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Rural financial intermediation and poverty reduction in Ghana

A micro-level analysis

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Abstract: The financial sector in rural areas, where most of the poor people in sub-Saharan Africa are found, has transformed massively in recent times, notably through the increased penetration of several types of rural financial intermediaries in addition to rural and community banks and microfinance institutions. Using recent household survey data, we ascertain the access of rural populations to various types of financial services, and the influence of rural financial intermediation on poverty reduction, in Ghana. By accounting for the potential endogeneity of access to financial services, we show that rural households with access to basic financial services are significantly more likely to be non-poor than those without such access. In order to more sustainably tackle the goal, highlighted in the Sustainable Development Goals, of eliminating global hunger or extreme poverty, the poor must be allowed to obtain meaningful access to financial services through the design of efficient pro-poor financial products.

Key words: rural financial intermediation, poverty reduction, welfare, financial inclusion, Ghana

JEL classification: G21, I31, I32

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1 Introduction

There has been renewed interest among academics and development policy practitioners in many parts of the world in examining the role of financial intermediation, and rural finance in particular, in improving household welfare. This is fuelled largely by the observation that financial sector development drives economic growth and poverty reduction, at the macro level (see, for instance, Hassan et al. 2011; Levine 1997; Odhiambo 2010; Quartey 2005; Uddin et al. 2013). Indeed, the development of a viable financial sector is important for both economic growth and poverty reduction (Jalilian and Kirkpatrick 2005; World Bank 2004). However, the important link between financial sector development and poverty reduction rests strongly on the extent to which financial services are accessible to a large mass of the population, and the poor in particular—a goal that is hardly achieved by mainstream financial markets.

Buchenau (2003) and Zeller and Sharma (1998) show that the financial needs of agriculture-dependent rural communities remain largely unsatisfied. According to the World Bank (2013), about 2.5 billion adults worldwide (about 80 per cent of whom are poor) do not have access to financial services. Further, more than two-thirds of the world's poor dwell in rural areas of developing countries (IFAD 2010). Increasing the outreach of financial services (such as credit, savings, and insurance-against-risk services) to cover rural communities and the poor in particular can go a long way to strengthening the productive assets of the poor and thus enhancing their productivity and potential for sustainable livelihoods (World Bank 2001). However, formal financial service providers often fail to open their doors to the poor due to the perceived high risks and low profitability associated with dealing with them. Stiglitz (1998) contends that market failure is a fundamental cause of poverty, and financial market failure—particularly asymmetric information and the high fixed costs of small-scale lending—limit the access of the poor to formal finance.

In light of the difficulties associated with access to conventional financial services, the rural banking concept was initiated in most developing countries, including Ghana, to provide institutional credit and other formal financial and banking services to people living and working in rural areas (Asiedu-Mante 2011). Since a large proportion of the population in these economies live in rural areas, the penetration of formal financial institutions, notably rural financial intermediaries, may be important in improving rural enterprise productivity and household welfare (see Burgess and Pande 2005; Imai et al. 2010). Improving poor people's access to affordable financial services assists them to smooth their consumption, manage risks better, gradually build assets, develop micro-enterprises, and enhance their earning capacity, as well as experiencing improved quality of life (Banerjee and Newman 1993). Nevertheless, the issue of whether improved rural financial intermediation exerts a positive influence on household welfare in Ghana remains an important question in the literature.

Over the years a number of programmes have been rolled out in Ghana, including the Rural Financial Services Project (RFSP), with the explicit goal of alleviating poverty through improved access to financial services among the poor. The recent poverty report by the Ghana Statistical Service (GSS 2014b) indicates that about 24.2 per cent of Ghanaians (about 4.3 percentage points lower than the rate recorded in 2005/06) are living in poverty, whereas close to a tenth of the population are characterized as being extremely poor. Ghana's poverty profile is, however, highly uneven across geographical and occupational dimensions, as most of the poor live in rural areas and are engaged in agricultural activities or a variety of micro-enterprises. For instance, the GSS (2014b) notes that the incidence of poverty in Ghana is still very much a rural phenomenon, with

extreme poverty being highly concentrated in the rural parts of Savanna region and highly skewed towards individuals engaged in agricultural activities.

Given the important space and time that is currently devoted to poverty reduction efforts in development policy circles, investigating the current role of rural financial intermediation in alleviating poverty in Ghana is paramount. Earlier scholars have examined the relationship between access to financial services offered by rural and community banks (RCBs)—which constitute a proportion of the financial intermediaries operating in rural areas of Ghana—and household welfare (see Danquah et al. 2017). These studies suggest that access to RCBs is important in improving household welfare. However, considering the fact that the rural financial sector has transformed massively in recent times, notably through the increased penetration of several types of financial intermediaries, aside from RCBs, into Ghana's rural areas,[1] this paper extends the extant literature on the issue by investigating the effect of access to financial services provided by regulated financial institutions (not limited only to RCBs) on household welfare in rural Ghana.

The remainder of the paper is structured as follows. In Section 2, we present an extensive review of the literature on the finance–poverty nexus. Section 3 presents the methodology and data used for the study. The empirical results on the effect on household welfare of access to financial services provided by rural financial intermediaries is considered in Section 4, while section 5 concludes the study.

2 Literature review

2.1 Definition and evolution of rural financial intermediation

Rural finance can be defined as financial services offered and used in rural areas by people of all income levels. Precisely, Pearce et al. (2004: 5) consider rural financial services as 'encompassing all savings, lending, financing and risk minimizing opportunities (formal and informal) and related norms and institutions in rural areas'. In most developing countries, the rural finance landscape has undergone tremendous transformation over the years. From the 1950s to the 1970s, financial intermediation in rural areas was largely dominated by extensive government involvement. This system was known as the *traditional approach* to rural finance, and it emphasized the removal of bottlenecks in access to finance by the rural sector. The degree of state intervention varied, from indirect measures aimed at improving the policy environment to direct measures aimed at increasing credit provision by private lenders to the rural sector, mainly farmers, at concessional interest rates (Yaron et al. 1997).

A fundamental assumption (based on the vicious circle of capital formation) of the traditional approach was that the savings potential in rural areas was so low that it was not worthwhile to mobilize savings or to offer savings facilities in such areas. World Bank (2004) and Zeller et al. (1997), for instance, maintain that the vicious circle can only be terminated by channelling external funds into rural areas to help raise the low investment rate. This, coupled with the views that governments should focus on agriculture to promote rural development, that agriculture is undercapitalized, that farmers need cheap credit to encourage them to adopt modern technology,

[1] For instance, microfinance institutions and other non-governmental financial organizations, as well as mainstream financial institutions such as banks.

and that the poor are largely underserved by mainstream private banks,[2] gave rise to the establishment of a number of specialized agricultural credit institutions to provide subsidized credit to specifically targeted agricultural investments.[3] The subsidized credit programmes, however, had only a limited outreach and resulted in huge costs, with only a marginal impact on the growth of agricultural output or productivity (World Bank 2004; Yaron et al. 1997). In many developing countries, including Ghana, government-supported rural credit programmes and institutions collapsed due to losses created by traditional directed credit strategies. More importantly, Fry (1995) and Gonzalez-Vega (2003) assert that these programmes created market distortions which hindered the extent of financial deepening in these countries.

The apparent weakness of the traditional approach to rural finance led to the adoption of a new *financial systems approach* in the 1980s (Yaron et al. 1997). The new approach makes the case for cost-effective alternatives in order to achieve the goals of income expansion and poverty reduction. It emphasizes the creation of enabling legislation and the establishment of appropriate institutions (Von Pischke 1996) and involves the removal of market distortions.[4] Specifically, the approach proposes that government should focus on establishing a favourable policy environment that facilitates the smooth functioning of rural financial markets, while playing a more limited and efficient role in the direct provision of rural financial services. Although the financial systems approach led to an improvement in the health and soundness of the financial sector in many developing countries, it resulted in a decline in bank lending to the rural sector. The vacuum created by the inability of both private- and state-led banks to meet the financial services needs of rural communities and micro-entrepreneurs inspired many non-governmental organizations (NGOs) to engage in the provision of rural finance (Cohen and Sebstad, 2003). Hulme and Mosley (1996) note that a number of these microfinance NGOs have become banks or other formal financial institutions[5] but retain their focus on the rural population and the urban poor.

Indeed, an important development related to the financial systems approach is the significant expansion of microfinance institutions (MFIs) in many developing countries. MFIs essentially promote several innovations in the financial sector, especially financial products and delivery mechanisms. Product innovations have been critical in promoting rural financial engineering with the goal of accelerating economic growth (Schrieder 1996; Zeller et al. 1997). For instance, the introduction of flexible and more-accessible savings facilities (for poor clients) reduces the risk of seasonal income shortfalls, since stress periods can be bridged through savings. The delivery mechanism innovations of MFIs include the use of technology to lower costs and extend the outreach of rural financial services (such as cash machines, palm-top computers, and mobile phones), while institutional innovations of MFIs include the use of community structures through village bank-type models.

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[2] The provision of little or no credit to rural entrepreneurs by the private banks gave rise to their over-reliance for credit on moneylenders who charge usurious interest rates.

[3] The subsidized credit regime received a lot of support from donors such as the World Bank. For instance, the World Bank lent about US$17 billion in agricultural credit under largely traditional programmes prior to 1992 (World Bank 1993).

[4] Through the withdrawal of the state from the direct provision of financial services, the deregulation of interest rates, and the abolition of credit controls.

[5] By licensing as formal financial intermediaries, these MFIs are subject to tight financial regulations.

2.2 The importance of rural finance for growth and poverty reduction

Improved financial intermediation generates greater access to financial services, which can affect poverty either directly or indirectly. The direct link relates to the extent to which improved financial intermediation widens access to financial services for the poor, whereas the indirect link is seen in the way in which financial intermediation impacts poverty through its positive effect on economic growth. Financial intermediaries help to mobilize hard-to-get savings, especially rural savings, which are then channelled into productive investments for growth and poverty reduction. The availability of rural financial intermediaries helps poor rural households to access savings and investment products, and thus may help to reduce their vulnerability. Given the higher levels of involvement in agricultural activities among the rural poor, coupled with the high volatility in agricultural incomes and rural health, all of which can destabilize consumption, rural finance assists the rural poor to smooth consumption and to build up assets. Furthermore, since rural households lack sufficient access to formal insurance, relying instead primarily on informal safety nets, improving their access to insurance could reduce enterprise and household risks and make investment in the rural economy more attractive, contributing to growth and poverty reduction (Skees 2003). Yaron et al. (1997) conclude that rural financial intermediation can be highly profitable, even when it serves low-income clients.

Micro-level studies on the relationship between financial intermediary development and poverty demonstrate that access to financial services is welfare-enhancing, especially in rural areas. Geda et al. (2006) utilized a household-level panel data set of urban and rural households in Ethiopia that covers the period 1994–2000. The authors observed that access to finance crucially enhances consumption smoothing and poverty reduction among Ethiopian households. Danquah et al. (2017) show that access to financial services provided by RCBs improves rural households' welfare in Ghana. Burgess and Pande (2005) used a panel data set for 16 major Indian states which spans the period 1961–2000 to evaluate the poverty impact of the Indian rural bank branch expansion programme. They found that a 1 per cent increase in the number of rural banked locations per capita reduced poverty by 0.42 per cent and increased total output by 0.34 per cent.

2.3 Rural finance in Ghana

The incidence of poverty in Ghana, notably extreme/food poverty, is significantly greater in rural than in urban areas. To deal with the poverty situation in Ghana, especially rural poverty, the government has focused on empowering rural communities through the integration of the informal and formal financial sectors, thus increasing the flow of financial services into rural areas. Rural financial institutions are perceived to be a critical conduit through which the rural poor can access financial services, since mainstream formal banks often shy away from lending to the rural sector.[6]

Like many other developing countries, Ghana employed the directed credit approach to intervention in rural credit markets from the 1950s to the 1980s. The Rural Banking Scheme was initiated in 1976, under the auspices of the Bank of Ghana, with the main aim of serving small borrowers and savers in rural areas, who at the time essentially had no access to institutional savings and credit facilities. After it had been operating for about a decade, the programme was

[6] Lending to rural areas is often viewed as risky by the mainstream commercial banks. This was made clear in 1999 when rural lending amounted to only 8 per cent of total commercial loans. The perception of risk was informed by factors such as farming, which is prone to weather and disease risks, being the dominant economic activity engaged in by rural populations; rural farmers having limited access to markets due to poor infrastructure; and some of the rural poor being unable to offer the conventional security for loans required by the commercial banks (IFAD 2012).

generally perceived to be a success. However, by the late 1980s many individual rural banks were in great difficulty. The government attempted to reinvigorate the programme via a macroeconomic financial liberalization effort initiated in 1988 and a comprehensive rural bank restructuring exercise which was begun in 1991. Despite these efforts, in the mid-1990s the 125 rural banks in operation were, in general, not fulfilling their promise and were struggling financially (Aryeetey 1996). More recently, the Government of Ghana, in collaboration with its development partners (the World Bank, the International Fund for Agricultural Development/IFAD, and the African Development Bank) rolled out the RFSP. The aim of the project is to holistically broaden and deepen rural financial intermediation in Ghana and thus facilitate rural welfare.

3 Methodology

3.1 Data and regression variables

The study utilized secondary data drawn from round six of the Ghana Living Standards Survey (GLSS 6) conducted in 2012/13 and containing data on 16,772 households and 72,372 individuals GSS 2014a). The GLSS is a multidimensional, nationally representative household survey that collects information on a wide range of individual-, household-, and community-level variables, including detailed demographic characteristics of the population, access to finance, education, health, employment, welfare, and household income, among others. The GLSS uses two poverty lines in its poverty status computations: a lower poverty line (otherwise known as the food/extreme poverty line) of GH₵792.00 per year; and an upper poverty line of GH₵1,314.00 per annum. A household is categorized as 'very poor' if its consumption expenditure per annum is less than the extreme poverty line and as 'poor' if its consumption expenditure per annum is between the lower and the upper poverty line.

Dependent variable

The core motivation of this paper is to examine the role of rural financial intermediation on poverty reduction/household welfare. As such, we use as a dependent variable the poverty status of a household. We classify all households with consumption expenditure per annum of below GH₵1,314.00 as poor and those above this line as not poor. The dependent variable, therefore, is a dummy variable, *Notpoor*, which assumes a value of 1 if the household is not poor and 0 otherwise. The mean of this variable is 0.7558, indicating that over 75 per cent of households are not poor.

Independent variables

Consistent with the extant literature (see Danquah et al. 2017; Geda et al. 2006), we include as regressors both household-level and contextual effects. In the GLSS, the question on access to 'basic' financial services is:

> Does (NAME) have a bank account or [are they] contributing to a loan/savings scheme?

The response to this question is 'yes' or 'no'; 'yes' is coded 1 and 'no' is coded 0. From this question, we create a variable named *Access* which assumes the values 0 and 1. This variable is a dummy, and it shows that over 53 per cent of households in Ghana have access to financial services (see Table 1A in the Appendix). Other household-level variables are the age of the household head (*Agehead*) and its square (*Agehead2*), household size (*Hsize*) and its square (*Hsize2*), a dummy capturing the

sex of the household head as male versus female (*Headmale1*), the education experience of the household head (*Hheduc1–Hheduc5*), the educational experience of the spouse of the household head (*Spouseduc1–Spouseduc5*), the occupation of the head of the household (H*occ1–Hhocc4*), *Locality1* (urban versus rural), and *Locality2* (*Region1–Region10*). Table 1A (Appendix) presents the summary statistics for regression variables.

The descriptive statistics reveal that the average age of a household head is 42, while household size ranges from 2 to 29 members with an average of about five members. Close to 98 per cent of households in the sample are headed by males. Less than 1 per cent of household heads do not have schooling experience, with over 52 per cent of household heads having a junior high school education. About 1 per cent of the spouses of household heads do not have any schooling experience, while over 50 per cent of household heads' spouses possess up to primary-level schooling. Over 64 per cent of household heads are engaged in agricultural activities, with only 12 per cent and 21 per cent working in the industry and service sectors, respectively. Slightly over a third of households are located in urban areas, whereas about 17 per cent of households are located in Eastern region and less than 3 per cent of households are located in Northern region.

3.2 Empirical estimation technique

The study is specifically motivated by the following research objectives: (i) to ascertain the access of rural populations to various types of financial services in Ghana; and (ii) to find out the extent of influence of rural financial intermediation on poverty reduction in Ghana.

To achieve the aforementioned research objectives, we do the following: first, objective (i) is achieved by providing a descriptive analysis of access to financial services in Ghana, both for the full sample and for only a subsample of rural households. Second, objective (ii) is achieved by econometrically assessing the effect of access to finance on household welfare, with a focus on rural households. Focusing on the second research objective, we specify the poverty status of a household as a function of access to financial services, other household characteristics, and contextual factors:

$$Notpoor_i = f(Access_i, HH_i, Contextual_i) \quad (1)$$

where $Notpoor_i$ is the poverty status of household i, HH_i represents household-level characteristics (such as age, sex, and educational attainment of the household head, among others) for household i, and $Contextual_i$ denotes the locality (urban versus rural and regional dummies) of household i. Equation 1 can be expressed functionally as:

$$Notpoor_i = \beta_0 + \beta_1 Access_i + Agehead_i + Agehead2_i + Hsize_i + Hsize2_i + Headmale_i + Hheduc_i + Spouseduc_i + Hhocc_i + Urban_i + Region_i + \varepsilon_i \quad (2)$$

where $Notpoor$ is a dummy variable showing whether a household is poor or not; $Access$ is a dummy variable indicating whether a household has access to financial services or not; $Agehead$ is a continuous measure of the age of a household head and $Agehead2$ is its square; $Hsize$ is household size, which is used here as a proxy for household labour supply, and $Hsize2$ is its square; $Headmale$ is a dummy variable indicating the sex of the household head; $Hheduc$ is the level of education of the household head and $Spouseduc$ is the level of education of the head's spouse; $Hhocc$ is the occupation of the household head; $Urban$ and $Region$ are locality dummies; and ε_i is the error term.

Although the emphasis of this study is on the rural economy, we deem it appropriate to also explore the dynamics of financial intermediation in Ghana, as a whole and for urban areas, in order allow for the opportunity of having some comparison models.

Empirical estimation issues and the choice of estimation technique

Empirical efforts to establish the link between poverty and access to financial services (especially access to credit) have been bedevilled with concerns of potential endogeneity bias. The problem of endogeneity can arise from three sources: measurement error, simultaneity, and mis-specification. A case of reverse causality or simultaneity may be present in the finance–poverty nexus, since on the one hand access to financial services (in most cases access to credit) improves the wellbeing of households, and on the other hand household welfare determines a household's access to financial services. Failure to account for the potential endogeneity problem in such circumstances often leads to biased estimates of the regression parameters. Given the nature of our dependent variable (whether a household is non-poor or not), an instrumental variable (IV) probit estimation technique could be employed to address the endogeneity problem in our specification. However, there are problems regarding the use of the IV estimation approach. The main problem with IV estimation is getting the 'right' instrumental variable(s) while at the same time ensuring that the other variables in the model are strictly exogenous. However, an important feature of the current study is that the endogenous variable (access to finance) is also a dummy. When the endogenous variable is a binary variable with a non-normal distribution, the IV technique is inappropriate (Geda et al. 2006). Consequently, we employ the *bivariate probit model* to account for the potential endogeneity problem in the empirical relationship. The maximum likelihood estimator of the bivariate probit model yields consistent and asymptotically efficient parameter estimates in the presence of one endogenous binary regressor (see Arendt and Holm 2006).

Thus, to allow for possible unobserved correlation between the poverty status of a household and access to financial services, we allow the error terms of the two equations to be distributed as a bivariate normal. Given that we aim to model the relationship between these two discrete choice variables, the decisions involve four cases (that is, $Notpoor$ = 0 or 1; and $Access$ = 0 or 1). The likelihood function that captures these features can be shown as a bivariate probit model (see Carrasco 1998). Hence, the bivariate probit model can be formulated as:

$$Notpoor_i = \beta X_i + \delta Access_i + \varepsilon_i$$

$$Access_i = \gamma Z_i + \mu_i$$

$$E(\varepsilon_i) = E(\mu_i) = 0; Var(\varepsilon_i) = Var(\mu_i) = 1; cov(\varepsilon_i, \mu_i) = \rho \quad (3)$$

The model is identified if there is at least one variable in Z that is not contained in X. Rho (ρ) measures the degree of correlation between the error terms of the structural equations. If ρ is significantly different from 0, this means that the errors are correlated and hence there is endogeneity. A negative value for ρ indicates that the unobserved variables have opposite effects on the two outcomes, while a positive ρ value indicates that the unobserved variables influence the outcome variables in the same direction. Finally, for the sake of robustness, we also estimate a simple probit model of the finance–poverty nexus for the rural subsample and also for the whole (rural plus urban) sample. The marginal effects of the estimated parameters are obtained to provide information on the extent of influence of access to financial services on household welfare in Ghana, especially among rural households.

4 Empirical results

The empirical discussion in this study proceeds as follows: first, we present a descriptive overview of access to financial services in Ghana, and among rural households in particular; second, we present and discuss the empirical estimations of the effect of financial sector development (with a focus on rural financial intermediation) on household welfare in Ghana.

4.1 Access to financial services in rural Ghana: A descriptive analysis

From Table 1, it is observed that more than half of households in Ghana (as a whole) have no access to basic financial services—for instance, owning a bank account. The situation is even worse among rural households, with only a third of households in Ghana's rural economy having access to basic financial services. Regarding access to commercial banks' financial services, we establish that only 24 per cent of Ghanaian households have accounts that are held in a commercial bank, while just a little over one-tenth of households in rural Ghana own a commercial bank account; this incidence is not significantly different from the proportion of rural households with an account that is held in a rural and community bank—only 12.5 per cent of rural households in Ghana have an account in an RCB. Interestingly, however, only 6 per cent of households in Ghana have access to financial services provided by a savings and loans institution, and about 2 per cent and 7 per cent of households possess accounts in a co-operative/credit union and in susu schemes, respectively.[7]

Table 1: Proportion of households with access to financial services

Type/sample	Full sample	Rural subsample
	% of sample	% of sample
Access	47.85	34.41
Access_CB	23.65	13.00
Access_RCB	14.22	12.52
Access_SLS	5.98	3.96
Access_CCB	2.20	1.82
Access_SS	6.60	6.70

Notes: *Access* captures general access to any form of financial service; *Access_CB* whether any member of a household has an account in a commercial bank; *Access_RCB* whether any member of a household has an account in an RCB; *Access_SLS* whether any member of a household has an account in a saving and loans scheme; *Access_CCB* whether any member of a household has an account in a co-operative/credit union; and *Access_SS* whether any member of a household has an account in a susu scheme.

Source: authors' calculation based on GLSS data (GSS 2014a).

[7] A susu scheme is 'a type of informal savings club arrangement between a small group of people who take turns by "throwing hand", as the partners call it'; see https://en.wikipedia.org/wiki/Susu_(informal_loan_club).

Among rural households, the third most patronized financial product is the susu scheme (about 7 per cent of rural households have an account with a susu scheme), and financial services provided by co-operative/credit unions have the least patronage, reflecting largely the conspicuous lack of engagement of such financial intermediaries with inhabitants of Ghana's rural communities. About 4 per cent of rural households in Ghana hold an account in a savings and loans scheme. Further, in terms of general access to financial services, we show that most (over 88 per cent) of the households with access to a financial service in Ghana are non-poor, with the proportion declining to about 77 per cent among households in rural Ghana (see Table 2). Now, considering the distribution of access to the three main sources of financial services across poor and non-poor households, we observe that most households with access to financial services provided by any of the three types of financial service providers (i.e. commercial banks, RCBs, and susu schemes) are not poor. For example, over 92 per cent of households with an account in a commercial bank are non-poor. A similar trend is observed with regard to access to financial services provided by RCBs and susu schemes. In rural Ghana, however, we observe an impressive proportion of poor households with access to financial services provided by the various financial intermediaries (see Table 2). Further, in rural Ghana, access to financial services provided by susu schemes is relatively well distributed between poor and non-poor households.

Table 2: Proportion of households with access to financial services, by household poverty status

Type/sample	Full sample		Rural subsample	
	Poor	Non-poor	Poor	Non-poor
Access	12.27	87.73	23.25	76.75
Access_CB	7.14	92.86	16.42	83.58
Access_RCB	14.14	85.86	21.94	78.06
Access_SS	24.32	75.68	35.36	64.64

Notes: *Access* captures general access to any form of financial service; *Access_CB* whether any member of a household has an account in a commercial bank; *Access_RCB* whether any member of a household has an account in an RCB; and *Access_SS* whether any member of a household has an account in a susu scheme.

Source: authors' calculation based on GLSS data (GSS 2014a).

Moreover, considering the reasons for not having a bank account, we find that over 70 per cent of the respondents who had no bank account blamed their lack of access to financial services on having a low or irregular income, while close to one-fifth of the respondents without access to financial services indicated that they did not find it necessary to hold a bank account (see Table 3). At the same time, about 2 per cent of the respondents without access to a bank account noted that this was due to the inaccessibility of financial institutions in their locality, while less than 1 per cent of respondents without a bank account maintained that this was due to the cumbersome nature of account opening processes. Over 2 per cent of individuals without access to basic financial services blamed this on their lack of awareness about the existence of a financial institution. Thus, the incredible number of respondents whose non-access to basic financial services can be blamed on the fact that they have low or irregular income suggests that household welfare causes access to financial services—hence the need to account for the potential endogeneity bias in the model of the determinants of household welfare.

Table 3: Main reasons for not having a bank account

	% of household heads
Not necessary/interested	18.34
Not aware of one	2.36
Process cumbersome	0.79
Financial institution too far away	1.56
Don't have enough money or income	45.67
Don't have regular income	29.36
Other	1.92
Total	100

Source: authors' calculation based on GLSS data (GSS 2014a).

4.2 Econometric analysis of the effect of access to financial services on household welfare

In this subsection, we provide an econometric analysis of the role of access to basic financial services in enhancing household welfare in Ghana, and in rural areas in particular. We run five separate estimations in an attempt to robustly provide evidence on the peculiarity of the finance–poverty nexus in rural areas. Table 4 presents the results from the empirical estimations. Model 1 in Table 4 presents the results from the full sample estimations using two different estimation techniques—a simple probit model that models the determinants of household poverty status without accounting for endogeneity, and a bivariate probit model that accounts for the endogeneity of households' access to basic financial services in a model of the determinants of household poverty status. Model 2 presents the outcomes from the rural sample estimations (with and without accounting for the endogeneity of access to financial services) and a bivariate model of the determinants of household poverty in an urban context.

In both the full sample and the rural subsample estimations, it is clear that without accounting for the endogeneity of access to financial services in the household welfare model, one runs the risk of producing regression estimates that are spurious. In particular, the estimated value of ρ is significantly different from 0, at the 1 per cent level of significance in both the full sample and the rural subsample. However, the problem of endogeneity appears to be absent in the urban subsample estimation, since the estimated value of ρ failed to attain statistical significance at any of the conventional levels of significance. Importantly, we show that when controlling for the endogeneity of access to financial services, the extent of influence of access to financial services on household welfare is much larger than when the endogeneity of access to financial services is unaccounted for. Specifically, the marginal effect of access to financial services on the probability of being non-poor is about two times greater, and close to three times greater in the full sample and rural subsample estimations, respectively, when the endogeneity of access to financial services is accounted for than when one ignores such endogeneity concerns. These observations clearly demonstrate the superiority of the bivariate probit estimation over the simple probit estimation. Thus, our empirical discussion puts emphasis on the bivariate probit estimations.

The empirical results show that, controlling for household characteristics and contextual factors, households' access to financial services exerts a significant and positive influence on household welfare in Ghana, especially in rural areas. In particular, the marginal effects estimates indicate that

having access to a financial service increases the probability of being a non-poor household by about 106 per cent and 167 per cent in Ghana and in rural Ghana, respectively. The relatively high magnitude of the effect of access to financial services on household welfare in rural Ghana provides stronger evidence of the crucial role that financial services intermediation plays in the socioeconomic development of rural households, and it thus calls for the deepening of the financial landscape in rural economies. This finding corroborates the observations of earlier studies (see Danquah et al. 2017, for instance)

Other household characteristics, such as the age of the household head, the membership size of a household (only in the full sample), whether the household head has a post-senior high school educational experience, the occupation of the head of the household, the type of locality (urban versus rural), and the regional location of the household, are important in determining household welfare in Ghana (see Table 4). In the full sample estimation, the marginal effects estimate shows that urban households are about 38 per cent more likely to be non-poor than their counterparts in rural areas (Model 1 in Table 4).

Table 4: Marginal effects of the determinants of household welfare (full sample and rural versus urban subsamples)

	Model 1 Full sample		Model 2 Sub-samples		
	Probit (*Notpoor*)	Biprobit (*Notpoor*)	Biprobit (*Notpoor*)	Biprobit (*Notpoor*)	Probit (*Notpoor*)
Variables	Ghana	Ghana	Urban	Rural	Rural
Access	0.526***	1.061***	0.080	1.673***	0.588***
	(0.059)	(0.320)	(0.870)	(0.164)	(0.070)
Agehead	−0.001	0.037***	0.032	0.042***	−0.012
	(0.015)	(0.015)	(0.019)	(0.016)	(0.018)
Hsize	−0.358***	−0.351***	−0.304***	0.035	−0.366***
	(0.045)	(0.042)	(0.098)	(0.038)	(0.048)
Hsize2	0.014***	0.013***	0.010	0.012***	0.015***
	(0.003)	(0.003)	(0.007)	(0.003)	(0.003)
Headmale	0.254	0.259	0.393	−0.077	0.261
	(0.167)	(0.171)	(0.327)	(0.188)	(0.208)
Hheduc2	0.064	0.024	0.320	0.374	−0.037
	(0.270)	(0.274)	(0.430)	(0.385)	(0.356)
Hheduc3	0.239	0.156	0.688	−0.187	0.044
	(0.267)	(0.277)	(0.420)	(0.384)	(0.355)
Hheduc4	0.500*	0.722***	0.455	0.992**	0.389
	(0.286)	(0.302)	(0.342)	(0.361)	(0.378)
Hheduc5	0.522*	1.158***	0.485	1.768***	0.305
	(0.290)	(0.309)	(0.347)	(0.368)	(0.385)
Hhocc1	0.438**	0.477**	−0.148	0.642***	0.578**
	(0.196)	(0.206)	(0.426)	(0.232)	(0.248)
Hhocc2	0.810***	0.755***	0.413	0.692***	0.893***
	(0.206)	(0.220)	(0.436)	(0.252)	(0.264)
Hhocc3	0.775***	0.700***	0.441	0.643***	0.825***
	(0.199)	(0.216)	(0.442)	(0.244)	(0.256)
Urban	0.443***	0.377***			
	(0.070)	(0.080)			
Region1	0.956***	0.883***	0.190	0.375**	1.144***
	(0.129)	(0.149)	(0.382)	(0.147)	(0.160)
Region2	0.860***	0.874***	−0.148	0.895***	1.103***

	(0.135)	(0.140)	(0.448)	(0.169)	(0.166)
Region3	0.978***	0.906***	0.359	0.439**	0.692***
	(0.147)	(0.171)	(0.383)	(0.221)	(0.231)
Region4	0.599***	0.595***	−0.327	0.659***	0.818***
	(0.126)	(0.137)	(0.397)	(0.159)	(0.162)
Region5	0.751***	0.713***	−0.080	0.762***	0.970***
	(0.126)	(0.139)	(0.371)	(0.149)	(0.159)
Region6	1.080***	0.953***	0.332	0.836***	1.272***
	(0.134)	(0.170)	(0.383)	(0.154)	(0.172)
Region7	0.671***	0.541***	−0.328	0.500***	0.960***
	(0.135)	(0.165)	(0.379)	(0.187)	(0.168)
Region8	0.439**	0.397**	−0.319	0.435**	0.623***
	(0.170)	(0.176)	(0.406)	(0.222)	(0.219)
Region9	0.648***	0.636***	0.052	0.667***	0.804***
	(0.152)	(0.163)	(0.474)	(0.177)	(0.186)
Constant	−0.051	−0.055	0.461	0.135	0.116
	(0.490)	(0.492)	0.461	(0.561)	(0.608)
Rho (ρ)		0.317***	0.173	−0.928***	
		(0.0367)	(0.524)	(0.257)	
Wald chi2(*)	725.36	1,411.41	438.19	1,121.52	422.59
Prob > chi2	0.0000	0.0000	0.0000	0.0000	0.0000
Observations	4,481	4,481	2,319	2,162	2,162

Notes: robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1; we control for the educational attainment of the spouse of the household head and the square of the age of the household head in all estimations; the reference category for *Headmale* is female; the reference category for *Hheduc* is 'no education'; the reference category for (*Hhocc*) is 'working in other non-classified sectors'; the reference category for the urban dummy is rural; and the reference category for region is Upper West.

Source: authors' calculation based on GLSS data (GSS 2014a).

5 Conclusion

In this paper, we have examined the role of rural financial intermediation in poverty reduction in sub-Saharan Africa using a nationally representative household survey data set for Ghana. Specifically, the current study provides new evidence on the role of financial development (rural financial intermediation) in improving the welfare of households, especially rural households. The empirical results, based on robust estimation techniques, show that access to financial services is important in improving household welfare. In particular, among rural households, having access to financial services raises the likelihood of being non-poor by over 160 per cent compared with not having access to financial services, *ceteris paribus*. This finding provides stronger evidence on the crucial role that financial services intermediation plays in the socioeconomic development of rural households and thus provides evidence for the need to promote access to financial services among rural households. Other factors that influence household welfare in rural areas are the age, educational experience (especially post-secondary schooling), and occupation of the household head.

The findings of this study have important implications for policy action. Indeed, as shown in this study and in many other studies, having access to financial services helps to improve the welfare of households, especially rural households. The channel of influence, however, may be through savings or credit disbursement. While it is usually argued that rural economies require access to credit facilities (a philosophy that informed the traditional approach to rural finance), recent evidence suggests that the most important financial product required by rural economies is one

that provides opportunities for rural households to save. By providing savings mechanisms to poor rural households, financial intermediaries will be able to mobilize hard-to-get rural savings. These savings may then be extended as credit to rural entrepreneurs with viable economic projects. The efficient and effective mobilization and utilization of rural savings would therefore engender rural socioeconomic development and hence an improvement in the welfare of rural households. Thus, in order to more sustainably tackle the goals of eliminating global hunger or extreme poverty, as highlighted as part of the Sustainable Development Goals, the poor must be allowed to obtain meaningful access to financial services through the design of efficient pro-poor financial products.

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Appendix

Table 1A: Description and summary statistics for regression variables

Variable	Description	Mean	S.D.	Range
Notpoor	Binary: this captures the poverty status of a household and it assumes the values 0 and 1. A zero value is obtained if the household is poor and 1 otherwise.	0.7557817	0.4297222	0–1
Access	Binary: this captures access to financial services or financial inclusion. It takes a value of 1 if any member of a given household has access to financial services.	0.5346901	0.4989105	0–1
Agehead	Continuous: this measures the age of the household head.	41.84181	12.25436	18–96
Agehead2	Continuous: this is a square of the age of the household head and is meant to capture the non-linearity in the effect of age.	1900.837	1,147.611	324–9,216
Hsize	Continuous: this captures the size of a household.	5.185014	2.308666	2–29
Hsize2	Continuous: this is a square of the size of a household and captures the non-linearity in the effect of household size.	32.21184	35.89535	4–841
Headmale1	Binary: this captures the sex of the household head. It assumes a value of 1 if the head is male and 0 otherwise.	0.9740981	0.1588795	0–1
Hheduc1	Binary: this measures the educational experience of the household head. It assumes a value of 1 if the household head has no educational experience and 0 otherwise.	0.0094175	0.09659	0–1
Hheduc2	Binary: this measures the educational experience of the household head. It assumes a value of 1 if the household head has only up to primary education and 0 otherwise.	0.2987974	0.4578367	0–1
Hheduc3	Binary: this measures the educational experience of the household head. It assumes a value of 1 if the household head has only up to junior high school education and 0 otherwise.	0.5222017	0.4996224	0–1
Hheduc4	Binary: this measures the educational experience of the household head. It assumes a value of 1 if the household head has only up to senior high school education and 0 otherwise.	0.0892692	0.2851979	0–1
Hheduc5	Binary: this measures the educational experience of the household head. It assumes a value of 1 if the household head has up to post-senior high school education and 0 otherwise.	0.0823312	0.2749322	0–1
Spouseduc1	Binary: this measures the educational experience of the spouse of the household head. It assumes a value of 1 if the household head's spouse has no educational experience and 0 otherwise.	0.0102525	0.1007439	0–1
Spouseduc2	Binary: this measures the educational experience of the spouse of the household head. It assumes a value of 1 if the household head's spouse has only up to primary education and 0 otherwise.	0.5037003	0.500102	0–1
Spouseduc3	Binary: this measures the educational experience of the spouse of the household head. It assumes a value of 1 if the household head's spouse has only up to junior high school education and 0 otherwise.	0.4153562	0.4928973	0–1
Spouseduc4	Binary: this measures the educational experience of the spouse of the household head. It assumes a value of 1 if the household head's spouse has only up to senior high school education and 0 otherwise.	0.0434783	0.2039783	0–1

Spouseduc5	Binary: this measures the educational experience of the spouse of the household head. It assumes a value of 1 if the household head's spouse has up to post-senior high school education and 0 otherwise.	0.0323774	0.1770413	0–1
Hhocc1	Binary: this captures the occupation of the household head. It assumes a value of 1 if the head works in the agricultural sector and 0 otherwise.	0.6489362	0.4774133	0–1
Hhocc2	Binary: this captures the occupation of the household head. It assumes a value of 1 if the head works in the industrial/manufacturing sector and 0 otherwise.	0.1221092	0.3274876	0–1
Hhocc3	Binary: this captures the occupation of the household head. It assumes a value of 1 if the head works in the services sector and 0 otherwise.	0.213691	0.410006	0–1
Hhocc4	Binary: this captures the occupation of the household head. It assumes a value of 1 if the head works in 'Other not classified' sectors and 0 otherwise.	0.0140695	0.1177814	0–1
Urban	Binary: this captures the locality of the household (that is, whether the household is located in urban versus rural areas). It takes a value of 1 if urban and 0 otherwise.	0.3796772	0.4853099	0–1
Region1	Binary: this captures the regional location of a household and takes a value of 1 if the household is located in Western region and 0 otherwise.	0.1646623	0.3709613	0–1
Region2	Binary: this captures the regional location of a household and takes a value of 1 if the household is located in Central region and 0 otherwise.	0.1211841	0.3264166	0–1
Region3	Binary: this captures the regional location of a household and takes a value of 1 if the household is located in Greater Accra region and 0 otherwise.	0.0309898	0.1733302	0–1
Region4	Binary: this captures the regional location of a household and takes a value of 1 if the household is located in Volta region and 0 otherwise.	0.1359852	0.3428521	0–1
Region5	Binary: this captures the regional location of a household and takes a value of 1 if the household is located in Eastern region and 0 otherwise.	0.1651249	0.3713791	0—1
Region6	Binary: this captures the regional location of a household and takes a value of 1 if the household is located in Ashanti region and 0otherwise.	0.1211841	0.3264166	0—1
Region7	Binary: this captures the regional location of a household and takes a value of 1 if the household is located in Brong Ahafo region and 0 otherwise.	0.1123959	0.315926	0—1
Region8	Binary: this captures the regional location of a household and takes a value of 1 if the household is located in Northern region and 0 otherwise.	0.0296022	0.1695265	0—1
Region9	Binary: this captures the regional location of a household and takes a value of 1 if the household is located in the Upper East region and 0 otherwise.	0.066605	0.2493943	0—1
Region10	Binary: this captures the regional location of a household and takes a value of 1 if the household is located in Upper West region and 0 otherwise.	0.0833085	0.2763562	0—1

Source: authors' calculation based on GLSS data (GSS 2014a).