

Access to and use of bank services in Nigeria: Micro-econometric evidence

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Abstract

This study examined the access to, and use of bank services in Nigeria using data from the World Bank Household Survey (2011) on financial inclusion. A framework was developed to situate the decision of individuals towards financial services in Nigeria. We examined three dependent variables – use of bank services, use of the account to save and frequency of bank withdrawals. Our results show that the attributes, income level, age and ICT inclination of individuals have an effect on the access to and use of bank services in Nigeria.

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1. Introduction

Financial inclusion¹ connotes an increasing access to formal financial services such as having a bank account, and using credit and savings facilities of banks. On the other hand, financial exclusion occurs when access to financial services is hampered by constraints (such as distance to financial institutions), despite the exceeding marginal benefit over the marginal cost from using these services. The latter is unattractive in an economy as its adverse macroeconomic effects are numerous and they include the reduction in aggregate savings, low domestic investment borne from reduced savings and epileptic development of the financial system.

Consensus is being reached on the benefits of financial inclusion to national development. Some of these include poverty reduction, decrease in the level of inequality and enhanced private investment (Beck et al., 2007; Allen et al., 2012). Also, financial inclusion enhances the attraction of remittances, as it eases the transfer of funds from abroad (Demirguc-Kunt et al., 2011). Needless to state, the going concern of banks depend on the extent of financial inclusion since banks require customers' funds for re-investment and bank liquidity; and because the charges on bank services rendered to customers form part of banks' overall profitability. Other gains from financial inclusion include improved household consumption and female empowerment (Ashraf et al., 2010).

Following the benefits from financial inclusion, countries are beginning to develop strategies to increase individuals' access to financial services. In Nigeria, some of the strategies recently developed by the Central Bank to reduce the 46.3% adult population currently excluded from financial services include: enhancing bank–customer relationship, electronic banking, public enlightenment about financial services and the introduction of credit enhancement schemes. Despite the appreciable effort and its consequent implications, we argue that for sustainable financial inclusion to be attained in Nigeria, there is the need for the consideration of a 'bottom-top approach' in policy formulation. It becomes imperative to understand the factors that impede/enhance individuals' access to financial services, which should inform policy action. The objective of this study is therefore to examine the extent to which individuals' attributes explain the access to and use of bank services in Nigeria. This perspective is budding and some studies that have

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¹ Financial inclusion entails access to and use of bank services. In this study, they are used interchangeably.

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attempted to follow this approach have, at best, considered a descriptive analysis of the trend of financial inclusion in African countries (Demirguc-Kunt and Klapper, 2012) and conducted surveys on the extent of financial inclusion in Nigeria (Ladipo, 2012). The shortcoming of these approaches is that they present a description of possible associations and do not clearly show the significance of the associations; therefore, clear scientific conclusions cannot be easily drawn from their findings.

Our focus on Nigeria is instructive because of the rising rate of adult financial exclusion. In 2010, only about 36% of the adult population in Nigeria – roughly 31 million out of an adult population of 85 million – operated a formal bank account (Central Bank of Nigeria-CBN, 2012). This figure, when compared to South Africa and Kenya that had about 68% and 41% adult population operating a formal bank account in the same period is worrisome, calling for an urgent inquiry into the factors that can likely improve the trend of adult financial inclusion. Nigeria, having the second largest financial industry in Africa, makes the findings from this study useful for policy action in other African countries. Presently, the rate of financial inclusion in the region is relatively low: for instance, only 55% of the adult population with tertiary education has bank accounts, but only about 10% of those with primary or no formal education in the region have bank accounts (The Economist, 2012).

The approach of this study – focusing on individuals' attributes – helps to solve two distinct problems that are popularly associated with economic analysis. The first is the problem of endogeneity, which plagues studies² that have focused on financial sector development. We are aware that Demirguc-Kunt et al. (2011) raised this issue when they considered remittances and banking sector breadth in Mexico. They argued that conclusions that are reached on financial sector development, using aggregate data are subject to at-least some form of endogeneity. This implies that the factors that explain financial sector development are also being explained by other factors. Therefore, by using survey data that contains individuals' information, as it is in this study, the possibility of the existence of endogenous variables is ruled out since the measurement errors and reverse causation are reduced.

Secondly, some of the measures used by extant studies, in measuring financial inclusion, are adjudged as problematic, overestimated and may not be robust. For instance, the popular measures of financial inclusion – number of accounts per capita, in Honohan (2008), Kendall et al. (2010), and Demirguc-Kunt et al. (2011), contain individuals who are likely to have more than one bank account. Likewise, foreigners who were not included as part of the population but own bank accounts are likely to be counted among the aggregate measure of financial inclusion. This will likely overstate the extent of access to and usage of bank services in Nigeria. Our approach, which is 'access to and use of bank services' by individuals, circumvents this problem. Apart from these identified gaps, we also accessed the individuals' level of financial discipline and ICT inclination as explanatory variables to the extent of financial inclusion; this

is because policy attention is geared towards enhancing ICT usage in Nigeria. For instance, the Central Bank of Nigeria's summary report on National Financial Inclusion Strategy 2012, clearly emphasizes on the need for ICT development of current/potential bank customers as a step towards better financial inclusion. Financial discipline on the other hand, represents the innate attributes of the individuals which are capable of affecting their decisions to engage bank services. This has been inadvertently neglected in existing literature, and which if included will give a more robust discussion on the factors affecting access to and use of bank services in Nigeria.

The remainder of the paper is distributed as follows: we presented an overview of the financial sector in Nigeria, taking note of the extent of financial inclusion. The review of literature which includes our analytical framework follows in the third section. The World Bank Household Survey on financial inclusion 2011 – also referred to as the Gallup World Poll Survey – around the world, was used in estimating our empirical model and we discussed our results with policy recommendations.

2. Stylized facts: the Nigerian financial sector

Just like other countries, the Nigerian financial sector comprises of both the money market and the capital market. The money market is where short-term financial instruments are traded and it is regulated by the Central Bank. The capital market is where long-term financial instruments are traded, with the Security and Exchange Commission serving as the apex regulatory body. The CBN has played major roles in the overall economic development of Nigeria. For instance, the regulation by the CBN to the commercial banks to set aside 10% of their profit before tax to finance Small and Medium Scale Enterprises is a vivid example of CBN's role.

Despite the development of the Nigerian financial sector, the performance metrics using the domestic credit provided by the banking sector as a percentage of GDP reveals a consistent lag when compared to the average of countries in other regions. Fig. 1 reports that Nigeria's trend has consistently remained below 50% for the period 1990–2010. On the other hand, countries in other regions had an average contribution of above 50%, except for MENA and LAC, which fluctuated slightly above and below 50% for some parts of the period. This trend is the outcome of financial services that was provided by 24 deposit money banks, 90 microfinance banks, 5 development finance institutions, 126 bureau de change, 112 finance companies (Non-Bank Financial Institutions), 98 primary mortgage institutions and 5 discount houses in Nigeria.³

Deposit money banks constitute a significant component of the Nigerian financial sector, however, their services, such as payment platforms, and savings and credit facilities; have reached just a fraction of the population. Looking at Table 1,

² See Aggarwal et al. (2011).

³ For full report, see Enhancing Financial Innovation and Access 2010 full report at <http://www.efina.org.ng/assets/Documents/EFInAFinancial-Services-Landscape-in-NigeriaFull-ReportSep-2010.pdf?phpMyAdmin=%2CwvBxPNpx0z2BcKe8h2UcHJI%2CXb>.

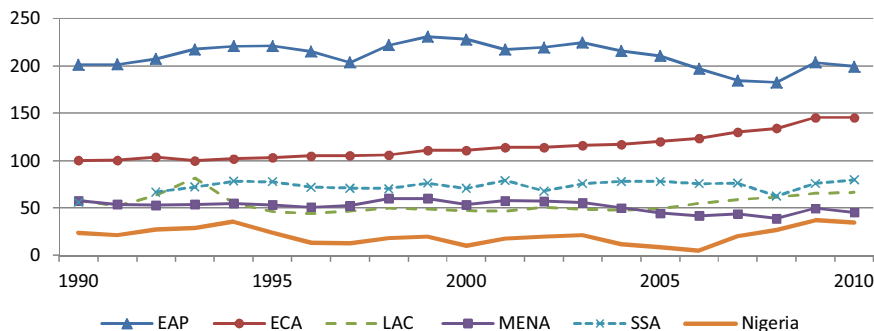


Fig. 1. Trends in domestic credit provided by the banking sector (% of GDP). Note: EAP – East Asia and Pacific, ECA – Europe and Central Asia, LAC – Latin America and Caribbean, MENA – Middle East and North Africa, SSA – Sub Saharan Africa.

Source: World Bank (2012).

Table 1
Deposit money banks and extent of outreach 2010.

Products	Extent of reach		
	Nigeria	South Africa	Kenya
Payments	36%	59%	52%
Mobile payments	0	46%	46%
Savings per 1000 people	461	638	381
Credit penetration	2%	32%	7%
Insurance	1%	30%	7%

Source: CBN (2012).

the fraction of the adult population with access to making physical cash payments is only 36%, lagging behind South Africa and Kenya. The mobile payment had not gained popularity during the period under study, as such Nigeria's extent of reach using this product was 0%, while South Africa and Kenya each enjoyed 46% usage respectively. In similar fashion, only 2% of the customers have access to formal credit, while 32% and 7% of South Africans and Kenyans have access respectively. For the savings per 1000 people, there is a total of 461 people who save in Nigeria, which is some magnitude above Kenya with 381 people, but lower than South Africa with 638 people. This is not surprising as Nigeria has a larger population than Kenya, while her financial sector is second to South Africa on the continent.

Taking this further, we compared and presented in Table 2, the trend in account ownership at a formal financial institution, between Nigeria and the average of the entire countries in SSA. Table 2 reveals that more males (33.28%) than females

Table 2
Account ownership at a formal financial institution.

	Nigeria	SSA
Account at a formal financial institution		
Male (% age 15+)	33.28	26.66
Female (% age 15+)	25.99	21.47
Primary education or less (% age 15+)	12.21	12.20
Secondary education or more (% age 15+)	44.14	39.16
Rural (% age 15+)	22.97	20.48
Urban (% age 15+)	58.65	37.90
Young adults (% ages 15–24)	21.48	17.01
Older adults (% age 25+)	33.81	27.72

Source: Authors' compilation from Global Findex (2011).

(25.99%) above the age of 15, own a bank account, which is similar to the findings of other countries in SSA (26.66 and 21.47 respectively). In Nigeria, more secondary school holders owned bank accounts (44.14%) compared to the primary school leavers (12.21%). In other countries in SSA, a similar trend was observed as secondary school leavers (39.16) had more bank accounts than primary school leavers (12.20%). As expected, more urban dwellers had accounts compared to rural dwellers. Likewise, older adults had more bank accounts compared with their younger counterparts.

Having considered the extent of outreach of financial services in Nigeria, it is glaring that a sizeable proportion of individuals are still excluded from these services. The CBN in addressing this has in its 'Maya Declaration', announced its goal of reducing financial exclusion to 20% by the year 2020. The CBN also decided to provide more support to foster the activities of microfinance banks, which serve about 5% of the banked population, by introducing stricter capital requirements in 2011 (with deadline for compliance at the end of 2012). Other strategies proposed by CBN to foster financial inclusion include: simplified risk-based tiered framework, agent banking regulations, national financial literacy agenda, consumer protection, mobile-payment system and cashless policy, introduction of credit enhancement schemes and programmes. The mobile-payment system, even though not so popular, has the advantage of cost reduction for the individual/customer, as well as ease of accessibility. Thus, the CBN licensed multiple money operators in the last two years, but only about 0.5% of the Nigerian adult population currently patronizes them.

3. Literature review and analytical framework

Financial inclusion continues to gain prominence among policy makers and multilateral institutions. An inclusive financial system, which allows broad access to financial services without price or non-price barriers to its use, is especially beneficial to the poor and other disadvantaged groups. Financial inclusion alone cannot bring about economic growth, but will contribute a quota to it (Mitchell, 2003). It is therefore vital to the growth of an economy as it opens up doors for people to access credit that they would otherwise not be able to accumulate from their savings (Demirguc-Kunt and Klapper, 2012). Banking services

represent a bulk of financial services and are the crux of financial inclusion in an economy. Bruhn and Love (2009), carried out a study to examine the effect of providing banking services to low income individuals in Mexico using the difference-in-difference strategy; their results showed that the opening of 800 branches of a particular bank (Banco Azteca) led to a rise in the number of informal entrepreneurs by 7.6%, with overall employment increasing by 1.4% and average income by about 7%.

Some other studies (e.g. Mbutor and Uba, 2013) have found out that number of bank branches that are opened by formal financial institutions may not necessarily translate to improved financial inclusion. This is applicable in countries where banks do not pursue financial inclusion as a policy objective. For instance in Nigeria, the spread of bank branches is informed by profitability of the location rather than improving access of bank services to the financially excluded. This explains why the majority of bank branches are concentrated in profitable urban locations than rural settlements (CBN, 2012). However, financial inclusion is going beyond physical branches as ICT is revolutionizing the access to and use of bank services globally. Diniz et al. (2012) noted that successful experiences with financial inclusion reported in developing countries are associated with the use of ICT based branchless banking. Explicitly, the authors noted that the Brazilian model, where ICT based network is responsible for delivering financial services to tens of millions of poor Brazilians is instructive in this regard. The findings of Demircug-Kunt and Klapper (2012) in Sub-Saharan Africa further corroborate the usefulness of ICT in enhancing financial inclusion.

From the micro perspective, the literature on financial inclusion has suggested factors that are responsible for increasing the use of financial services (such as ease of access to). The most cited factor is income (Allen et al., 2012), as income necessitates cash flow, which competes between the desire to save and consumption. In Demircug-Kunt et al. (2011), the use of banking services in Mexico was attributed to the inflow of remittances, which improves the extra cash flow of the recipient and the demand for savings accounts. The author's focus was on banking sector breadth, and they used a municipal dataset in arriving at their conclusions. Their main dependent variable was the number of bank branches per capita. Anzoategui et al. (2011) found a similar result for El-Salvador but their findings also noted that remittance does not further inform the use of credit facilities.

Some other factors that can improve access to and use of bank services include regularity of income of potential bank customers, improved employment status, financial literacy and appropriate means of identification (Ladipo, 2012). Technical factors comprise the improvement of households' distance to nearest bank branches, documentation in opening bank accounts and reduced maintenance cost of owning bank accounts in the form of bank charges. To buttress this, Beck et al. (2008) noted that maintaining a bank account in Sierra Leone will require an equivalent payment of 27% of the country's per capita GDP in annual fees, which has been a major deterrent of improving access to and use of bank services.

From a policy perspective, some authors have advocated for social banking policy, which has also been noted for its significance in improving demand for financial services and fostering financial inclusion. This incorporates the banks' ability to increase their spread by focusing on setting branches in communities that are socially disadvantaged and also by supporting social, environmental and ethical agenda. Chakravarty and Pal (2013), who conducted a study using panel data across states in India and suggested geographic penetration of banks as a policy target as well as credit availability as tools for enhancing financial inclusion, further corroborates this stance. Vigneswara (2014) focused on the need to understand the implication of policy actions with regards to financial inclusion across gender. The author asserted that the impact of financial inclusion programmes on poor households was more visible for women headed households. This is attributed to the female awareness level and access to instruments of economic progress. Education of the individuals also matter (Diniz et al., 2012).

Looking closely at the literature reviewed, three main directions can be inferred from the essence of the studies. First is that some focused on firm/bank induced actions that can enhance financial inclusion (Bruhn and Love, 2009; Diniz et al., 2012; Mbutor and Uba, 2013; Chakravarty and Pal, 2013); while the role of remittance and other forms of financial inflow in enhancing financial inclusion was emphasized by a second group (Anzoategui et al., 2011; Demircug-Kunt et al., 2011). The third includes those authors who emphasized on financial inclusion from the individuals' perspective (Allen et al., 2012; Demircug-Kunt and Klapper, 2012; Ladipo, 2012). The latter group relates closely with the perception of this current study. However, some concerns are raised, which establish the need for this current study. Some of the gaps include that the authors (e.g. Allen et al., 2012; Demircug-Kunt and Klapper, 2012) focused on cross country data, which may likely blur specific country dynamics as regards the issue of financial inclusion. Further, Ladipo (2012) and Demircug-Kunt and Klapper (2012) reached their conclusions based on descriptive analysis, which does not show a cause and effect relationship between measures of financial inclusion and individuals' attributes.

3.1. Analytical framework

Fig. 2 presents a framework that conceptualizes the individuals' use of banking services in Nigeria and motivates the empirical discussion of this study. Noting that the distribution of the income of individuals varies between consumption and savings, in the case where an individual decides to save, he/she is faced with the dilemma of either using the bank or refraining from using the bank. However, the decision to choose any of the options is influenced by the push factors. Fig. 2 highlights the demand from the society as a major push factor for urban dwellers to adopt the use of bank services. The first group of urban dwellers will see the urgent need (early adoption) for the use of bank services based on better access to banks, demand from society, public enlightenment, and incentives from the use of bank services. The attributes of the individual is subsumed by societal pressure (demand from society). For instance, in a

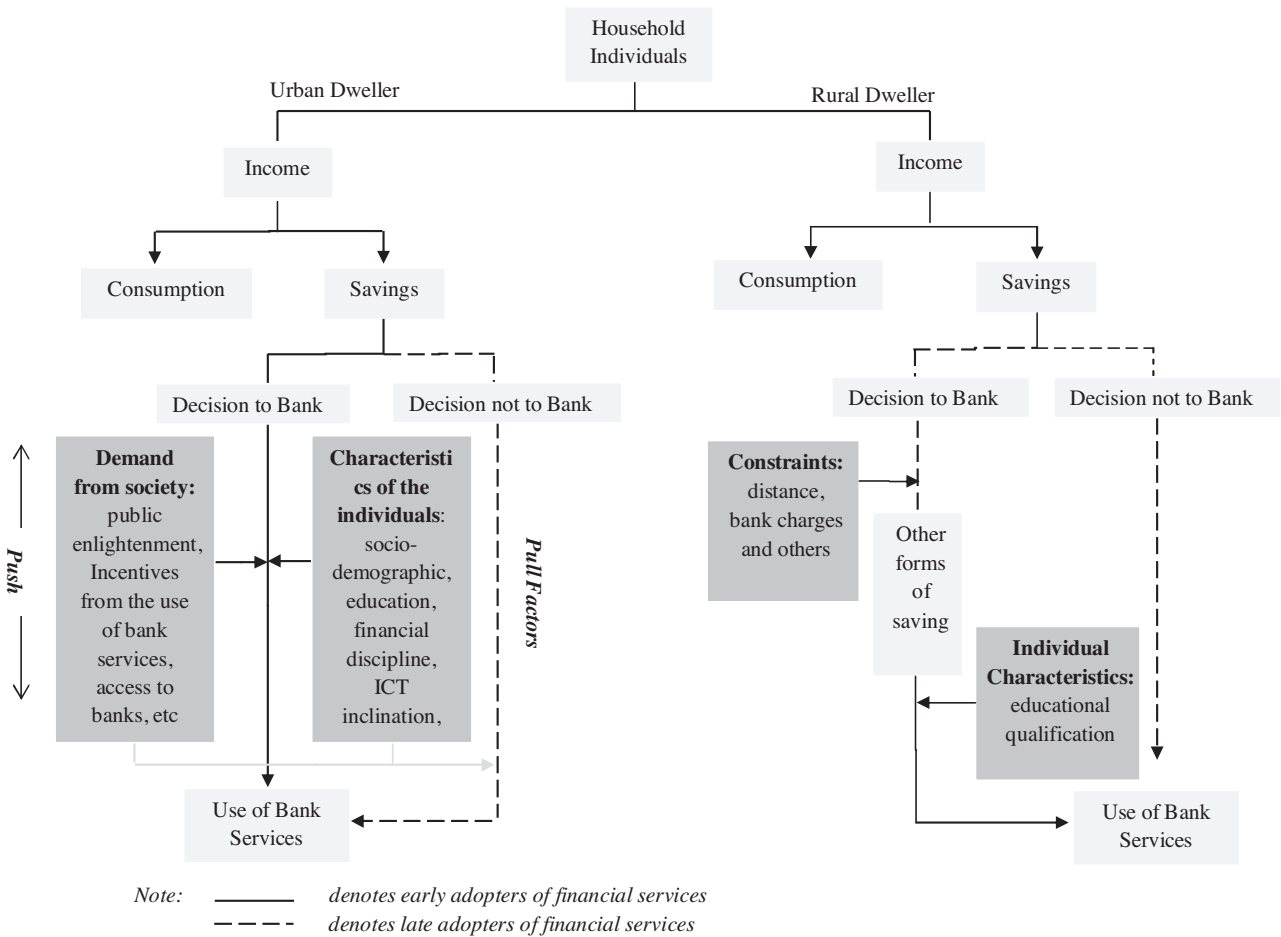


Fig. 2. Individuals’ access to and use of bank services.

Source: Authors’.

typical urban dwelling in Nigeria, the role of the mass media and other avenues for advertisement promotes the usage of the bank for transactions, using vernacular languages to reach all types of potential customers. By this, even the education of the individual does not matter in his/her decisions as he/she has an absolute knowledge of the necessity for the use of bank services.

The second group of urban dwellers represents the late adopters, who later decide to use financial services as a result of information they get from those who have earlier adopted the use of bank services. Furthermore, these individuals are pulled to embrace the use of bank services as the urban society is saturated with pressure iterating the need for these services. This implies that they will be unable to stick to their decision not to bank. Relating this with current happenings in Nigeria, the government drive towards a cashless society and the trend of using debit cards to consummate transactions further amplifies the pressure of the urban society (pull factors).

The rural dwellers as depicted in Fig. 2 are also faced with the two basic outflows from income—consumption and savings. A rural dweller, who decides to save, is faced with the dilemma of deciding to bank or otherwise. The decision not to bank is influenced by the constraints associated with banking services, some of which include distance of the banks to the individual’s place of residence (banks in the rural area are dispersed), and

the transaction cost of using bank accounts (which is higher in rural areas).⁴

In the light of these constraints, the attributes of rural dwellers further reinforces their decision not to open bank accounts and utilize other means of savings as depicted in the figure. We conjecture that the level of education and enlightenment will be lower in rural regions, owing to the fact that public infrastructures in the form of school and other social enlightenment facilities like mass media will likewise be low. Based on this, the individuals living in these regions will not have adequate information about the benefit of opening a bank account. Also, their expectations and confidence in the financial system will be low. This therefore implies that individuals will seek alternative means of saving their funds, which include cooperative societies and association savings among others. This form of savings is popular in the rural parts of Nigeria unlike the urban

⁴ The operational cost of running a bank branch is higher in rural areas due to the volume and type of transactions. For instance, profit from the bank branch is lower in the rural area while the marginal cost of power is higher than the urban (based on the fact that each bank branch generates its power supply). As a result, the bank will charge higher costs for its services in order to offset its operational expenses.

regions where formal banking is prevalent. Similar observation was noted for Kenya and Tanzania (Ellis et al., 2010).

The thick line flowing from ‘other forms of savings’ to ‘use of banking services’ implies that the individual in the rural region will decide to bank depending on the changes in his/her personal attributes. This connotes that if the education and other forms of socio-demographic features such as age improve, the individual will better appreciate the need for the banking services despite the obvious constraints. This will form the early adopters, who will influence the other group of rural dwellers (those who have decided not to bank) to latter adopt the use of bank services. A caveat to these connotations is that the individual’s decision to use bank services is dependent on the improvement of both personal characteristics and societal constraints.

From the conceptual framework, it is sublime to note that community factors in terms of societal constraints and the individual’s attributes matter in determining the use of bank services. Ghana records similar challenges which include increased transaction cost in operating bank accounts, level of educational attainment and financial enlightenment (McConnell, 2010). In Kenya and Tanzania, Ellis et al. (2010) noted that income of the individual, lack of startup fund, cost of service and lack of adequate information about the benefits of financial services, are the top reasons for financial exclusion. Broadly, Demirguc-Kunt and Klapper (2012) noted that in Africa, lack of initial capital to open accounts and other technical constraints matter in utilizing financial services of the banks. These and other studies buttress our framework which largely informs our empirical model.

4. The empirical specification and data

As obtained from the World Bank Household Survey on financial inclusion (2011), three measures were used to capture the extent of access to and use of bank services in Nigeria. They include *use of bank services*, denoted as 1 if the individual owns a bank account and 0 otherwise; *the use of the account to save*, where 1 represents yes if individual has saved in past 12 months and 0 otherwise; and *frequency of withdrawals*, where 1 if the individual has made withdrawals from his/her account 3 or more times in a month and 0 otherwise. These measures have been used in some other studies.⁵

The baseline model comprises of four explanatory variables: individual’s socio-demographic features, income characteristics, level of financial discipline and information and communication technology (ICT) inclination. The variable ‘individual’s attributes’ was included in the model due to consensus (e.g. Vighneswara, 2014) being reached that financial inclusion policies should consider the divergence in receptivity that cuts across gender. We focused on the *sex* of the individuals, where male = 1 and female = 2, and the *age* of the individuals, measured in years since last birthday was considered. The effect of nonlinearity of this variable (*age squared*), which accounts for the effect of older individuals’ decision to open and use a bank account, was added as an attribute. Finally, *educational status*,

measured as 1 if the individual has only elementary education, 2 if secondary education was the highest attainment and 3 if tertiary education was the highest attainment, was also included.

The *individual’s level of financial discipline* is captured using their level of indebtedness. A composite variable was developed, ranked between 0 (better) to 4 (poor), based on the computed sum of the answers (yes = 1, no = 0) to the following questions: borrowed money from a store in the past 12 months, borrowed money from family or friends in the past 12 months, borrowed money from employer in the past 12 months, borrowed money from another private lender in the past 12 months. This variable is logical for capturing financial discipline because the level of indebtedness reveals the extent of frugality of the individual in managing his/her immediate income without seeking other alternatives such as debt. The *income characteristics* include 1 if the individual is in the poorest 20% income quintile, 2 if in the second poorest 20% income quintile, 3 if in the middle 20% income quintile, 4 if in the fourth income quintile and 5 if in the richest income quintile. *Individual’s level of ICT inclination* was measured using the response to the question: do you have a debit card (yes = 1, no = 0). Other measures such as: have you used mobile network to make any financial transaction in the past 12 months (yes = 1, no = 0) would have been used but the data was scanty. Furthermore, we included owning a debit card because the CBN’s major initiative towards the use of ICT for financial inclusion includes the drive towards a cashless economy and debit card is one of the major instruments used.

The econometric model developed for this study is⁶:

$$\begin{aligned} Access_Use_i^k &= \beta_1 + \beta_2 Individual's_Attributes_i \\ &+ \beta_3 Income_i + \beta_4 Financial_Discipline_i \\ &+ \beta_5 ICT_Inclination_i + \varepsilon_i \end{aligned} \quad (1)$$

where superscript $k = 1, 2$ and 3 , implies that three equations will be estimated using the three dependent variables (*use of bank services*, *the use of the account to save* and *the frequency of withdrawals made on the account*). Logistic regression based on the marginal effect was used to estimate the relationships. This estimation technique is a type of probabilistic statistical classification model, which helps in predicting the outcome of a categorical dependent variable. It is preferred because the outcome of the dependent variables used in this study take the binary form, 0 and 1. Furthermore, this technique is a partial derivative of the independent variables and explains the discrete change of an independent variable as the difference in their predicted probabilities. The logistic regression model is displayed as:

$$\begin{aligned} Pr(Access_Use_i^k = 1) &= \beta_1 + \beta_2 Individual's_Attributes_i \\ &+ \beta_3 Income_i + \beta_4 Financial_Discipline_i \\ &+ \beta_5 ICT_Inclination_i + \varepsilon_i \end{aligned} \quad (2)$$

⁵ See Beck et al. (2007) and Demirguc-Kunt and Klapper (2012).

⁶ The empirical model builds on Allen et al. (2012) framework on household behaviour towards financial services.

Table 3
Summary statistics.

Variable	Measures	Response	Percent	Obs.
Use of bank services	Have a bank account	Yes	38.90	389
		No	61.10	611
Use of account to save	Saved in past 12 months	Yes	69.70	697
		No	30.30	303
Frequency of withdrawals	3 or more withdrawals in a month	Yes	68.21	124
		No	31.79	266
Sex	Male	Male	54.60	546
		Female	45.40	454
Educational status	Primary	Completed only primary	24.20	242
		Completed only secondary	73.60	736
		Completed tertiary education	2.20	22
Income characteristics	Income quintile	Poorest 20%	15.90	159
		Second 20%	17.60	176
		Middle 20%	19.30	193
		Fourth 20%	28.40	284
		Richest 20%	18.80	188
ICT inclination	Own a debit card	Yes	25.30	253
		No	74.70	747

Source: Authors'.

The data for this study was sourced from the World Bank Household Survey on financial inclusion (Gallup World Poll–GWP Survey, 2011). The survey contains up to 1000 individual respondents (within the ages 15 and older), randomly selected with countrywide representation. The GWP survey has gained coverage as it has been used by some other studies such as Gasparini and Gluzmann (2009) who studied income, poverty and inequality for Latin America and the Caribbean countries. Also Deaton (2007) earlier studied the linkage between income, ageing, health and well-being around the world using the GWP survey. Recently Demirguc-Kunt and Klapper (2012) and Allen et al. (2012) examined the reasons and factors responsible for ownership and use of formal accounts in Africa and around the world using the GWP data on financial inclusion. This is representative of the reliability of the data.

The summary of the data used is presented in Table 3 and includes individuals comprising of 54.6% male and 45.4% female. Most of the individuals (73.6%) report having secondary school certificate as their highest educational qualification, while very few (2.2%) report that they have completed their tertiary education. Only 24.2% report to have primary education as their highest educational attainment. Considering the income distribution of the individuals, 28.4% agree that they are in the fourth 20% income category. The rest of the individuals are distributed across the other income categories as follows: poorest 20% (15.9%), second poorest 20% (17.6%), middle income 20% (19.3%) and richest 20% (18.8%).

In terms of the usage of the financial system, 61.10% of the sample report that they do not have a bank account. This is worrisome, considering that the respondents are made up of age 15 and above, which validates the assertion that many adults do not patronize financial services. Considering those with bank accounts, about 70% use the account mostly for savings. Furthermore, 68.21% of the sampled individuals accent to the fact that they have withdrawn thrice or more in a month. Only 31.79%

have never withdrawn beyond thrice in a given month. The ICT inclination variable reveals a huge gap between individuals who own a debit card and those without, which represents 74.70% of the entire sample.

Table 4 presents the mean, minimum and maximum values of the age and financial discipline of the individuals. The average age of the individuals was 32 years, with a maximum and minimum age of 93 and 15 respectively. The average score for financial discipline is 1, implying that the extent of the individuals' indebtedness is low.

5. Discussion of results

This section begins by examining the correlation analysis, which was performed in order to underscore the bivariate relationships existing between the variables. We intended to find out if possible multicollinearity exists among the explanatory variables. From Table 6, we observe that age and ICT inclination had a negative bivariate association with use of bank services. Income and age were negatively associated with use of account to save, while sex, financial discipline and ICT inclination were all negatively associated with frequency of withdrawals. We are not able to draw inference from the outcome of the correlation since it was not a multivariate model.

The problem of multicollinearity was not observed between any of the explanatory variables. This shows that our model can be depended on for inference as the interactions between the

Table 4
Summary statistics.

Variable	Mean	Min	Max	Obs.
Age	32.44	15	93	1000
Financial discipline	0.63	0	4	1000

Source: Authors'.

explanatory variables were not able to affect their explanations of the dependent variables.

5.1. Regression results

We present the result for the empirical model in Table 5, which reveals that there exists a significant relationship between the individual's attributes, education, income, ICT inclination and the use of bank services. As revealed from the coefficients in the first two columns in Table 5, the probability of using bank services (owning a bank account) reduces with women, but increases with age, educational attainment, income and ICT inclination. The result is not surprising as the income stream of women is generally slimmer compared with their male counterparts. They are also usually overburdened with household expenditures, which further diminishes their meagre income, explaining the reduction in their chances of opening bank accounts.

Age, educational attainment, income and ICT inclination matter as they inform the desire in the individual to have a bank account. The life experience from age (Age squared), educational attainment, income that forms the basic capital to open the account and ICT inclination, acts as a push factor to open a bank account. Interestingly, when age squared was included in the model (see column 2 in Table 5), the impact of the other explanatory variables behaved differently. For instance, the probability of women and individuals with higher educational attainment owning bank accounts, further reduced from -0.083 to -0.085 , and from 0.456 to 0.432 respectively. Individuals' ICT inclination also reduced from 0.815 to 0.814 . This shows the sensitivity of the other variables to the age of individuals. In other words, when considering older individuals, the impact of sex, educational attainment and ICT inclination on usage of bank services reduces.

Focusing on the explained variable, 'use of account to save' (see column 3 in Table 5), we observed that what matters are the age, educational attainment, income quintile, financial discipline and ICT inclination of the individual. Observing the sizes of the coefficients, ICT inclination and financial discipline matter most. This supports the findings of Diniz et al. (2012) and Vighneswara (2014) that ICT and personal attributes of the individuals matter in enhancing their extent of financial inclusiveness. For clearer emphasis on the result, we further considered the inclusion of the effect of older individuals (*Age squared*) in the model. When this variable was included in the model (see column 4 of Table 5), we observed that there was no significant relationship between this variable 'use of account to save'; implying that older individuals are unlikely to save. The impact of educational attainment and income of the individuals reduced, although it still remained positive.

The impact of financial discipline on the likelihood to save was positive both when age was linear and when its squared value was included in the model (see columns 3 and 4 of Table 5). Based on the measure (0 – better disciplined and 4 – less disciplined), a positive coefficient implies that individuals who are less financially disciplined are more likely to save with a bank. This observation was startling but it is prudent to observe that

in Nigeria, individuals who are more financially disciplined are less likely to open a bank account because the bank has few known benefits to offer an individual for saving with them. This is considering the fact that the savings rate in Nigeria as at 2011 was less than 2%, and the financial opportunity cost of not saving is almost non-existent. Therefore, to promote savings, interest rate on savings account would need to increase. Also, the other benefits accruing to account holders should largely surpass the cost involved such that individuals are drawn to open bank accounts despite their level of financial discipline. From the Table, we also observed that the sex of the individual is not a significant determinant of his/her saving habit. This is based on the fact that the variable 'sex' did not exhibit a significant impact on the regressand.

The impact of the explanatory variables on the frequency of withdrawals was considered and reported in the fourth and fifth columns of Table 5. There was no difference in the behaviour of the explanatory variables when considering age at both its linear and squared value. This implies that in relation to withdrawals from the bank, there is no much difference in the effect of the explanatory variables for both older and younger individuals. The improvement in the educational level, income and financial discipline has a positive impact on the frequency of withdrawals of the individuals. This is expected considering that education and income will 'naturally' incline the individual to use his/her bank account especially to make withdrawals. The higher coefficient of financial discipline signifies that a financially undisciplined individual will require more withdrawals to sustain his/her spending. The result also reveals that ICT inclination will foster withdrawals at the same magnitude for both younger and older individuals. This is because ICT increases the tendency to withdraw funds saved in the bank through means such as ATMs, online and mobile banking services.

The policy implication from the findings is that the access to and use of bank services is sensitive to the age of the individuals. This implies that policy actions should take cognizance of the ages of the individuals for which such policies are targeted. Furthermore, as the CBN drives towards enhancing financial inclusion through the use of ICT facilities in the form of electronic payment and receipt system, it is noteworthy to acknowledge its low level of penetration and acceptance. Moreso, its impact on improving the use of bank services is low considering the magnitude of its coefficient in the Table. This calls for a comprehensive policy where government also considers the level of development (e.g. education, income, and female inclusive development) in relation to driving financial inclusion in Nigeria.

5.2. Robustness

We carried out a robustness to ensure that the results from Table 6 are not influenced by the truncation of our main explained variables. By this, we imply that there is high a possibility that our main explained variables are neglecting some proportion of the population. As earlier observed, the dataset contains about 1000 individual respondents, whose opinions and responses are supposed to be used to infer about the behaviour

Table 5
Correlation analysis.

	Use of bank services	Use of account to save	Frequency of withdrawals	Sex	Age	Education	Income	Financial discipline	ICT inclination
Use of bank services	1.000								
Use of account to save	−0.018	1.000							
Frequency of withdrawals	0.120	−0.043	1.000						
Sex	0.064	0.010	−0.049	1.000					
Age	−0.031	−0.019	0.007	−0.109	1.000				
Education	0.004	0.004	0.109	−0.002	−0.100	1.000			
Income	0.010	−0.053	0.117	0.012	−0.012	0.231	1.000		
Financial discipline	0.044	0.020	−0.282	−0.089	0.148	−0.196	−0.144	1.000	
ICT inclination	−0.037	0.020	−0.161	0.047	−0.049	−0.005	−0.048	0.088	1.000

of a larger population of Nigeria. Furthermore, the explained variables, like use of bank services, use of account to save and frequency of withdrawals, are all having a dichotomous response of Yes or No. However, it is possible that some individuals/respondents have saved or used their bank accounts, at-least once, in the past 13 months, whose responses are likely going to be inadvertently excluded from the dataset. Therefore, the task of econometric modelling is to use this limited information – a truncated distribution – to infer the extent of financial inclusion for the entire population.

We applied the *Tobit* regression estimation technique as further estimation checks. This technique has been adjudged as best for dealing with cases of truncated explanatory variables (Gujarati and Porter, 2009). The result of the *Tobit* model is displayed in Table 7 and it is observed that the coefficients of the explanatory variables in the column ‘use of bank services’ corroborates with the outlook in columns 1 and 2 of Table 6, with regards to its signs and significant levels. This is the case for all the explanatory variables, except for ‘financial discipline’,

which portrays contradictory signs with the values in Table 6. This does not raise concerns since the values were statistically insignificant.

In the second column ‘use of account to save’ of Table 7, the signs and significant levels of the variables were alike with the outlook in Table 6 in most of the rows. However, the variable ‘financial discipline’ was negative and significant in the *Tobit* model (see Table 7). A similar behaviour was seen in the last column ‘frequency of withdrawals’ of Table 7, where the variable-financial discipline was also negative and significant. Our submission at this point is that the variable-financial discipline does not display a consistent sign, depending on the estimation technique applied. For policy action, this variable does not pose serious concerns, since policy makers do not have control over this variable, as it is an innate attribute of individuals. However, education, income, and ICT inclination, are variables that government policies can readily affect. These variables were consistent in both estimation techniques.

Table 6
Marginal effect from logistic regression.

Dependent variables Variables	Use of bank services		Use of account to save		Frequency of withdrawals	
	dy/dx	dy/dx	dy/dx	dy/dx	dy/dx	dy/dx
Sex	−0.083** (0.015)	−0.085** (0.011)	−0.023 (0.427)	−0.027 (0.351)	0.012 (0.312)	0.012 (0.311)
Age	0.010* (0.000)		0.004* (0.002)		0.001 (0.732)	
Age squared		0.001* (0.000)		0.001 (0.129)		−0.001 (0.714)
Education	0.456* (0.000)	0.432* (0.000)	0.113* (0.002)	0.093* (0.009)	0.029 (0.377)	0.029 (0.380)
Income	0.100* (0.000)	0.103* (0.000)	0.040* (0.001)	.024** (0.039)	0.039*** (0.065)	0.039** (0.061)
Financial discipline	0.388 (0.198)	0.041 (0.167)	0.065* (0.001)	0.071* (0.001)	0.086* (0.002)	0.086* (0.001)
ICT inclination	0.815* (0.000)	0.814* (0.000)	0.218* (0.000)	0.222* (0.000)	0.264* (0.000)	0.266* (0.000)
Pseudo R ²	0.193	0.181	0.036	0.030	0.025	0.025
Prob.	0.000	0.000	0.000	0.000	0.000	0.001
Log likelihood	−541.990	−549.783	−591.388	−595.099	−384.344	−384.335
Predicted prob.	0.351	0.351	0.706	0.704	0.059	0.059
Observation	1000	1000	1000	1000	1000	1000

Note: the superscripts *, **, *** implies 1%, 5% and 10% levels of significance.

Table 7
Tobit regression estimates.

Variables	Use of bank service		Use of account to save		Frequency of withdrawals	
Sex	−0.096* (0.003)	−0.099* (0.002)	−0.048 (0.601)	−0.060 (0.510)	−0.092 (0.230)	−0.091 (0.231)
Age	0.008* (0.000)		0.009** (0.020)		0.002 (0.509)	
Age squared		0.001* (0.000)		0.001 (0.269)		0.002 (0.420)
Education	0.206* (0.000)	0.192* (0.000)	0.178 (0.116)	0.124* (0.267)	0.098 (0.331)	0.100 (0.322)
Income	0.056* (0.000)	0.057* (0.000)	0.076** (0.044)	0.078** (0.042)	.0392 (0.227)	0.040 (0.222)
Financial discipline ICT inclination	−0.086 (0.416)	−0.104 (0.328)	−0.807* (0.003)	−0.837* (0.002)	−0.414* (0.010)	−0.416* (0.009)
	1.796* (0.000)	1.808* (0.000)	0.826* (0.000)	0.847* (0.000)	0.403* (0.000)	0.405* (0.000)
Constant	−0.235 (0.308)	−0.030 (0.892)	2.067 (0.001)	2.451 (0.000)	2.551 (0.000)	2.579 (0.000)
Sigma	0.443*	0.446*	1.158*	1.163	0.714*	0.714
F-stat.	34.880	34.280	14.140	13.250	9.150	9.150
Prob.	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Observation	1000	1000	1000	1000	1000	1000

Note: the superscripts *, **, *** implies 1%, 5% and 10% levels of significance.

6. Conclusion

This study examined the extent of access to and use of bank services by individuals in Nigeria. This was measured by three dependent variables: use of bank services, use of account to save, and frequency of withdrawals made on the account, while the independent variables were: individual's attributes, income characteristics, financial discipline and ICT inclination. This is imperative as it takes a bottom-top approach to examine financial inclusion, which will enable policy makers, both within Nigeria and in other African countries, to better understand the factors that push and pull individuals towards owning and using a bank account. The Gallup World Poll Survey on financial inclusion from individuals around the world was used for the empirical analysis, and the results revealed that the individual's attributes, income and ICT inclination are significant in explaining the use of bank services in Nigeria.

As with empirical studies, we bring to bear some limitations of this study: first is that the Gallup World Poll Survey for Nigeria did not separate the individuals based on their dwellings (urban or rural dwellers). This therefore makes it difficult to empirically capture the influence of location of the individual on the decision to bank. This would have been interesting considering the conceptual model in this paper, where we noted a different decision flow chart for the two categories of dwellers. Secondly, the data did not include societal factors such as distance between the residence of the individual and the bank branch. We intended to use these kinds of variables for robustness.

The data from the World Bank also seems to be downward biased, i.e. majority of the respondents (73.6%) who participated in the survey had only secondary education as their highest form of education, and only 2.2% had completed any form of tertiary education. A dataset containing mixed respondents that are

evenly distributed across strata of educational attainment would be necessary to further validate the findings of this study. These limitations notwithstanding, we believe that the findings from this study help to shed more insight on the access to and use of bank services in Nigeria using micro estimations. We employ future research to distinctly move beyond our limitations.

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