leading to a response rate of 93.2%. Precisely, a two-stage stratified sampling design was adopted. At the first stage, 1,200 EAs were selected to form the PSUs. The PSUs were allocated into the 10 regions using probability proportional to population size. The EAs were further divided into urban and rural localities of residence. A complete listing of households in the selected PSUs was undertaken to form the secondary sampling units. At the second stage, 15 households from each PSU were selected systematically. Therefore, the total sample size had 18,000 households nationwide. Mobile phone ownership in these 15 households was used to construct our remittance instrument.

The two key important modules in the questionnaire that we rely on for our empirical exercise are the migration and labor market modules. The key question of concern to this study, which is captured

in the questionnaire under the migration module, is whether the individual (in a remittance-receiving household or a nonremittance household) worked in the past 7 days for wage/or salary or in-kind payments for more than 1 h, and from the remittance module, whether the individual lived in a household that received remittance in the past 1 year. One could argue that using the "1-h-a-week" criterion for employment could underestimate the effect of receiving remittance income. This variable is coded 1 if an individual worked 1 h in the past 7 days, and 0 otherwise. We must agree that the effect of remittances on underemployment (<35 hr a week) could be different.

As indicated, the survey data cover 16,772 households and 72,372 individuals, but our empirical analysis focuses on the working-age population (18–60 years), thus reducing the observations under analysis to 33,778 individuals within the working-age group. Our sample consisted of 18,192 working-age women (53.9%) and 15,586 working-age men (46.1%). A total of 19,662 (58.2%) of the working-age population reside in rural areas, whereas 14,116 (41.8%) reside in urban areas. In rural areas, women constitute 53.3%, whereas in urban areas they constitute 54.7%. Descriptive statistics for individuals who reside in remittance-receiving and nonremittance-receiving households are presented in Table 3.

An examination of Table 3 indicates that nonremittance-receiving households have a bigger household size compared with remittance-receiving households. There seem to be more males in nonremittance households compared with remittance-receiving households. In terms of migration status of the households in which the individual resides, 20% of individuals who reside in nonremittance households have indicated having a migrant household member. This contrasts with 12% of individuals who reside in remittance-receiving households. This evidence is consistent with the findings that only about half of the migrant households receive remittances (see De la Briere et al., 2002; Gubert, 2002).

Interestingly, more individuals in nonremittance-receiving households indicated having some migrants than individuals in remittance-receiving households. No differences in spouse migration are found between remittance-receiving and nonremittance-receiving households. In both remittance and nonremittance households, there are more male household heads than female household heads. Although over 70% of the household's individuals reside in households headed by males, there are

TABLE 3 Summary statistics for the outcome and explanatory variables

		Mean			
Variable	**Obs.**	**Nonrecipients**	**Recipients**	**Diff.**	***t*-stats.**
Household size	33,778	5.556	5.485	0.071*	1.821
Male	33,778	0.477	0.428	0.049***	8.261
Urban dummy	33,778	0.424	0.411	0.013**	2.213
Migrant	33,778	0.020	0.012	0.008***	5.096
Education expenditure	33,778	975.429	982.499	−7.070	−0.289
Migrant spouse	33,778	0.002	0.002	0.001	1.247
Migrant son	33,778	0.025	0.014	0.010***	4.197
Household head sex	33,778	0.825	0.707	0.117***	24.380
Morbidity	33,778	0.145	0.220	−0.075***	−16.941
District	33,778	8.809	9.174	−0.365*	−5.414
Age 18–60	33,778	34.255	34.319	−0.064	−0.459
Household head	33,778	0.407	0.385	0.006***	0.000
Economic status	33,778	0.401	0.423	−0.022***	−3.771

TABLE 4 Use of remittance income (%) by location

Type	Rural	Urban	Total
Daily consumption	38.7	50.3	89.0
Housing	0.6	0.7	1.3
Business	0.7	1.6	2.3
Education	1.0	1.2	2.2
Health	0.8	1.7	2.5
Funerals	0.2	0.6	0.8
Other ceremonies	0.3	0.6	0.9
Savings	0.2	0.0	0.2
Other	0.2	0.7	0.9
Total	42.7	57.3	100.0

slightly more nonremittance-receiving households headed by males than remittance-receiving households. Precisely, 82.5% of nonremittance-receiving households and 71% of remittance-receiving households are headed by males.

Individuals who received remittances were slightly more likely to have recorded morbidity or sickness in the past 2 weeks preceding the interview. The average age of individuals in both remittance-receiving and nonreceiving households is approximately 34 years. Approximately, 40% of the individuals in our sample are household heads.

Table 4 highlights how remittance income is spent by rural and urban households in Ghana. As shown in Table 4, remittance income in Ghana is generally used to support consumption expenditure. In particular, consumption alone accounts for almost 90% of remittance use, whereas about 10% of remittances are used for investment in housing, business enterprise development, education, health, and savings. Thus, contrary to the study by Funkhouser (1992) in Nicaragua and Blanchflower and Oswald (1998) in various countries, in which they find that remittance income and gifts were used to start up self-businesses, less than 1% of remittance income is invested into small business creation in Ghana. Also, rural folks are slightly more likely to save some portion of their remittance income than urban dwellers. Rural households save 0.2% of remittances, whereas urban households save none or very little. This could be due to the relatively high cost of living in urban areas. Interestingly, 1.7% of remittance receipts in Ghana go to funerals (or burial) and other ceremonies.

For our empirical strategy, using a series of estimation techniques, we can estimate Equation 7:

$$\text{LaborSupply}_i = \beta_1 \text{Remit}_i + \beta_2 \text{Migrant}_i + \beta_1 \text{Urban}_i + \gamma Z_i + \varepsilon_i, \tag{7}$$

where i represents each individual above the working age of 18 years; LaborSupply denotes labor participation or hours of work; Remit is a dummy that represents whether the individual resides in a remittance-receiving household; Migrant captures whether an individual resides in a household that has a migrant; Urban captures whether the individual dwells in an urban area (coded 1) or a rural area (coded 0), with this variable reflecting structural differences in employment across different locations; Z represents other individual- and household-level controls (age of the individual, gender of the household head, number of people who reside in the individual's household, individual's household expenditure on education, morbidity, or experience of sickness in the individual's household in the past 2 weeks preceding the survey, individual's relationship to migrant, the household poverty status, that is, above or below the poverty line of GHS1,314 the "safe minimum," district of residence); and ε is the error term.

We acknowledge that in estimating the causal impact of remittances on labor supply, impact estimates by ordinary least squares method can yield bias estimates due to possible endogeneity of remittances. Endogeneity could arise from several possible sources. First, a household's remittance-receiving status may not be random and could correlate with other household characteristics. Second, there is the possibility of reverse causality running from labor market participation to remittances receipt could impact remittance inflows into the household (pure case of reverse causality). Third, there could be other unobserved factors that may impact labor supply decisions as well as the remittance-receiving status of the household in which the individual resides.

To overcome this conundrum of possible bias, we estimate IV two-stage regressions. We instrument remittance-receiving status of the household with information on the proportion of households in the individual's neighborhood/cluster that indicated owning a mobile phone. The diffusion of mobile phones in Africa has facilitated tremendously the transfer of funds within and across countries. Most telephone companies in Ghana, for example, provide mobile money services that allow individuals, households, and businesses to receive money from within Ghana and from abroad directly to their mobile money wallets. Therefore, households with mobile phones are more likely to have a mobile money wallet that can facilitate the receipts of remittances. Precisely, we argue that the proportion of households with mobile phones does indeed proxy the extent of remittance-recipient networks in the community. These networks will allow households that do not have mobile phones to still be able to receive remittances through their neighbors. We do not expect the share of households owning mobile phones in a neighborhood to correlate with labor supply decisions.

The IV estimators we employ are the conventional two-stage estimators. We estimate IV probit for the labor force participation outcome variable and then estimate an IV tobit for the hours of the work outcome variable, following the works of Amuedo-Dorantes and Pozo (2006) and Binzel and Assaad (2011). Because the endogenous variable—residing in a remittance-receiving household—is binary, we instrument it with a binary form of our neighborhood mobile phone ownership instrument. Following partially Binzel and Assaad (2011), we create a binary instrument from our share instrument by setting it equal to 1 for individuals who have 70% or more of neighboring households, indicating owning a mobile phone, and setting it equal to 0 otherwise. Thus, our a priori expectation is that residing in a neighborhood with 70% or more of neighboring households owning mobile phones increases the household's likelihood of receiving remittances. The exogeneity of our instrument in the two-stage IV regressions is examined.

5 | RESULTS

We now turn to the empirical analysis that examines the impact of remittance-receiving status of the household on labor supply in Ghana. The estimation results for the first stage and the main equation are presented in columns 1b and 1a of Table 5, respectively, for the labor force participation model. Columns 2b and 2a provide the estimated first stage and main results for the number of hours model. We start by discussing the IV tobit results for labor force participation. The results of the first-stage IV probit model suggest that male individuals are less likely to report that their households do receive remittances compared with female individuals. Urban residents are about 3.5% less likely to indicate that their households receive remittances. We find an interesting pattern when it comes to the effect of migration status. Individual who indicated that their household has a migrant were significantly less likely to report their households to receive remittances. Thus, having a migrant household member does not necessarily mean the household receives remittance and that households may be receiving relatively more remittances from extended family members who are not part of the immediate nuclear

TABLE 5 Impact of remittance-receiving status on labor supply decisions (coefficient estimates of the main equation)

	IV probit		IV tobit	
	Labor force participation	Remit	Hours of work	Remit
	(1a)	(1b)	(2a)	(2b)
vRemitD	−0.041** (0.018)		−282.488*** (38.386)	
vHHSize	−0.002*** (0.000)	0.002** 0.001)	16.146*** (0.309)	0.002* (0.001)
vMale	−0.002 (0.001)	−0.014** (0.005)	3.590 (1.942)	−0.015** (0.005)
vUrbanDummy	0.021*** (0.002)	−0.035*** (0.006)	23.190*** (2.169)	−0.038*** (0.006)
vMigrant	0.036*** (0.010)	−0.089* (0.037)	47.667*** (13.870)	−0.090* (0.037)
vEdu_Exp	−1.081E-06** (0.000)	0.000 (0.000)	0.0034 (0.000)	−9.27E-08 (0.000)
vMigspouse	0.016 (0.017)	0.027 (0.064)	33.215 (23.046)	0.027 (0.064)
vMigson	0.016** (0.017)	−0.008 (0.022)	9.095 (7.887)	−0.0081 (0.022)
vHH_headMale	0.015** (0.004)	−0.139*** (0.006)	35.286*** (6.105)	−0.1441*** (0.007)
vMobidity	−0.002 (0.003)	0.090*** (0.007)	29.374*** (4.276)	0.090*** (0.007)
vDistrict	0.001*** (0.000)	0.002*** (0.000)	2.974*** (0.179)	0.002*** (0.000)
EconomicStatus	0.012*** (0.002)	0.030 (0.005)	1.278 (2.293)	0.030*** (0.005)
vAge18to60	0.000** (0.000)	0.000 (0.000)	−0.130* (0.076)	0.000 (0.000)
com_mobile_group		0.074*** (0.007)		0.071*** (0.007)
Constant	0.967*** (0.011)	0.330*** (0.013)	−150.687*** (15.092)	0.321*** (0.013)
N	33,778	33,778	33,778	33,778

Note: *$p < .1$; **$p < .05$; ***$p < .01$.

family. Interestingly, while the coefficient on the migrant variable is negative in the remittance model, we find it to be positive in the labor force participation model. Thus, individuals who reported having a migrant household member tend to participate more in the labor force than those who do not. This finding could be driven by the burden of migration on the household and the fact that some households need to work to finance the migration of their immediate household members and pay back any migration-associated debt.

Other important drivers of remittance receipt as presented in column 1a include headship of household and morbidity within the household. Precisely, we find that individual who indicated that their households are headed by males are about 13.9% less likely to suggest that their households receive remittances. Thus, female-headed households are more likely than male-headed households to receive remittances. With regard to morbidity, for Ghana we find morbidity to be an important driver of remittances. Households that experienced sickness in the past 2 weeks before the survey were more likely to have a remittance-receiving status.

One of the most important coefficients in the first-stage regression is the coefficient on the instrument—the share of mobile phone–owning households in the neighborhood. As indicated earlier, the variable takes on 1 if 70% or more of the households in an individual's neighborhood have a mobile phone, and 0 otherwise. The result is fairly consistent across both the IV probit and IV tobit models. Testing the null hypothesis that the variables are exogenous using Durbin score and Wu-Hausman tests, we find the significant *p*-values for these tests which suggest that we reject the null that our variables are exogenous and therefore are appropriate to treat the remittance status of households in which individuals reside as endogenous. Now, examining our instrument, we find the coefficient on our instrument to be positive and highly significant at the 1% level. The *F*-statistic of our instrument in labor force participation model is 96, which is much larger than the minimum of the critical value of 10%. Thus, we reject the null hypothesis that our instrument is weak.

We now turn to the estimated results in column 1b. At the pooled level, we show that remittances depress labor force participation. The coefficient on the remittance variable is −0.041, which is significant at the 5% level. There are other important findings from column 1b. While residing in an urban area is negatively associated with remittances, residing in urban areas is positively associated with labor force participation. Although morbidity within the household is important for remittance receipt status of households, it has very little impact on labor force participation of individuals in the household. Overall, we find a negative relationship between remittances and labor force participation.

A similar pattern of findings is obtained for hours of work as estimated by the IV tobit model, and results are presented in columns 2a and 2b. The coefficient on the instrument in that model is also positive and highly significant at the 1% level. The *F*-statistic on the instrument is, however, slightly lower than that of the instrument under the labor force participation model. The *F*-statistic for the instrument under the hour of work is 89, but still higher than the minimum threshold of 10. The first-stage results in column 2b under the hours of work model mimic those of the labor force model. For the second-stage main model, we also find a negative association between remittances and hours of work. The coefficient on remittances is significant at the 1% level. Interestingly and consistent with the results from the labor force model, respondents with migrant household members work more hours. In a nutshell, we find that remittances reduce the labor supply of families left behind.

We now turn our attention to examining how remittances impact different subgroups. In effect, we examine whether there are heterogeneous effects of remittances across gender and location. Tables 6 and 7 present results for labor force participation and hours of work, respectively. From Table 6, we do not find a significant impact of remittances on labor force participation for women. Thus, females who reside in remittance-receiving households are not different from those who reside in nonremittance households. The coefficient on the remittance variable for this estimation is negative but not significant. The *F*-statistic for the instrument in this female-alone model is 55, which is above the minimum of 10.

Similar results are found for the male-alone sample. Even though men who live in remittance-receiving households are less likely to be involved in the labor force (−0.044), this difference is not statistically significant. The *F*-statistic for the instrument in this model was 35. What seems interesting is the effect of remittances in rural households. The labor supply of individuals in remittance-receiving

TABLE 6 Labor force participation across subsamples (marginal effects)

Subsamples	Obs.	Coef.	Std. Err.	*z*	*p* > *z*
Women	18,192	−0.039	0.036	−1.1	0.272
Men	15,586	−0.044	0.043	−1.01	0.313
Rural	19,634	−0.038**	0.016	−2.33	0.020
Urban	14,116	−0.096	0.130	−0.74	0.460
Rural women	10,382	−0.043**	0.021	−2.04	0.042
Rural men	9,190	−0.031	0.025	−1.25	0.213
Urban women	7,720	−0.063	0.178	−0.36	0.721
Urban men	6,396	−0.147	0.184	−0.80	0.426

Note: **$p < .05$.

TABLE 7 IV tobit results for the number of hours worked across subsamples

Subsamples	Obs.	Coef.	Std. Err.	*z*	*p* > *z*
Women	18,192	−266.0718***	46.84619	5.68	0.000
Men	15,586	−299.7452***	63.56274	4.72	0.000
Rural	19,662	−269.1892***	40.30745	6.68	0.000
Urban	14,116	80.35616	68.12696	1.18	0.238
Rural women	10,472	−258.2508***	49.49064	5.22	0.000
Rural men	9,190	−278.973***	66.19383	4.21	0.000
Urban women	7,720	25.54626	84.6432	0.3	0.763
Urban men	6,396	140.5549	111.8624	1.26	0.209

Note: ***$p < .01$.

households appears to be significantly lower compared with that in nonremittance-receiving households. We find that the observed rural effect of remittances is driven by women. Rural women who reside in the remittance-receiving household are significantly less likely to be in the labor force compared with those who reside in nonremittance-receiving households. The *F*-statistic for the instrument in all models is presented in Appendixes I and II. Overall, we show that remittances negatively impact labor supply decisions in Ghana, and this observed effect is driven more by rural women.

In terms of hours worked, we find the coefficient on remittances for women, men, and rural variables to be negative and highly significant. However, the coefficient on remittances in urban areas is positive and not significant. The results suggest that while remittances suppress labor force participation in rural areas, it has little impact on hours of work in urban areas. In addition, we find both rural men and women to be significantly impacted, with a slightly stronger effect in magnitude among rural men. The hours of work of urban men and women are least impacted by remittances. The coefficient on the remittance variable in both cases is positive but not significant.

6 | DISCUSSION AND CONCLUSION

Remittances play a major role in poor households. One of the undesired consequences of remittances is that they force households into intergenerational poverty by creating a situation of dependency on

remittance income. In this paper, we analyzed whether remittance being an outcome of labor migration does have any impact on labor supply decisions of family members left behind in Africa using detailed household- and individual-level data. Previous studies on this topic have been limited to Latin America and Asia. In the remittance-receiving model, we control for a number of important individual and household characteristics. These variables include the migration status of the household in which the individual resides, relations of the individual to the migrant household member, and morbidity at the household level. These variables are very important determinants of remittances particularly for sub-Saharan Africa and cannot be neglected in a remittance-recipient framework. Our estimation approach improves the limitations in existing studies and expands evidence on the topic to cover sub-Saharan Africa.

We estimate IV regression models that allow us to control for the endogeneity of remittances. We instrument remittance-receiving status of the household in which the individual resides with the share (degree) of mobile phone ownership among neighboring households of the individual. Testing for the validity of our instrument, we find an overall decrease in labor supply associated within the remittance-receiving status of the individual's household. Precisely, individuals in remittance-receiving households are significantly more discouraged to stay or enter the force compared with those who reside in nonremittance receiving household members. This negative effect of remittance on labor force participation is much stronger for rural than urban residents.

Our evidence is consistent with the "noncompetitive" labor market argument that in settings of high unemployment, once households can meet their consumption needs with remittances, they are discouraged from staying or entering the labor force. Our findings suggest that rural-based interventions may be needed to empower rural households to redirect remittances to productivity activities. Our study complements existing studies on the impact of remittances on labor supply decisions across the world.

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DATA AVAILABILITY STATEMENT

The data that support the findings of this study are openly available in the Ghana Statistical Service (GSS) data repository at https://www.statsghana.gov.gh/gssdatadownloadspage.php

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section.

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