FINANCIAL EXCLUSION: WHAT DRIVES SUPPLY AND DEMAND FOR BASIC FINANCIAL SERVICES IN GHANA?

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Abstract

The majority of people in Sub-Saharan Africa does not have a basic bank account and are financially excluded from mainstream financial services. This paper examines factors that drive geographic exclusion of banking services to rural communities and households' demand for a basic bank account in Ghana. Using rural community based and household survey datasets, the study finds that banks' decisions to place a branch in a community are positively influenced by elements as the market size, the level of infrastructure such as energy and communication facilities in the area, market activeness but are negatively influenced by the general level of insecurity associated, for example, with crime, conflict, natural disasters. Conversely, households' demand for a bank account appears to be strongly driven by both market and non-market factors such as price, illiteracy, ethno-religion, dependency ratio, employment and wealth status as well as proximity to a bank.

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1. INTRODUCTION

In recent years, Ghana has witnessed a phenomenal increase in foreign banks entry and expansion in bank branch penetration. As of mid 2008, the number of commercial banks has increased from 11 in 1990 to 24 with over 500 branches across the country. At the end of the same year, the total assets of the banking system have also risen by about 88 percent in two years to reach $ 6,616.1 million (51.7 percent of GDP)[1]. However, available data show

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[1] In addition to this there are 125 rural/community banks with over 500 branches/agencies in the country with the main objective of bringing the rural population into the mainstream

that over 80 percent of the country's population does not have a basic bank deposit account and is financially excluded from mainstream financial institutions. A recent World Bank (2008) report corroborates this with the report that only 16 percent of the adult population (which contrasts sharply with the average of 95 percent of the developed world) has a bank deposit account in the formal banking system. Savings mobilisation is therefore very low especially in rural Ghana where there is very little institutional organization and positive return on saving is virtually non-existent (Aryeetey, 2004).

The existing literature has many definitions and dimensions of what constitutes financial exclusion, often based on varied socio-economic factors with very complex interactions. Broadly, financial exclusion has been defined as developments that prevent poor and disadvantaged social groups from gaining access to mainstream financial system (Chant and Link, 2004). More specifically, it has been defined to reflect particular circumstances such as: geographic exclusion; exclusion due to prohibitively high charges; exclusion from marketing segmentation; or even exclusion based on self beliefs (Kempson, 2006). However, because financial exclusion may be driven by different factors in different countries, it is important that its definition be situated within the specific financial development context of a country. In Ghana's context, for example, financial exclusion is seen in a situation where the majority of individuals, households, enterprises as well as communities have no engagement whatsoever with mainstream formal financial institutions. They are the core exclusion, often referred to as the "unbanked", who do not even have a basic bank deposit account.

Nevertheless, studies have shown that the unbanked want a saving deposit account, which has been referred to as the "forgotten half" of microfinance (Helms, 2006)[2], and desire the benefits of formal bank accounts. However, they are constrained by their low incomes, and often lack a safe and convenient saving institution that allows for smallholder balances and transactions. The importance of savings, however, is that the unbanked are two times disadvantaged; first in terms of asset-building and second in qualifying for loans. While financial institutions are reluctant to lend to the un-

banking system under rules designed to suit their socio-economic circumstances and the peculiarities of their occupation in farming and craft making. Together with their branches, rural banks constitute the largest banking network in Ghana and the largest in the rural financial system. (see Bank of Ghana, 2008).

[2] The study by Honohan (2004b) has also shown that MFIs in many countries do not engage in saving mobilization and are also limited in scale reaching less than 2% of the population in most countries. In Ghana the total outreach remains limited to about 60,000 clients (Basu et al., 2004).

banked, depositors and account-holders are better positioned to negotiate investments insofar as savings can serve not only as collateral, but also as a demonstration of income and of financial discipline (Solo, 2005).

In the face of intense competition among the banks in Ghana in recent times, banks have renewed their efforts to broaden access by downscaling to reach out to the new and vast markets of the unbanked. However, a cursory look at the situation shows that there is an over concentration of these efforts in the urban centres, especially in the southern geographical areas of the country to the neglect of the north and the rural communities. Most of the banks are unwilling to penetrate or have closed down branches in the rural communities for one reason or the other. Even the rural banks that have been set up with the mandate of mobilising and advancing finance to farmers and enterprises in the rural areas, have virtually stopped expanding their branch networks to these areas. They are rather seen opening branches in the big cities and district capitals[3].

It is interesting to note that the percentage of banks in the rural communities have decreased from about 10.4 in 1992, 9.8 in 1998 to the recent 5.3 in 2006 according to the respective reports of Ghana Living Standard Surveys. This no doubt reflects the high level of geographic exclusion as confirmed by recent World Bank (2008) branch penetration indicators. These indicators show among others that in Ghana there are only 1.43 bank branches per 1000 km[2]. However, if we are to consider the observation made by (Kempson, 2006) that lack of physical access to a bank greatly increases the psychological barriers from the use of banking services, then commercial banks' placement decision to open or close a branch in a community is crucial for all inclusive financial services. The issue therefore is what factors drive a bank to open a branch in a community or reach out to new clients apart from its own internal mechanisms.

Another important question that one may also ask is that in case the banks eventually locate, would they survive in their new communities? "Banks' survival, besides efficiently managing their cost, also depends to a large extent

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[3] Even though the semi- formal that includes NGOs MFIs, Savings and Credit Unions and informal providers such as the *SUSU* schemes engage in rotating savings and credit associations (ROSCA), etc exist in some rural communities, they are either not allowed by banking regulations or lack the capacity to mobilise savings on the large scale. The semi-formal and the informal often serve the lower ends of the market. It will be interesting to know whether these activities complement or substitute for the formal banking sector but that goes beyond the scope of this study. It is however interesting to note that some of the commercial banks have began to collaborate with some SUSU schemes to open an account and save the monies collected from market women and other members on their behalf (e.g., Barclays Ghana SUSU Scheme).

on the demand for the services they provide. However, economic agents can have physical access to a bank, but may not use the services either voluntarily or involuntarily, if they are prevented by some other factors (World Bank, 2008). In Ghana, for example, Aryeetey (2004) observes that most rural households prefer far less liquid productive assets such as land, building, livestock, etc because there are some costs perceived to be associated with financial assets that discourage households from holding them. This, in part, has led to several banks closing their branches in certain communities because of low patronage. This appears to be the case of voluntary self exclusion as noted above, due perhaps to cultural/religious issues, as well as illiteracy or affordability and eligibility issues[4]. However, there is strong evidence that having a bank account greatly increases the probability of savings (Reddy *et al.*, 2005). The fact that over 80 percent of the labor force is within informal sector activities, and those working in low paid jobs are paid in cash instead of having their wage deposited in a bank account, indicates that the majority of these people do not engage in savings because they do not have a bank account.

Thus, much as the factors that drive supply of financial service to a community or branch placement decision are important; factors that determine the demand of these services are equally crucial to ensure a holistic approach to broad access to financial services. Even more important is the fact that given the current global financial crisis, which has been predicted to hit developing countries much harder through reduced capital inflow, aid and remittances, countries like Ghana can no longer look abroad but rather look within to mobilize savings to close the huge saving gap for development.

This study utilises a national household's survey dataset to investigate two important aspects of financial exclusion – geographic exclusion from the supply side and socio-economic exclusion on the demand side. In particular, the purpose of this paper is twofold. First, to examine factors that determine commercial banks' branch placement or geographic penetration to rural communities in Ghana. And second, to examine which socio-economic conditions of the household are important drivers of households' demand and use of basic savings account from commercial banks. The rest of the study is organized as follows: section two explains the analytical frameworks, and model specifi-

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[4] Beck et al. (2007a) report that the minimum amount to open a savings account in Ghana is 22.69% of GDP per capita whereas the number of documents such as identification, payment slip, letter of reference, proof of address or rent agreement etc, to open such account is 3.24 from a scale of 5. The former may discourage households with low income earners whereas the latter may disqualify people of certain age, migrants and the majority in the informal sector from gaining access.

cations; the third section focuses on data source and variable descriptions; section four discusses the results of the estimation of the model for determinants of banks outreach decisions, while section five discusses the results of the determinants of households' savings demand model. The sixth section summarizes the findings, policy recommendations and implications.

2. ANALYTICAL FRAMEWORK: ACCESS POSSIBILITY FRONTIER FOR BASIC SAVING AND PAYMENTS SERVICES

In a very resourceful paper, Beck and Torre (2006) argue that the "problem of access" (what we termed financial exclusion) should rather be analyzed by identifying different demand and supply constraints. They use the concept of an Access Possibilities Frontier (hereinafter referred to as APF) for saving and payment services to distinguish between cases where a financial system settles below the constrained optimum and cases where this constrained optimum is too low. Their analytical framework is similar in spirit to the present study, and thus we draw on the underlying concept of deriving the APF for our analytical analysis.

The APF for payment and saving services is defined as the maximum share of population that could be served by financial institutions, for a given set of "state variables". This share is determined by the aggregate supply and demand of the services provided. However, according to Beck and Torre (2006), this share or the bankable population in many developing countries are often far below the constrained optimum due to certain limitations. The APF concept reflects three main sub-optimal constraints that constitute access problems or financial exclusion. These are:

- A constrained sub-optimality, due to an inefficient (or high transaction cost) supply system, which leads to an equilibrium where the banked population is lower than the bankable population, given the state variables.
- A constrained sub-optimality due to demand deficiency that leads to a lower than potential possibilities frontier as a result of non-economic factors that lead to self-exclusion of economic agents.
- The third type of access problem would be obtained if the bankable population associated with the frontier were "too low" relative to countries with comparable levels of economic development. This situation could arise, for example, if the country in question lags behind its comparators in certain state variables (say, higher level of general insecurity or weaker informational and contractual environments).

As previously mentioned, these access problems can be grouped in two

main categories of financial exclusion. The first is geogeographic exclusion, which is mirrored in the absence of bank branches or branch closures in remote or sparsely populated rural areas that are costlier or riskier to service. The second is socio-economic exclusion. That is when specific income, social or ethnic groups are excluded from mainstream financial services either because of high price, financial illiteracy, or discrimination, etc.

The underlying factors for these two exclusions are explained below.

2.1 Towards Defining the Problem of Geographic Exclusion or Bank Branch Location Decisions

In an approach similar to the one adoptedd by Calcagnini et al. (1999), we view each bank as having a two-stage decision-making process – one, how many branches to open and two, in which communities to place them. With commercial banks guided by the sole motive of maximising profit, the decision to open a bank in a particular community is underpinned by the standard principle of cost theory and/or an evaluation of the present value of future returns. As Zellar *et al.* (2001) observe it makes sense to open an additional outlet whenever projected marginal revenue from a new branch is at least as high as the total cost of establishing the branch. Practically however, it is also important to think of banks' branch location decisions or supply of saving and payment services to be driven by two main factors which Beck and Torre (2006) refer to as "state variables" and idiosyncratic cost management for a given level of state variables.

The idiosyncratic cost management is considered as an internal matter, peculiar to individual financial institutions. This arises from the actions or strategies of managers to mitigate default risks in credit transactions. This credit risk, which is specific to individual debtors or projects, often arises from non-performance by a debtor either from an inability or unwillingness to repay loan or fulfil pre-committed contract. However, this can be eliminated or avoided within the realm of an individual bank by simple business practices such as underwriting standards, hedges or asset-liability matches, diversification, reinsurance or syndication, and due diligence investigation (Oldfield and Santomero, 1997). On the contrary, the APF framework treats as state variables those that are largely outside the control of the managers of the institutions and that also change slowly over a long time. These include the following: market size, macroeconomic fundamentals, available technology, the average level and distribution of per capita income, and system-wide costs of doing business related, for instance, to the quality of transport and communication infrastructure, the effectiveness of the contractual and

informational frameworks, and the degree of general insecurity associated with crime, violence, terrorism etc.

The importance of these state variables in determining supply of banking services is because of their close association with fixed transaction costs in providing financial services[5]. Besides the primary cost of setting up a bank branch, a low level of infrastructure and a weak institutional environment can also add up to the fixed transaction costs. Porteous (2005) observes that high fixed costs can entrap a small financial system at a low level equilibrium and thus hamper supply. How then can high fixed cost be surmounted? The APF framework suggests that this can be overcome by exploiting scale economies either through sufficiently high-volume or high-value transactions that will result in decreasing unit costs. However, high volume and high-value transactions exhibit a trade-off in deriving the supply schedule. This implies that if institutions decide to operate in a higher value region, they will have to serve a relatively small clientele but still make the same profit as serving higher volume or number of clients (or unbanked population) with low transaction value[6].

However in most cases, especially in developing economies, financial institutions are more likely to cluster at the high value transaction region because of high switching costs and often low level of state variables in the low value transactions region. They will rather simply stay in the cities where they can easily make profit by targeting larger companies and wealthier households and would thus have little or no incentive to reach out to small communities, smaller firms and poorer households. The end result therefore is a sub-optimal equilibrium where the banked population is lower than the bankable population[7]. To get out of this quagmire therefore, Beck and Torre (2006) APF framework suggests that a remarkable improvement in the state variables such as a considerable growth in market size, a technological ad-

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[5] Narrowing it down to the level of a financial institution, fixed costs are vital and span across a wide range – from the brick-and-mortar branch network, to other physical, technological platforms, to legal and accounting systems, available infrastructure and to security arrangements – and are rather independent of the number of clients served or the number of transactions processed (Beck and Torre, 2006).

[6] This is shown via an iso-profit curve that defines the combinations of transaction value and transaction volume of payments and savings services that yield the same profit for a given financial institution.

[7] This is because the supply curve for broad access is slopping upward, showing positive relationship between fee per transaction and number of client suggesting that the only way to increase supply of financial services to marginal customers is to increase the fee per transaction. For a more detailed analysis on this and on the Access Possibility Frontier refer to Beck and Torre (2006) and Porteous (2005).

vancement in information and telecommunications technology, a noticeable improvement in road infrastructure, or a palpable reduction in general insecurity as well as efficient cost management would be required to shift the supply schedule from a low sub-optimal equilibrium to a higher level. This will lead to an extension of financial services to remote locations and to marginal customers thereby facilitating supply-induced broadening of access.

The issue stated above is to what extent each of these state variables are important in driving a bank to open a branch in a community, keeping all other things as bank strategic decisions constant. We thus hypothesise that: Geographic exclusion or banks' decision to open or close a bank in rural community is highly associated with existing state variables such as: macro-economics fundamentals, market size, physical infrastructure, available technology, contractual and informational framework and general level of security in the area. As shown hereafter, we have mathematically attempted to capture banks' decision to open or not to open a branch.

2.2 Empirical Analysis of Banks' Location Decision

Following the framework described above, we attempt to empirically explain the decision point of whether a bank will locate in a community or not. The underlying assumption of this specification is that the bank's decision to open a branch is purely based on external factors and has nothing to do with either idiosyncratic cost management or its own internal business strategy. Even though we implicitly recognise internal factors such as idiosyncratic and operational cost as important factors that could affect bank branch placement decisions, these factors are mainly within the control of management and can be kept at the barest minimum assuming banks operate efficiently or the associated risk diversified to mitigate losses. However, the above assumption is made because as mentioned earlier, these external factors are the state variables that are largely outside the control of managers of financial intermediaries. These factors do not only change slowly over a long period of time, but most importantly also typify the level of systemic risk present. According to Beck and Torre (2006), regardless of its origin, systemic risk hinders the provision of financial services because it raises the default probability and the loss given default for all credit contracts written in a given jurisdiction. It also exacerbates agency problems that increase idiosyncratic cost within a given financial institution. These external factors as mentioned in the theoretical framework above, include market size, macroeconomic fundamentals, available technology, the average per capita income, and system-wide costs of doing business associated with the quality of trans-

port and communication infrastructure, the effectiveness of the contractual and informational frameworks, and the degree of general insecurity associated with crime, violence, terrorism etc.

We thus assume simply that for an individual financial institution i, the total revenue (P*) that it is earning prior to expanding its branch to a new location is a function of a given state variables in the present location, holding all other things constant as given below:

$$P_i^* = \beta X_i + \varepsilon_i \qquad [1]$$

Where, the variable X_i is a vector of explanatory variables that includes such state variables noted above. Assuming further that if the bank opens a branch in a new community, the total revenue or benefit it earns will depend on the available state variables at its new chosen location and the existing state variables in the present location of its branches as stated above. This is shown below as:

$$\pi_i^* = \gamma X_i' + \varphi X_i + \upsilon_i \qquad [2]$$

Where, X_i' represents the level of the state variables in the new location.

Again, opening a branch entails setting up, switching and operating costs. Assuming that the system-wide cost of doing business or providing financial services in the new location also depends to a large extent on the available state variables as relate to the quality of transport and communication infrastructure, the effectiveness of the contractual and informational frameworks, and the degree of general insecurity associated with crime, violence, natural disaster etc. so that the projected differential cost, C*, which includes the extra fixed cost for opening and operating a new branch is given below as:

$$C_i^* = \lambda Z_i + e_i \qquad [3]$$

Where, Z_i relates to the available state variables that drives differential cost in the present location.

As previously mentioned, it makes sense for a bank to open an additional outlet whenever the projected differential benefit from a new branch is at least as high as the differential cost of establishing the branch or the evaluation of the Net Present Value of the future returns is positive in the long-run. We therefore assume that the bank will open a branch in a community and reach out to new customers if and only if the projected differential benefit (given as π* - P*) is greater than or equals to the projected differential cost C*, otherwise, the firm will not have any incentive to penetrate to a new area if the differential cost is greater than the differential benefit in the long run. The net benefit (Y*) is then specified as follows:

$$Y^* = (\pi^* - P^*) - C^* \qquad [4]$$

Substituting equation [1], [2] and [3] into equation [4], we simplified as follows:

$$Y_i^* = \gamma X_i' - (\beta - \varphi)X_i - \lambda Z_i + (\upsilon_i - \varepsilon_i - e_i) \qquad [5]$$

Again, given the assumption that both revenue and cost depend on the level of state variables (W) of the respective bank locations, it stands to reason that X_i', X_i, and Z_i can be identified to be at different levels of state variables that can be aggregated into W_i. Thus we have the reduced form of equation [5] as:

$$Y_i^* = \delta X_i' + \mu_i \qquad [6]$$

Where, $\delta = \gamma - \beta + \varphi - \lambda$ and $\mu_i = \upsilon_i - \varepsilon_i - e_i$

From equation [4], inferring from profit maximization condition of the firm will mean that a bank will only open an additional branch in a new location, all things being equal, if the net benefit Y^* is such that, $Y^* \geq 0$, Otherwise If $Y^* < 0$, then the bank does not open a branch in a new community.

Since Y^* is unobservable and is based on latent regression, we cannot treat this equation as an ordinary regression (Greene, 2003). A bank has either actually opened a branch in a new location or it has not. If there is a bank we can assume to observe the former condition, $Y^* \geq 0$, if there is no bank then the latter $Y^* < 0$ is assumed to prevail. Thus Y^* takes a binary choice variable i.e. Y= 1 for the presence of a bank branch and Y= 0 for no bank branch in the whole community. If the error term, μ (which represents unobserved heterogeneity at the community level), assumes normal distribution or logistic disturbance, then a Probit or Logit model is applied to the equation [6] in order to estimate the probability that a bank will open a branch in a community given the existing state variables.

2.3 Towards Defining the Problem of Socio-Economic Exclusion Underlying Demand for Banks Deposit Account

In microeconomic theory, price and income are very important factors that determine demand for quantity of goods and services. However, demand for financial services goes far beyond such economic factors. Both economic and non economic factors have been shown by various other studies to be equally important. This section also draws on the Beck and Torre (2006)'s APF for basic financial services to develop a simple analytical framework for both market and non market factors that attempts to explain why

some people are excluded from the mainstream financial services. Simply, we analyze here factors that drive household's demand for basic bank deposit accounts. This framework is also quite similar in spirit to a framework developed by Wai (1972) and adopted by Amimo et al. (2003).

The framework for model Specification

Following the studies mentioned above, we begin by distinguishing between pure demand and actual demand factors to explain self exclusion as well as demand factors based on ability to hold bank deposit account and having the opportunity to hold it.

Pure Demand

The fundamental theorem of demand states that the quantity demanded of a good falls as the price (P) of the good rises. In addition, as the income (Y) of the individual rises, demand increases, shifting the demand schedule higher at a given price. This is also true for demand for financial services. Similarly, as people's incomes increase, the need to have a secured place for safe custody also increases. However, as the price or the fee increases the quantity of financial services demanded falls. Thus, we express pure demand for financial services as:

$$D^* = f(P, Y) \qquad [1]$$

Actual Demand

Besides the market or economic forces that drive demand, other demand reducing non-market factors such as socio-cultural, religious and financial illiteracy are also important. These factors often lead to self exclusion because of such people's inability to recognize the benefits of having a bank account or harboring negative beliefs about the use of financial services. This means that the actual aggregate demand for bank deposit account at any given time for a country will be less than what the market demand factors would have predicted:

$D^* > D$, where D is actual demand driven by factors both market and non market demand reducing factors as expressed below:

$$D = f(P, Y, C, R, L) \qquad [2]$$

Where, D is the actual demand for bank deposit account, and C, R and L represent Cultural or Ethnic background, religion and literacy status respectively.

Ability to Use and Opportunity to Hold Deposit Account

We further argue that just acquiring deposit account is not enough to integrate one into the mainstream financial system. It is interesting to note that the "banked" are supposed to be fully integrated into the mainstream financial sector by virtue of having a checking or savings account, whereas the unbanked are on the fringes, completely excluded from the traditional or mainstream financial system, and lack an account of any kind. Nevertheless, in between the two terms are what is called the "under-banked" or the 'pseudo-savers' described as people who have a bank deposit account but make very little use of it or do not use at all[8]. The ability of a household to demand and utilise or keep the account active does not only depend on actual demand function specified above but principally also, on the liability, the age of the head, dependency ratio, employment status as well as physical assets of the household. The ability of the household to hold bank deposit account is therefore expressed as:

$$W = f (L, Ag, Pa, G, E) \qquad [3]$$

Where, W represents the ability of the household to demand and hold a bank deposit account, and L, Ag, Pa, G and E represent liability, age of economic head, physical assets gender and employment status respectively.

Opportunity to own an Account

Finally, on the issue of having the opportunity to hold an account, we argue that just willing and having the ability to hold an account is not sufficient to guarantee it. There should be availability of financial institution. The longer the distance to a bank the higher will be the transaction cost for holding an account. Thus high transaction cost involving travelling to a particular delivery services or lack of opportunity to bank alone has the potential of discouraging one from owning a bank account. Thus transaction cost, **T**, all things being equal, is a function of the proximity and easiness of accessing banking services, **Pr**. This can also in turn affect demand for bank deposit account, **D**. This can therefore be expressed as follows: T = Z (Pr);

$$D^1 = F (T) = F \{Z (Pr)\} \qquad [4]$$

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[8] Seidman et al. (2005) observe that most discussions about the financial services practices of low- and moderate income consumers have proceeded as if these consumers fit neatly into two mutually exclusive categories, the banked and the unbanked. To them, engagement in the mainstream and alternative sectors by low and moderate-income households should be thought of as a continuum rather than a simple dichotomy of banked and unbanked.

Putting together equations (3) and (4) into the actual demand equation (2), we specify the model as:

$$D = f (P, Y, C, R, L, Ag, Pa, G, E, Pr) \qquad [5]$$

Empirically however, we cannot observe households' demand for financial services, but we can observe whether household has a bank deposit account or not. The equation 5 therefore becomes a binary choice function where the dependent variable D representing demand, takes on the value one, if any member of the household has a bank account, and zero otherwise. Detail descriptions of the explanatory variables are discussed in section 3.2 below.

3. DATA SOURCE AND VARIABLE DESCRIPTIONS

The data for this study is derived from the Ghana Statistical Service's latest round of Ghana Living Standards Survey (GLSS 5) between September 2005 and September 2006 and launched in 2008. The GLSS 5 is a multi-purpose survey of households in Ghana, which collects information on the many different dimensions of their living conditions. This data, which are collected on a countrywide basis, surveyed 396 communities in the rural areas and a nationally representative sample of 8687 households. The survey covered a plethora of variables that include rural community characteristics, households' demographics, transfers, basic physical and financial assets, employments, health, education etc.

3.1 Variables Description: The Supply of Basic Banking Services

Following the econometric framework of banks' location decision in section 2.2, the dependent variable Y^* in equation (6), is a binary response variable taking the value one, if the community has a bank and zero otherwise. The Variable, W is a vector of explanatory variables representing the level of state variables in the community as discussed in the framework above. At this stage we grouped these variables into four main thematic factors believed to influence banks branch placement decision as: the expected demand, the level of urbanization and modernization, the market activeness and the perceived risk and insecurity in the community. These are discussed below as:

1. **Expected demand for financial Services:**
   - **Poverty and income levels:** In view of the fact that commercial banks are profit oriented and are mainly in business to mobilize savings and advance credit they are more likely to avoid areas where poverty levels are high and per capita incomes relatively very low. Banks often consider the poor as highly risky clients and transactions involving smallholders are as also costlier. We represent the level of poverty in the community by two main variables: the first is the average household per capita income in the community and the second is the percentage of literate population in the community basing both proxies on the household survey data. We expect the signs on the variables to be positive.
   - **Market size:** As mentioned earlier, the fixed transaction cost is one of the main constraints to supplying financial services and one way to surmount it is either through sufficiently high value or high volume transactions. However, because of low incomes, the former is almost non-existent in a rural community. The best option therefore is large volume transactions that will reduce per unit cost through scale economies. Thus we hypothesized that banks are more likely to locate in areas where the potential market size is big enough to ensure economies of scale. We use the size of the community population to proxy for the market size and expect the sign to be positive.

2. **The level of Modernization and Urbanization:** Earlier studies have shown that commercial banks are generally located in areas that are more urbanized or benefit from improved infrastructure[9]. Thus based on the available data we hypothesized that banks are more likely to place a branch in areas where the following physical infrastructures are present:
   - **Energy:** Since most areas in rural communities are not connected to the national electricity grid, presence and reliable energy source will be an important factor in placing a bank. We assigned the value 1, if the community is connected to the national electricity grid and zero otherwise.

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[9] Beck et al. (2007b) providing evidence on cross country study, explore the association between banks' outreach indicators and infrastructure development, and in particular, find that greater outreach is correlated with standard measures of financial development, and better communication and transport infrastructure and better governance. In similar studies cited in Sharma and Zellar (1999) find that commercial banks in Bangladesh and India favor well-endowed areas, and more likely to be located in places where the road infrastructure and marketing system are relatively developed.

- **Transportation:** The status of the road network and the quality of the transportation system are important in the system wide cost of doing business, which also increases transaction cost of financial service provision. Taking the value of 1, if the community has good motorable roads throughout the year and 0 otherwise, we expect banks to go into areas where the road network is good.
- **Communication:** modern banking requires easy access to and efficient communication and information technological platform. Thus banks are more likely to go to such areas where communication services exist such as telephones or internet services or to the barest minimum a post office. Proximity to the nearest phone center is used to proxy for communication thus expecting a negative relationship. The post office is a dummy variable taking the value 1 if the community has a post and zero otherwise.
- **Education and Health Infrastructure:** since the staff of banks will normally be staying in these communities the availability or proximity to such social infrastructure will enable banks to attract skilled personnel for efficient service delivery. We use distance from the community to any health post whether a hospital, clinic, pharmaceutical etc. in the community. We represent the education variable by the value 1, if there is a Junior High School in the community and 0 otherwise.

3. **The level of Economic Activities:** An active and more commercialized community is more likely to attract banking services because of the high demand that businesses and players alike will place on them. We use the following as proxies for commercialization:
   - **Market Activeness:** this takes the value of 1 if the community has a permanent or periodic market day and 0, otherwise.

4. **Major Economic Activity:** this is assigned the value of 1 if the main economic activity of the area is agriculture and/or other primary/extractive activities and 0 if it is generally trading. We expect the sign to be negative. This is because farming in these communities mainly depends on the vagaries of the rainfall. As a result, most farming communities are "dead" or inactive during the dry or non harvest seasons. The situation often results in low and fluctuated incomes for most farmers or rural dwellers. This does not only reduce the economic activities, but also increases the risk of doing business by banks in these areas.

5. **Insecurity/Risk:** the degree of general insecurity associated with crime, violence, natural disasters such as flooding, ethnic conflicts, chieftaincy

Table 1: Summary Statistics (Determinants of Bank Branch Location Decision)

Variable	Description	Mean (Percentage)	Expected Sign
Bank (Y*)	= 1, if the community has a bank = 0, otherwise	(5.3)	
Proximity to a Bank (Y)	Kilometre distance to the nearest bank	11.1	
Perceived Insecurity/Risk	= 1, if the community is perceived to have risk factors as in crime, natural disasters etc; = 0, otherwise	(52.5)	–
Transport/Road Status	= 1, if the road network is good all year round; = 0, otherwise	(52.5)	+
Economic Condition	= 1, if the community perceived their standard of living has improved in the last 10 years. = 0, otherwise	(39.2)	+
Major Economic Activity	= 1, if the main occupation of the community is agricultural or primary related. = 0, if it is trading	(33.8)	–
Market Activeness	= 1, if there is a permanent or periodic market; = 0, otherwise	(27.0)	+
Energy	= 1, if the community has electricity; = 0, otherwise	(33.8)	+
Post Office	= 1, if there is post office, = 0, otherwise	(3.0)	+
Maj. Ethnic group	= 1, if the community belongs to the major ethnic group = 0, otherwise, 0	(40.7)	+
Health	= 1, if there is hospital/clinic/health post; = 0, otherwise	(42.9)	+
Education	= 1, if there is Junior High School in the community, = 0, otherwise	(46.7)	+
Per capita income	Average households' per capita income of the community	2583204.6	+
Market size	The population of the community	823.1	+
Communication	The kilometre distance to the nearest communication centre	22.1	–
Literacy	Percentage of literate based on household data	0.6	+

Note: *Figures in parentheses indicate percentage.* household income is denominated in the local currency, cedi ($1=C9200 at the time of the survey)

disputes etc. will be of great concern to any commercial bank and thus factor it in deciding whether to site a bank or not in a particular place. They are therefore more unlikely to go to areas that are perceived to be highly vulnerable to such security risk factors and their covariates. The variable takes the value 1, when people in the community perceives that any of the above risk factors is present or a possibility and 0, otherwise. In order to control for ethnicity, we also included in the model a binary variable taking on the value 1, if the community belongs to the main ethnic group and zero if it is in the minority. Table 1 below shows a summary description of all the variables in the determinants of bank branch location model.

3.2 Variable Description: Demand for Bank Deposit Account

Dependent variable

From the bank deposit account framework in section 2.3, demand for bank deposit account is unobservable but having a bank account is observable. As such the dependent variable (D) is a binary choice variable taking the value 1 if any member of the household has a bank deposit account, and zero otherwise.

Explanatory Variables

Following the theoretical framework discussed above we classify the explanatory variables into four thematic groups as market factors, non-market factors, ability to hold and maintain an account and the opportunity to have a bank deposit account. The following is the description of the explanatory variable:

- **Market Factors:** these constitute the pure demand factors where demand for bank deposit account is a function of economic factors such as income and price. We use household total income including incomes from agricultural and non-farm activities, employee compensation, transfer etc. We expect that the more income the household has, the more likely the household will demand a secure place to save the money. We use inflationary rate (measured by the price index of the district where the household resides) to proxy for price. Since high inflation erodes the future value of saving all things being equal (i.e., if deposit or saving interest rates remain flat over the inflationary period), we expect household to save in real other than financial assets thereby having little or no incentive to demand a bank account in inflationary periods.
- **Non-market Factors:** these are demand-reducing non economic factors

often driven by self-exclusion problems such as households' cultural /ethnic and religious orientation as well as financial illiteracy. We believe that certain cultural, ethnic or religious practices or beliefs especially from the minority barred some group of people from holding financial assets thus having less desire to hold a bank deposit account. The ethnicity variable takes the value one if the household belongs to the major ethnic group (Akans) and zero otherwise. The religious variable takes the value 1 if the dominant religion within the household is the majority, Christianity and zero if it is in the minority. We use household educational endowments to proxy for the level of financial illiteracy. We hypothesized that households with no or little education are likely to be financially illiterate and may not know the benefits or understand the workings of the financial system and thus would demand less or nothing of it. This is done by adding the number of years each household member spent to complete the highest grade attained in school. We believe that one year increase in the number of years any household member spent in school will increase the likelihood of demanding a bank deposit account thus having a positive outcome.

- **Ability to hold bank deposit account:** Apart from the income of the household, we think certain factors such as the debt, physical assets, household size and some household demographic factors such as age, gender and the employment status of the economic head of the household may also determine whether the household will have the ability to demand and hold a deposit account. The variable debt is a proxy for the liability of the household which takes on the value 1 if the household owned money from any source, and zero otherwise. The expected sign on this debt is ambiguous because high debt burden may mean that household will think very little about saving and thus will be less inclined to demand a bank account. On the other hand, if the household demands a loan from the formal banking sector, then opening a deposit account is a prerequisite to qualify for a loan.

Other factors believed to affect household ability to hold a deposit account are the physical assets of the household. Physical assets range from durable consumer assets such as cars, house, land, household appliances, etc, to agricultural assets such as livestock and equipments. Many studies have predicted a positive relationship between the physical wealth of the household and the demand for financial savings[10]. However, we believe the

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[10] Amimo, et al. (2003).

sign could be indeterminate in that physical assets could be either a substitute or a complement to demand for financial savings. It serves as substitute if households prefer to save in real stocks such as livestock or buying lands instead of financial assets and thus are less likely to demand bank deposit accounts. On the other hand, physical assets become a complement if the household saving behavior depends on assets that can easily be converted into cash thus showing a positive relationship.

The ability to hold a deposit account is also believed to be influenced by the household size as a proxy for dependency. Our data shows a high positive correlation (0.89) between the household size and the number of dependants (i.e., non active members of the household). High dependency means high household consumption and fewer saving thus less likelihood to demand a saving account. The age of the economic head of the household is also expected to influence the probability of demanding a bank deposit account for saving. We expect young household heads to have a higher probability of demanding a bank deposit account than their older counterparts. This is consistence with the life-cycle hypothesis, which postulates simply that individuals save while they work in order to finance consumption after they retire.

Another household characteristic that may explain the demand for a deposit account is whether the household economic head is a female or male as a proxy for gender. A female household head is expected to be less inclined to hold a deposit account as against her male counterpart. Again, in line with other studies (Amimo *et* al. 2003; and Zellar and Sharma 2001) we included an employment dummy variable to capture the socio-economic status of the household, which is believed to also influence household engagement with banking institutions. We categorized household into either formal or informal (which includes, self-employed, farmers etc) based on the head's main occupation. We also included a remittance variable to test whether households who receive remittances from either locally or abroad are more likely to demand a bank deposit account.

6. **Opportunity to hold a bank deposit account:** this variable captures the proximity (in kilometers) to any bank and represents the transaction cost of holding a bank deposit account. The farther a household is away from a bank the less likely they will demand a financial service from a bank because of the travel time, the risk and cost involved in operating the account. We note here that because of the limitation in data, this variable is only included in the rural model to test the hypothesis. It is also somewhat justifiable because in most of the urban areas the opportunity to

bank is not a problem since most of the banks are present in all the urban areas. However, we included an urban-rural location dummy variable in the overall model to capture whether there is a significant difference between rural and urban responses in respect to banking. The table 2 below shows a summary description of all the variables in the determinants of demand for the bank deposit account model.

Table 2: Descriptive statistics: Demand for Bank Deposit Account Model

Variable	Description	Mean (Percentage)	Expected Sign
Bank Deposit Account	= 1,if any household member has a bank account = 0, otherwise	(27.5)	
Age - Head	The age of the economic head of the household	45.3	+
Age square	The age square of the economic head	2067.3	–
Education Endowment	Addition of number of years each household member spent in school	15.6	+
Dependency	This represents the household size	4.2	–
Price	The price index of the community of household	3.4	–
Income	Total household income	11753099.2	+
Employment status	= 1, if main occupation is formal; = 0, if informal	(14.5)	+
Ethnicity	= 1, if household belongs to the majority ethnic group = 0, if in the minority	(38.9)	+
Gender	= 1, if household head is female; = 0, male	(37.9)	–
Liability	= 1, if any household member owned money from any source = 0, otherwise	(26.3)	+/–
Religion	= 1, if household belongs to the majority religion; = 0, otherwise	(71.1)	+
Remittance	= 1, if household received remittances from overseas	(52.7)	+
Total physical assets	Total physical wealth of the household including farm assets	35238602.4	+/–

Note: * Figures in parentheses indicate percentage.* household income and physical assets are denominated in the local currency, cedi ($1=C9200 at the time of the survey)

4. ESTIMATION RESULTS AND DISCUSSION: SUPPLY OF BASIC FINANCIAL SERVICES OR BANKS' LOCATION DECISION

Table 3 reports the results for probit estimation of equation (6) where the dependent variable takes the value of one, if the bank branch is located in a community and zero otherwise. All the model fitting information shows that the models were well specified. For robust check, we applied the linear regression model (Ordinary Least Square method) to the explanatory variables where the dependent variable is the community's proximity to a bank which was measured as the inverse of the kilometer distance to a nearest bank[11]. Both results are presented in the table 3. The results present interesting findings. The result on *market size* variable is robustly significant and with expected positive signs in both estimations. This indicates that banks are more likely to place a branch in communities where the size of the population is large irrespective of the levels of income or poverty as long as it can take advantage of economies of scale. This result is not surprising in that the communities in question here are rural and the fact that poverty in Ghana is a rural phenomenon; banks will be unwilling to go to such places because of low value transaction resulting in high fixed transaction cost. As the theory suggests, unless banks can take advantage of scale economies and network externality to reduce per unit cost of production, they will not locate a bank in a rural area. This result also reveals that banks in Ghana are very particular about fixed transaction cost in locating a bank unless the expected demand or population size is large enough to ensure economies of scale. The result again implies that with the sparsely populated nature of the rural dwellings the issue of geographic exclusion of financial services could persist for a long time unless a more cost effective means of delivering financial services to the rural population is adopted.

Concerning the variables representing the levels of urbanization and modernization, it appears that placement decisions are more responsive to availability of energy and communication facilities than transportation and post office. *Energy* is robustly significant suggesting that banks are highly likely to place branches in areas where there is electricity. Even though *communication* is not significant in the Probit model it shows up strongly significant in the proximity equation. The result suggests that each kilometer a

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[11] We took the communities that have a bank branch located in their area to have the minimum distance less than 0.5 kilometres. This then obviously gave us the highest figure when the inverse was taken with longest distance becoming the smallest. What this implies is that the dependent variable will have the same expected increasing or decreasing function with the explanatory variables as expected in the Probit model to make comparing easier.

community is away from a communication centre reduces the possibility of a bank placing a branch in the locality by 1.3 percent. Social Amenities such as hospitals and schools however, do not appear to play any role in bank branch placement decisions since both proxies are insignificant.

On the issue of the level of economic activity in the area, it appears that banks are more interested in areas where the economy is active in terms of marketing rather than the kind of occupation the communities are engaged in. The coefficient on *market activeness* is positively significant and robust suggesting that banks are more likely to place a branch in areas where they have permanent or periodic market days. However, whether a community is mainly engaged in agricultural related activities or trading does not appear to influence banks' decision to place a branch in a locality even though the negative sign attached, which was expected, may suggest they are more tilted towards trading. Perception about whether the *economic condition* has improved in the last 10 years surprisingly shows significantly negative sign in both regressions. This result is perhaps more striking because one would have expected the banks to be more responsive to areas where the economic condition has improved over the years. However, it could mean that banks location decisions have nothing to do with perception or communities' economic condition and as the results show, they are rather more interested in other factors such as market size, market activeness etc.

The coefficient on *insecurity/risk* variable is significant with the expected negative sign. This suggests that banks are less likely to go into distress communities that are perceived to be highly risk- prone in terms of crimes, conflicts, natural disasters etc. This result is also suggestive of the fact that banks in the country are not ready to take risk and deal with it or do not have the capacity to do so. Another variable, *ethnicity*, does not appear to significantly explain banks' placement decision even though it has the expected positive sign.

In a nutshell, commercial banks' branch placement decisions in rural communities of Ghana indicate to be strongly influenced positively by the market size, urbanization and modernization in the area of infrastructure development such as energy and communication facilities, market activeness etc. but negatively by the general level of insecurity associated with crime, conflict, natural disasters etc. Being consistent with the Access Possibility Frontier (APF) analytical framework, the results explain that the high level of geographic exclusion of financial services in many communities is mainly due to the low level of such state variables. This reflects supply constrained sub-optimality due to high fixed transaction costs because of the system inability to take advantage of scale economies.

Table 3: Results of the Determinants of Bank Branch Placement Decision

Variable	1. Presence of a Bank (Probit Model)		2. Proximity to a Bank (OLS estimation)	
	Coefficient	T. Value	Coefficient	T. Value
Communication	-0.009	-0.472	-0.013***	-5.352
Market Activeness	1.022**	2.753	0.138*	2.002
Economic Condition	-1.020*	-2.055	-0.270**	-2.466
Educational Facilities	-0.131	-0.396	-0.042	-0.731
Energy	1.179**	2.415	0.252***	3.536
Ethnicity	-0.349	-0.899	0.119	1.657
Health Facilities	-0.006	-0.677	-0.001	-1.084
Literacy	-1.198	-1.037	-0.066	-0.382
Major Economic Activity	-0.315	-0.819	-0.079	-1.288
Market size	1.529***	3.151	0.302***	3.795
Per Capita Income	-0.182	-0.455	0.094	1.614
Post Office	0.801	1.519	-0.014	-0.082
Security/Risk	-1.260**	-2.466	-0.179	-1.681
Transportation	0.319	0.935	0.073	1.249
Constant	-4.274	-1.554	-0.686	-1.575
Number of observation	393		393	
R- square			0.242	
-2 Log likelihood	34.886			

*** = significant at 1%; ** = significant at 5%; * = significant at 10%

4.1 Estimation Results and Discussion: Demand for Bank Deposit Account

The results of probit model estimation for the demand for bank deposit account are presented in the table 4 below. Table 4 contains the results of the overall data estimation and a split data of urban and rural. This was done in order to capture location specific differences in responses because the urban/rural dummy in the overall data estimation shows there is significant difference at the 5 percent level. Beginning with the market or economic factors (i.e., income and price) that affect household demand for basic bank account, these results are very consistent with the model expectation. *Income* is positively significant but only in the urban area. This means that in the urban area households with higher income have a high probability of demand-

ing bank account, but not so in the rural area. A plausible reason for this out-come may be that for rural areas, because of the general levels of very low income, there is not much variation in income levels among households, thus there are no significant differences in income driven demand. Neverthe-less, the positive relation between income and demand for bank account in urban areas is consistent with the classical Keynesian theory stating that the relationship between income and saving is linearly positive.

Price, represented by the price index of household's location, has an ex-pected negative sign and is robustly significant in all the estimations. This indicates that households are less likely to demand bank deposit accounts in areas where inflationary rates are high. This result is not only consistent with the basic law of demand, but also indicative of the fact that households are very sensitive to the low deposit rates offered by banks and the erosion of the value of their savings during inflationary periods. Often the real deposit rate shows up in the negative because of the very low or even zero in some cases and almost pegged nominal rate by the banks in the country.

The results on the non-market demand reducing factors or self-exclusion factors (ethnicity, religion and illiteracy) are all robustly significant with the expected signs in all the three estimations. The *education* variable, which proxy the level of financial illiteracy and represented by the household edu-cational endowment, indicates strongly that financial exclusion in the coun-try can be explained by the level of illiteracy or financially illiterate. House-holds with low level of educational endowments are less likely to demand a bank deposit account irrespective of its location. The results also show that the minor ethnic and religious groups are the unbanked and the excluded. The positive sign on both variables indicate that households belonging to the majority ethnic and religious groupings are more likely to demand bank ac-counts as against those in the minority. This is in line with self-exclusion be-liefs of certain minority religious groupings in the country.

On the issues of household's ability to demand and hold deposit account which focus on physical wealth, liability and household's demographic char-acteristics present interesting findings but generally as expected. The *Physi-cal Assets* that proxy for the accumulated wealth of the household is signifi-cant and positive. This indicates that households with greater accumulation of physical assets such as consumer durables, land, livestock etc. are more likely to demand bank deposit accounts. This implies generally that physical assets are complementary to financial savings and not substitutes as it has been the belief of many economists. This implies that the amount of house-hold holdings depends on assets that can easily be converted into cash (Ami-mo, 2003). The finding is also consistent with Aryeetey (2004), who con-

cludes that even though households generally have a preference for productive assets over financial assets, the composition of these is strongly correlated with their wealth positions.

The *Loan* variable (i.e., whether household owned money or not) proxy for household liabilities shows up positive and robustly significant in all three estimations. This is interpreted to mean that households with bank or owned money are more likely to demand bank accounts than those without. This is not surprising in that most banks, prior to granting a loan request, would require the applicant to open a saving account with it in order to establish a client relationship.

The results on household demographic characteristics are rather more interesting. *Age* of the economic head of the household has somewhat conflicting results. Surprisingly, the *age* variable is negative and significant in all the three estimations, whiles the *age squared* variable is positive but insignificant in all the estimations. This is in contrast with our expectation as we assumed age to follow a quadratic function with diminishing marginal effect consistent with the life-cycle hypothesis. However, negative sign on the age variable could also somewhat be interpreted in a similar fashion. This means that as the head of the household advance in age, the less likely is he or she to demand a bank deposit account. They are likely to consume more in retirement than to save.

Household size proxy for dependency ratio has the expected negative sign and robustly significant in all three estimations. The higher the dependency ratio, the less likely the household is to demand a bank deposit account. This is not surprising because high dependency means that the per capita income of the household is very small relative to consumption thus very little or nothing at all is left for savings. The *gender* of the household head is surprisingly not significant with varying signs. This means that gender does not explain a demand for bank deposit accounts or a financial exclusion in Ghana. On the issue of whether household who receive remittances are likely to demand bank account, the result appears to be the contrary. The *Remittance* variable is significant with negative sign but only in the urban estimation. This means that households without remittances are rather more likely to demand a bank account. This is somewhat surprising. However, it could also mean that in urban areas the majority that receive remittances are the relatively poor segments of the households who by virtue of their low income, low education, sometimes joblessness, are less likely to be banked. Again, most of these remittances are sent through relatives and friends or private agents such as Western Union who do not normally require recipients to open a bank account.

The *employment status variable* proxy for whether the household's main occupation is in the formal or the informal sector is also robustly significant and with the expected sign in all the estimations. This is not surprising since those who work in the formal sector are often paid through the banks and thus are very more likely to demand a bank account. This result is also a confirmation that the large segment of the population who is unbanked lies in the informal sector which constitutes more than 80 percent of the working force.

The sign on the *proximity* variable which proxy for opportunity to bank and which, as mentioned earlier, is only included in the rural estimation is significant with the expected negative sign. It suggests that the farther a household is away from the nearest bank the less likely it will demand banking services. This variable, which also represents transaction cost, implies that a high transaction cost is a disincentive to operate a bank account. When an urban/rural dummy was included in the overall dummy it appeared to confirm this finding. The sign is positive indicating households that are situated in the urban areas are more likely to bank as against their rural folks. One is tempted to think that because there is a high concentration of banks in the urban areas access to banks is easy and less costly.

In conclusion, financial exclusion in Ghana or demand for basic banking service such as deposit account can be said to be explained by both market and non-market factors as well as opportunity to bank. However factors such as price, illiteracy, ethnicity/religion dependency ratio, employment status, physical wealth and liability of the households as well as proximity to a bank appear to be very important in driving financial exclusion.

5. CONCLUSION

This paper has attempted to investigate the drivers of financial exclusion in Ghana by focusing on two main types of exclusions:geographic exclusion and exclusion based on household socio-economic conditions. In particular, the study examines the determinants of bank branch location decision in rural communities and household's demand for basic financial service as bank deposit account. Using a unique community based characteristic survey and nationally represented households survey data set from Ghana, this study is theoretically underpinned by an access possibility frontier conceptual framework that identifies different demands and supply sub-optimal constraints to broad access to formal financial services.

The study's major findings are consistent with the existing theoretical and empirical literature. On the determinants of bank branch location deci-

Table 4: Estimation Result for Demand of Bank Deposit Account

Variable	All		Urban Model		Rural Model	
	Coefficient	T- value	Coefficient	T-value	Coefficient	T-value
Age -head	-.297***	-3.537	-.312*	-2.410	-.278**	-2.470
Age square	.086	.973	.076	.542	.068	.585
Household size	-.020**	-2.822	-.045***	-3.255	-.009	-1.018
Proximity					-.004**	-2.446
Education	.262***	10.277	.325***	6.930	.264***	8.087
Employment status	.558***	12.449	.464***	8.411	.769***	9.497
Ethnicity	.123***	3.555	.063	1.593	.143***	2.845
Gender	.050	1.402	.094	1.752	.009	.183
Income	.030**	2.525	.050**	2.929	.009	.507
Loan	.172***	4.802	.136**	2.478	.228***	4.723
Urban/Rural	.208***	5.824				
Physical Assets	.182***	11.915	.266***	11.217	.155***	7.260
Price	-.186***	-4.508	-.252***	-5.589	-.089	-.614
Religion	.172***	4.012	.245***	3.672	.116*	1.998
Remittance	-.036	-1.074	-.113**	-2.342	.004	.092
Constant	-1.469***	-5.720	-1.683***	-4.787	-1.542**	-2.683
Number of observation	7411	7933.703	3379	3944.138	4032	3951.379
-2Log likelihood						

*** = significant at 1%; ** = significant at 5%; * = significant at 10%

sion, the study findings indicate that bank outreach to a rural community is strongly influenced positively by the expected demand represented by the market size, urbanization and modernization in the area of infrastructure development such as energy and communication facilities, market activeness within the community. However, it is negatively influenced by the perceived general level of insecurity associated with crime, conflict, violence, natural disasters etc. In the APF framework these findings reflect supply constrained sub-optimality due to a high fixed transaction cost because of the banking system inability to take advantage of scale economies.

Considering the fact that most rural communities in the country are sparsely populated with low level basic infrastructures, then the issue of financial inclusiveness or broad access to financial services remains a big challenge.

On the demand side, the study finds that household demand for financial services can be explained by the following market and non- market factors. We find a significant positive relationship between income and demand for bank deposit account but only in the urban area. This means that in the urban area households with a higher income have a high probability of demanding a bank account but not so in the rural area. Price, represented by the price index of household's location, has an expected negative sign and is robustly significant in all the estimations. This indicates that households are less likely to demand bank deposit accounts in areas where inflationary rates are high. This result is not only consistent with the basic law of demand, but is also indicative of the fact that households are very sensitive to the low deposit rates offered by the banks and the erosion of the value of their savings during inflationary periods. The education variable, which proxy the level of financial illiteracy and represented by the household educational endowment is positive and robustly significant. Household with low level of educational endowments are less likely to demand bank deposit account irrespective of its location. We find that household's physical wealth is robustly positively significant indicating that households with greater accumulation of physical assets such as consumer durables, land, livestock etc. are more likely to demand bank deposit account. This implies generally that physical asset is complementary to financial savings and not substitutes. A plausible reason for this is that the amount of household holdings depends on assets that can easily be converted into cash.

Household's demographic characteristics that are found to be important in explaining demand for bank deposit account are household size representing dependency ratio and the age of the economic head. Gender did not appear to be important. Household size has a strong negative influence on demand for bank deposit account. This is not surprising because large size means greater dependency on the active working members of the household resulting in lower per capita income relative to consumption demands thus very little or nothing at all is often left for savings. Age of the economic head however presents interesting findings. Whereas we find decreasing marginal effect of age in urban areas the reverse is the case in rural areas. In the urban estimation, age and age square have significant positive and negative signs respectively. This implies that in urban area age of the household head is positively related to one's ability to demand bank deposit account during the working years, and negatively related after retirement, which is consistent with the life-cycle hypothesis. In contrast, in rural area the younger heads of the household is less likely to demand deposit account during their working age but more likely in their retirement.

Household's employment status, ethnicity and religion are all found to be strongly significant with the expected positive sign. The sign on employment status suggests that households whose main occupations are in the formal sector are more likely to demand bank deposit account as against those in the informal sector. This is expected because those who work in the formal sector are often paid through the banks and thus are very more likely to demand a bank account. It is also a confirmation that the large segment of the population who is unbanked is within the informal sector which constitute more than 80 percent of the working force. Another interesting finding is the remittance variable which only shows up weakly significant in the urban estimation has a negative sign. This means that households without remittances are much more likely to demand a bank account. This is somewhat surprising because other studies have shown otherwise. However, it could also mean that in urban areas the majority that receive remittances are the relatively poor segments of the households who by virtue of their low income, low education, sometimes joblessness, are less likely to be banked. Most of these remittances are sent through relatives and friends or private agents who do not require recipients to open a bank account.

Finally, the study finds that proximity to a bank increases the probability of demanding a bank account. The negative coefficient suggests that the farther a household is away from the nearest bank the less likely it will demand banking services. This variable which also represents transaction cost implies that a high transaction cost is a disincentive to operate a bank account.

From these findings, the study therefore concludes that financial exclusion or the large number of unbanked population in Ghana is both a problem of sub-optimal constraints in demand and in supply. On the demand side, the study concludes that a large number of unbanked is due to lack of opportunity to bank due to limited geographic coverage of the commercial banks and household's socio-economic conditions such as low income, financial illiteracy, religious and ethnic reasons, as well as high inflation rates. On the supply side, the key constraint is the high fixed transaction cost due to the sheer cost of building a bank, , operating and maintaining branch networks to reach dispersed, low income communities with low level of basic infrastructure such as energy and communication facilities.

The study therefore recommends the following to ensure financial inclusion:

• Monetary authorities should encourage branchless banking across the country. The rationale of branchless banking as a low-cost transactional channel is to use existing infrastructure through retail agents, shop or franchise chains to minimise fixed costs and accelerate scale. Even though

branchless banking is a new phenomenon and presents a new challenge, the study believes that with little innovation, creativity and an appropriate regulatory framework its potential remains strong.

- Encourage banks to forge closer links between themselves and the informal financial services that are close to the people. For example, using the *SUSU* schemes on a large scale to open bank account for members and mobilise savings on behalf of the banks.
- Extensive promotion of financial educational programs and attractive deposit account incentives among the unbanked to mitigate self-exclusion.
- In the long term however the policy recommendation is for the government or the monetary authorities to promote market development policies that will promote competition within the banking sector and broaden outreach through structural reforms, institution building and improvement of state variables.

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Résumé

La plupart des peuples de l'Afrique sub-saharienne n'a pas un compte de dépôt et est exclue des services financiers. Cet article examine les facteurs d'exclusion géographique des services bancaires des communautés rurales et la demande des ménages d'ouverture de comptes au Ghana. Une enquête auprès des communautés et ménages révèle que les décisions d'implantation des succursales bancaires sont positivement influencées par des facteurs comme la taille et le dynamisme du marché, la qualité des infrastructures telles que l'électricité, les moyens de communication. Elles sont négativement influencées, par exemple, par l'insécurité, la criminalité, les conflits, les calamités naturelles. Inversement, les sollicitations d'ouverture de comptes pour les ménages sont à la fois liées aux facteurs commerciaux et non-commerciaux tels que les prix, l'analphabétisme, les questions ethno-religieuses, le taux de dépendance, l'emploi, le bien être et la proximité des banques.