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Predictors of Islamic Financial Inclusion in the Northwest Nigeria: A Preliminary Cross-Sectional Investigation

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Abstract

Financial inclusion is seen widely as a tool for attaining macroeconomic objectives of economic growth, poverty reduction, economic prosperity, and the like. The phenomenon of Islamic financial inclusion is a decade old in Nigeria. As a prelude (pilot) to a broader study, this paper conducts a preliminary assessment of predictors of Islamic financial inclusion in the Northwest zone which is composed of seven (7) states in Nigeria. Leveraging on expositions in both the theoretical and empirical literature on dimensions of financial inclusion; access, use, quality, and barriers, this study constructs three logistic regression models based on access to financing facilities, access through automated teller machine (ATM), and access using unstructured supplementary service data (USSD) banking code. Results show that while the access to financing logistic model outperforms the other two models, the household's location and years of business (YOB) experience were statistically significant across all three models implying that those in the urban areas and with more years of business experience tend to be more financially included than their counterparts in the rural areas. In line with intuition, the age of the household and YOB experience are averse to the use of ATM card and USSD code for banking transactions. The paper recommends improved infrastructure provision and increased reach to rural areas through innovative banking service delivery to enhance financial inclusion in the zone. This study is among earliest attempts that assess the predictors of Islamic financial inclusion in the Northwest, Nigeria.

Keywords: Financial Inclusion; Exclusion; Household; Logistic Regression; Northwest Zone
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I. Introduction

Financial inclusion as a concept and financial policy instrument permeates the global agenda and resonates as a veritable policy instrument for inclusive economic growth, especially in developing economies. The concept of financial inclusion is an essential factor for poverty reduction and, in turn, an enabler of economic prosperity and its antonym, financial exclusion ranks as one of the main risk factors for poverty worldwide, a brake on economic growth, savings, and credit (Amidzic et al., 2014; World Bank, 2017; Brekke, 2018; Alonso et al., 2022). Globally, financial inclusion rhythms with the Sustainable Development Goals (SDGs) of the United Nations, which places access to finance as an enabler for development (Sethy, 2016; Zamer, 2018; Ali et al., 2020). Financial inclusion refers to the proportion of individuals and firms that use or access a wide range of financial products/ services through formal and/or informal institutions (World Bank, 2014; Central Bank of the Philippines, 2019 & 2018; EFInA, 2021).

Domesticating the term, the National Financial Inclusion Strategy (NFIS) (2018) posited that financial inclusion is achieved when adult Nigerians have easy access to a broad range of formal financial services (payments, savings, credit, insurance, pension, and capital market products) that meet their needs at affordable costs. The IFC Bulletin (2018) recognized that financial inclusion is viewed differently across jurisdictions. Thus, financial inclusion connotes the integration of individuals and small enterprises who previously were not within the financial system and do not have access to basic, affordable, and appropriate formal financial services that meet their needs.

Among other recognized virtues, a high level of financial inclusion also contributes to greater stability in the banking sector (Ahamed & Mallick, 2019) and ensures a more equitable economy (Ahmed & Salleh, 2016) and inclusive growth and poverty reduction (Oyelami et al., 2017; and Hussaini & Chibuzo, 2018). At the micro level, it promotes the growth of the MSMEs and businesses (Okello et al. 2017; Yussuf, 2017; Riwayati, 2017; IMF, 2019; Sanistasya et al. 2019), and economic growth at the macro level (Babajide, Adegboye & Omankhanlen, 2015; Sharma, 2016; Kim et al., 2017; Mustafa et al. 2018; Banna & Alam, 2020; Ismail et al., 2021; Trianto et al., 2021).

Financial exclusion stipples income generation and wealth accumulation among excluded individuals and propagates poverty and income inequalities (Adewale, 2014; Park & Mercado Jr, 2015; and Omojolaibi, 2017). Greater financial inclusion promotes access to basic income, food, health, and education in households (Masiyandima et al., 2017). However, evidence alludes to a significant negative relationship between debt behavior, household consumption, and financial inclusion (Alter et al., 2018; Herispon, 2019; Sikarwar et al., 2020). Moving towards a cashless economy through the infusion of technology into the banking system spurs more access to credit but the wrong use of it exacerbates indebtedness (Sikarwar et al., 2020).

Islamic finance is driven by the Shari'ah principles (Q2:275-278, 3:130-132, 4:161 and 30:39). It is an unbiased system, with no inbuilt discrimination, and its products are available to all regardless of one's own belief. The core principles of Islam lay great emphasis on social justice, inclusion, and sharing of resources between the haves and the have-nots (Mohieldin et al., 2011).

Specifically, Islam explores all possible means that promote a balanced distribution of wealth. The Holy Qur'an states:

> *"Whatever God restored to His Messenger from the inhabitants of the villages belongs to God, and to the Messenger, and to the relatives, and to the orphans, and to the poor, and to the wayfarer; so that it may not circulate solely between the wealthy among you" (Qur'an, 59:7).*

Practically, Islam promotes financial inclusion more explicitly through two distinct features of Islamic finance; the notions of risk-sharing and wealth redistribution (Abdullahi et al., 2020). The resilience of Islamic finance as an alternative means of financial intermediation has been documented in the literature and its catalytic role in financial inclusion as well (Demirgüç-Kunt et al., 2008; Levine, 2005; World Bank, 2000; 2014; Sethy, 2016). Evidence documents a strong link between Islamic financial inclusion, inclusive growth, and poverty reduction (Oyelami et al., 2017). Islamic finance might not only enhance financial inclusion but trigger financial migration from conventional banks to Islamic banks as well (Jouti, 2018).

Globally, more than 50% of the world's adult population (over 2.5 billion) do not possess any formal account with a financial institution; of these, 5 percent cite religious reasons for not having an account (World Bank, 2014; Yahaya et al., 2020). Muslims worldwide are less included in the formal financial system than their non-Muslim counterparts (Demirguc-Kunt et al., 2013; Shaikh et al., 2017). According to a study of 29,000 people in 29 countries, for instance, Muslims are less likely to have bank accounts than non-Muslims, partly for religious reasons and partly because of discrimination (Brown, 2011; Brekke, 2018).

In Nigeria, financial exclusion is as high as 36.6 percent when compared with some sub-Saharan African countries (Abdullahi et al., (2020). This leaves 36 percent of Nigerian adults, equivalent to 38 million adults, completely financially excluded and unenviably, ranks the country higher, in terms of financial exclusion, more than any other country in Sub-Saharan Africa (EFInA, 2021). Data on regional disparity shows that the Northern part of Nigeria is behind its Southern counterpart in the use of formal financial services with 10 out of the most financially excluded states hailing from the North-West and North-East (EFInA, 2015). In 2016, the level of regional disparity persisted with up to 70 percent of the people in the Northwest excluded from the use of financial services (Central Bank of Nigeria, 2018). Broadly, evidence shows that Nigeria is 14 percent away from attaining the 80 percent financial inclusion target for the year 2020.

Meanwhile, the emergence of Islamic finance in Nigeria is seen as a veritable tool of mitigating financial exclusion in the country. The phenomenon started with the first registered full-fledged bank–Jaiz Bank Plc in 2012 (Aliyu, 2013). Likewise, the Central Bank of Nigeria (CBN) launched the National Financial Inclusion Strategy (NFIS) in 2012 which was later revised in 2018. Among others, the strategy articulated the demand-side, supply-side, and regulatory barriers to financial inclusion. Markedly, Islamic interest finance in Nigeria has witnessed phenomenal growth with over 30 service providers ranging from full-fledged banks, non-interest banking window, microfinance banks, Takaful operators, and Sharia's compliant fund managers.

Although from conventional perspective, the efforts have spurred empirical studies on financial inclusion such as Adewale (2014) using demand side predictors of financial exclusion and livelihood assets acquisition among Muslims in Ilorin, Nigeria; Okoye et al. (2017) on effect of financial inclusion on economic growth and development in Nigeria; Ibrahim et al. (2017) on financial inclusion, financial development, and economic diversification in Nigeria; Omojolaibi (2017) on financial inclusion, governance, economic progress and welfare effect on the poor in Nigeria. Others include Ozdeser and Cavusoglu (2019) on the finance-welfare nexus using a multi-variable financial inclusion index; Adegbite and Machethe (2020) on bridging the financial inclusion gender gap in smallholder agriculture in Nigeria; Ozili (2022) on an overview of the level of financial inclusion in Nigeria; and more.

Furthermore, only glimpses of related studies in Nigeria exist – Shinkafi (2019) uses a library-based research approach, Abdullahi, Othman and Kassim (2020) employ a theoretical and empirical review of measures of enhancing financial inclusion in Nigeria could be traced in the literature. Accordingly, given the dearth of empirical studies and the dismal performance of the Northwest region on financial inclusion indicators since the emergence of Islamic finance in the country, this paper assesses the predictors of Islamic financial inclusion based on pilot study data collected across the seven States in the region. The paper postulates that the introduction of Islamic finance in Nigeria will mitigate the extent of financial exclusion in the zone. The paper is organized into five sections. Section one dwells on the introduction while section two reviews related theoretical and empirical literature. Section three presents the research methodology, sample description and data sources, and specification of the empirical models. Sections four and five contain the presentation of empirical results, and a conclusion and recommendations, respectively.

II. Literature Review

Financial Inclusion, Conceptual Issues and Measurement

Financial inclusion is defined differently in the literature yet with no consensus. It is generally understood as the process of ensuring that people have easy access to and use financial services from formal financial institutions in a timely, adequate, and affordable manner, especially for the financially disadvantaged group (Sarma, 2008; De Koker & Jentzsch, 2013; Joshi et al., 2014). It is when a financial system maximizes usage and access while minimizing involuntary financial exclusion (Cámara & Tuesta, 2014). In particular, the World Bank (2018) sees financial inclusion as a means through which individuals and businesses have access to affordable financial products and services that meet their needs and are implemented in a way that is responsible and sustainable. At best, some evidence posits that a country's level of socio-economic development matters on how financial inclusion is perceived (Aduda & Kalunda, 2012; Akileng et al., 2018; Nguyen, 2020).

An inclusive financial system promotes sustainable development and increases shared prosperity (World Bank, 2014). It is an essential factor in redistribution policy and poverty reduction through its positive effect on economic growth and prosperity (Iqbal & Mirakhor, 2013; Amidzic et al.,

2014; Park & Mercado, 2015; Masiyandima et al., 2017; Shaikh et al., 2017; Ibrahim et al., 2019; and Widarwati et al., 2019). Hence, it has been receiving a lot of attention globally with more than half of agencies and regulatory bodies that are tasked to work on financial inclusion. On the contrary, financial exclusion stipples income generation and wealth accumulation among excluded individuals and propagates poverty and income inequalities (Adewale, 2014; Park & Mercado, 2015; Omojolaibi, 2017).

In practical terms, the concept of financial inclusion goes beyond single indicators, such as the percentage of bank accounts and loans and several automated teller machines (ATMs) and branches (Sarma, 2008; Camara & Tuesta, 2014). There are at least three dimensions to measure financial inclusion; access, use, and barriers[4] (Trianto et al., 2021). The Access dimension relates to how much financial services are available in a region in terms of bank outlets, or facilities such as ATMs. Usage dimension pertains to ownership of savings and financing accounts. In terms of barrier dimension, these include distance, administrative requirements, and costs[5] (Camara & Tuesta, 2014). Further evidence in the literature adds one more dimension, namely quality (OJK, 2017). In the context of this paper, Islamic financial inclusion implies a person's ability to access Islamic financial institutions such as Islamic banking, Islamic rural banks, or Islamic Microfinance Institutions.

The underlying theoretical foundation of analyses in this paper is the Threshold Decision-Making Theory proposed by Hill and Kau (1973), Pindyck and Rubinfeld (1998), and Greene (2003). The theory as it applies to this paper notes that when individuals are faced with a decision to seek to be financially included or not in the non-interest financial institution, there is a reaction threshold inherent in them which is dependent on a set of factors. At a given level of stimulus below the threshold, the individuals will not seek to be included while at the critical threshold level, the desire to be included in the non-interest financial institution is stimulated (Mhlanga et al, 2021).

Previous Research

Islamic finance promotes an inclusive financial system especially due to instances of voluntary financial exclusion based on religious and ethical reasons (Othman & Kassim (2021). Evidence suggests that non-interest financial institutions promote financial inclusion and exert positive income effects (Abduh & Omar,2012; Leon & Weill, 2017; Razak et al., 2019; Kabiru & Ibrahim, 2020; Mensi et al., 2020).

[4] These are somewhat like the index financial inclusion developed by Sarma (2008) using three basic dimensions of an inclusive financial system: banking penetration (BP), availability of the banking services (BS), and usage of the banking system (BU). "Affordability" and "Timeliness" are other important aspects of an inclusive financial system (Rangarajan Committee, 2008). Also, See Sharma (2010 &2012). Like Sarma (200), Amidzic, Massara, and Mialou (2014) use a multidimensional approach like the popular composite indices of well-being constructed by the United Nations Development Program (UNDP) such as the Human Development Index (HDI), Human Poverty Index (HPI) to construct a five-step sequence to compute the financial inclusion index. Nonetheless, the composite indices by Sarma (2008 & 2012), Chakravarty and Pal 2010) and Amidzic et al. 2014), apply largely to secondary data.

[5] Park and Mercado (2018) aggregate nine indicators of access, availability, and usage to compute the financial inclusion index in 151 economies using principal component analysis.

An empirical study by Shaikh et al., (2017) found that the low level of financial inclusion in the Organization of Islamic Cooperation (OIC) member countries was largely due to the Muslims' voluntary exclusion of interest-based financial services. They reported that on average, only 28 percent of adults in the OIC member countries hold a bank account with a formal financial institution while only 7.7 percent of the poorest 40 percent borrow from these financial institutions. In Guinea-Bissau, Gabon, Chad, Sudan, Syria, Mozambique, Gambia, and Iraq, for instance, microfinance outreach caters to less than 1 percent of the poor people. Authors conclude that although these facts pose a serious challenge, together, they point to huge potential for Islamic banks to increase their outreach toward fostering inclusive finance in the OIC countries.

Using probit and logit models, Abdu et al., (2018) estimated the level of financial inclusion in sub-Saharan Africa (SSA) using the World Bank's Global Financial Inclusion Index Dataset, 2015. The study found that the introduction of the Islamic banking and finance system in some OIC member countries in the SSA boosted financial inclusion in the sub-region. Further, it was found that households in the OIC countries with Islamic banking and finance are more likely to be financially included than their counterparts in OIC countries without Islamic banking and finance. Key drivers of financial inclusion in the sub-region were age, gender, income level, and level of education, the study concludes.

On his part, Brekke (2018) assessed the level of financial exclusion and inclusion in Norway through three interrelated questions; to what extent do Muslims see conventional banking as a problem in their own lives; does level of religiosity predict demand for Islamic banking and is demand for Islamic banking changing? The study found that Muslims feel it is a problem that they must use conventional banks if they want to take mortgage financing and that there is a correlation between the strength of religiosity and interest in Islamic banking. Awareness of Islamic banking too, has grown over the past decade leading to demand for new financial products.

Using a panel study approach, Akhter et al., (2019) assessed the determinants of financial inclusion, both demand and supply side factors in 14 middle and 14 lower-income countries in Asia and Africa between 2005 and 2014. Panel regression results indicate that Islamic banking has significantly contributed to the demand side determinants of financial inclusion (borrowers' side or the users of banks financing), especially in Africa but had a significant negative effect in Asia. The study posited that to reverse the negative effect in Asia, Islamic banks should strive to ease access to banking services and increase branch networks in the region.

Factors that influence the level of Islamic financial inclusion in Indonesia were investigated by Ali et al., (2020) using an analytic network process (ANP) model which was used to gather expert opinions and responses from academics, regulators, and industry practitioners. Findings show that the level of Islamic financial inclusion in Indonesia is influenced by both supply and demand driven factors. The demand factors, in order of significance, are financial literacy (0.27), religious commitment (0.22), socioeconomic factor (0.19), and social influence (0.17), respectively. The supply side predictors are human capital (0.32), product and services (0.24), infrastructure (0.18),

and policies and regulation (0.17), respectively. The authors, however, admit that their sample did not include the Islamic insurance sector.

Furthermore, Khmous and Besim (2020) investigated how the Islamic banking share (percentage of total Islamic banking assets relative to total banking sector assets) and individual characteristics (gender, age, income, and education) affect financial inclusion in 14 Middle Eastern and North African (MENA) countries across different income categories. The 2014 World Bank Global Findex database was fitted into a probit model. Empirical findings showed that financial inclusion, especially in middle-income MENA countries, is lower than the global average. It was also found that being male, rich, and older positively affects financial inclusion while education does not. Importantly, Islamic banking practices contribute to financial inclusion, especially for individuals with strong religious affiliations and more generally in middle-income MENA countries. Thus, countries in the region are advised to promote Islamic banking and incentivize investments in technology, which helps expand financial inclusion.

The investigation by Abdullahi et al., (2021) assessed Islamic financial inclusion determinants using financial literacy, trust, financial self-efficacy, and social influence as predictors. A cross-section of 215 respondents from West Java, Lampung, South Kalimantan, Gorontalo, and West Nusa Tenggara in Indonesia were surveyed. The study employed exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) methods and structural equation modeling (SEM). Findings show that social influence is a strong predictor of Islamic financial inclusion in the regions. Policymakers and the Islamic financial industry were encouraged to embark on campaigns that involve local culture and public or religious figures as gateways to improvement in social influence and financial inclusion.

Similarly, a study by Trianto et al., (2021) sought to assess the relationship between Islamic financial literacy, Islamic financial inclusion, and business growth in a culinary cluster of creative economy in Pekan baru, Indonesia. The study employs nonprobability sampling which covers 62 business owners in the culinary cluster. Results showed that Islamic financial literacy impacts positively on Islamic financial inclusion and business growth. Further, the study found a positive and significant relationship between Islamic financial inclusion and business growth. Instrumentally, financial literacy and Islamic financial inclusion are key to the development of business enterprises. The study recommends that business actors in the culinary cluster must continue to improve Islamic financial literacy and Islamic financial inclusion to achieve sustainable growth of their businesses.

The foregoing literature review reveals an array of predictor variables applied in assessing different dimensions of financial inclusion. Evidently, most of the studies were carried out in the Asia and Middle eastern countries and a few others in African and Nigeria, in particular. Nonetheless, literature documented the library-based study by Shinkafi et al., (2019). On their part, Kabiru and Ibrahim (2020), included Nigeria among the OIC countries in their study while Adewale (2014), used conventional indicators of financial exclusion, and assessed their impact on livelihood assets acquisition among Muslim households in Ilorin, Kwara State, Nigeria. Thus, none of the studies reviewed assessed predictors of non-interest financial inclusion in Nigeria and this presents a gap that prompts this investigation.

III. Methodology

Data

The data for this paper stem from a pilot questionnaire administered to a sample of eighty (80) respondents across the seven States in the Northwest zone: Jigawa, Kaduna, Kano, Katsina, Kebbi, Sokoto, and Zamfara States, in the Northwest zone, Nigeria. The Northwest zone has been characterized by a high incidence of financial exclusion relative to other zones in Nigeria (EFInA, 2015; Central Bank of Nigeria, 2018). Further, with a predominantly Muslim population, the introduction of Islamic banking in the country in 2012 is envisaged to assuage the voluntary financial exclusion in the region. Thus, research respondents constitute households that operate an account with non-interest service providers–full-fledged banks, non-interest microfinance banks, Takaful operators, and Halal fund managers, in the Northwest zone. Using a stratified random sampling technique, the size is not only adequate for testing the validity of the research instrument but also provides early results on predictors of Islamic financial inclusion in the region.

The Logit Model

Leveraging the applications of standard and logistic regression models by numerous researchers in the literature, this paper employs a logit model to analyze the effect of financial inclusion on households in the study area. Logit analysis regression is, in many ways, the natural complement of ordinary linear regression whenever the regress and is not a continuous variable but a state, which may or may not hold, or a category in each classification (Cramer, 2006). Thus, the use of the logit model in this paper over the probit model is because of its mathematical convenience and simplicity (Rao, 1973; Maddala, Li & Srivastava, 2001; Greene, 2008). Thus, using a logistic regression, we predict the probability of an event, given a set of predictor variables. Following Gujarati (2009), the theoretical logit model can be expressed as:

$$Y_i = \beta X_i + u_i \qquad (1)$$

Where Y_i, in this case, is equal to one (1) when an individual chooses to be financially included in the non-interest financial institution and zero (0) otherwise. Meaning:

$$\begin{matrix} 1, if the household has an account with non interest bank \\ 0, if the household has no account with non interest bank \end{matrix}$$

From equation 1, Y_i= 1 if X_i is greater than or equal to a critical value,X^* and Y_i= 0 if X_i is less than a critical value, X^*. Note thatX^* represents the combined effects of the independent variables (X_i) at the threshold level. Further, the equation represents a binary choice model involving the estimation of the probability of households being included in the non-interest financial institution in the Northwest zone, Nigeria (Y_i) given a set of factors (X_i) such as age, gender, marital status, religion, level of education, among others, that are exogenous and associated with thei^{th} household.

Mathematically, this is represented as:

$$Prob(Y_i = 1) = F(\beta' X_i) \quad (2)$$

$$Prob(Y_i = 0) = 1 - F(\beta' X_i) \quad (3)$$

Function F may take the form of a normal, logistic or probability function. The logit model uses a logistic cumulative distributive function to estimate, P as follows (Pindyck & Rubinfeld, 1998):

$$Prob(Y_i = 1) = \frac{e^{\beta' X}}{1 + e^{\beta' X}} \quad (4)$$

$$Prob(Y_i = 0) = 1 - \frac{e^{\beta' X}}{1 + e^{\beta' X}} \quad (5)$$

Taking the natural log of equation (4) and (5) yields:

$$L_i = \ln\left(\frac{P_i}{1 - P_i}\right) = Z = \beta_1 + \beta_2 X_i + u_i \quad (6)$$

Where: L means the log of odds ratio, equation (8) represents what is known as the logit model which is used when the dependent variable takes a binary value; 0 or 1.

Specification of the Empirical Model

The paper assesses the predictors of Islamic financial inclusion in the Northwest zone, a region characterized by a high incidence of financial exclusion in Nigeria. Thus, the paper hypothesizes that while the introduction of Islamic finance in Nigeria will mitigate the extent of financial exclusion in the zone, some factors are assumed to be crucial in determining the extent of financial inclusion in the study location. We use three measures of access to financial services from the Islamic bank: access to financing (financial facility), access using an ATM card, and access using the USSD banking code.

Therefore, drawing from equation (6) and in line with similar applications by (Idrisa et al., 2010; Dufhues et al., 2013; Abel et al., 2018, Poonam, 2019; Shah, 2020; Abel, 2020; Mhlanga et al. 2021; Danlami et al., 2024), we construct three models of financial inclusion as follows:

$$Ln\left(\frac{F.acc_i}{1 - F.acc_i}\right) = \beta_o + \beta_1 gender_i + \beta_2 age_i + \beta_3 m.status_i + \beta_4 education_i + \beta_5 income_i + \beta_6 h.location_i + u_t (7a)$$

Where: $Ln\left(\frac{F.acc_i}{1-F.acc_i}\right)$ stands for the log of odds of a household having access to financial services and otherwise. $\beta_o, \beta_1, \beta_2, \ldots \beta_6$ are the constant and coefficients of gender, age, marital status, level of education (disaggregated into secondary, undergraduate, and postgraduate), income, and location of household, respectively, while u_t is the error term.

$$Ln\left(\frac{F.acc_i}{1 - F.acc_i}\right) = \beta_o + \beta_1 h\_acc\_NIFI_i + \beta_2 NIFI\_near\_home_i + \beta_3 NIFI\_near\_office_i + \beta_4 NIFI\_market_i + \beta_5 time\_NIFI_i + \beta_6 duration\_NIFI_i + \beta_7 YOB.experience_i + u_t \quad (7b)$$

Where: $Ln\left(\frac{F.acc_i}{1-F.acc_i}\right)$ stands for the log of odds of a household having access to financial services and otherwise. $\beta_o, \beta_1, \beta_2, \ldots \beta_7$are the constant and coefficients of predictor variables; having an account with the non-interest bank (NIFI), nearness of NIFI to home, nearness to office/working place, nearness to market, duration of household with NIFI and households' years of business (YOB)experience, respectively, while u_t is the error term.

$$Ln\left(\frac{F.ATM_i}{1-F.ATM_i}\right) = \beta_o + \beta_1 gender_i + \beta_2 m.status_i + \beta_3 h.size_i + \beta_4 h.size_i^2 + \beta_5 h.loc_i + \beta_7 YOB.experience_i + \beta_7 YOB.experience_i^2 + u_t (8a)$$

$$Ln\left(\frac{F.ATM_i}{1-F.ATM_i}\right) = \beta_o + \beta_1 NIFI\_near\_home_i + \beta_2 NIFI\_near\_offe_i + \beta_3 NIFI\_market_i + \beta_4 time\_NIFI_i + \beta_5 education_i + \beta_6 income_i + \beta_7 duration\_NIFI_1 + \beta_8 duration\_NIFI_1^2 + u_t \quad (8b)$$

Where:$Ln\left(\frac{F.ATM_i}{1-F.ATM_i}\right)$in equations 8a and 8b stands for the log of odds of a household having access to financial services through the use of an ATM card and otherwise, while $\beta_o, \beta_1, \beta_2, \ldots \beta_7$are the constant and coefficients of gender, marital status, household size, household location, YOB experience and the squared YOB experience, respectively, while u_t is the white noise error term. Similarly, in equation 8b, the predictors are as defined in equation 7b above.

$$Ln\left(\frac{F.USSD_i}{1-F.USSD_i}\right) = \beta_o + \beta_1 gender_i + \beta_2 age_i + \beta_3 income_i + \beta_4 income_i^2 + \beta_5 h.loc_i + \beta_6 h.size_i + u_t (9a)$$

$$Ln\left(\frac{F.USSD_i}{1-F.USSD_i}\right) = \beta_o + \beta_1 h.size_i + \beta_2 income_i^2 + \beta_3 duration\_NIFI_i + \beta_4 duration\_NIFI_i^2 + \beta_5 time\_NIFI_i + \beta_6 YOB.experience_i^2 + u_t \quad (9b)$$

Where: $Ln\left(\frac{F.USSD_i}{1-F.USSD_i}\right)$ in equations 9a and 9b stands for the log of odds of a household's access to financial services through the use of USSD code and otherwise, while $\beta_o, \beta_1, \beta_2 \ldots \beta_6$ are the constant and coefficients of predictor variables as defined in the equations above as well as on the Table 1. The maximum likelihood method was used to estimate the parameters. The estimation procedure resolves the problem of heteroscedasticity associated with other estimation procedures such as the Linear Probability Model (LPM). It constrains the conditional probability of inclusion of individual adults in the formal financial market to lie between zero (0) and one (1).

Reliability Analysis

Reliability analysis was conducted to determine the reliability and internal consistency of the variables used in the pilot study using Cronbach's alpha coefficient. Cronbach's alpha describes the extent to which variables measure a concept. It is connected to the inter-relationship of the

variables in the test. According to Santos (1999), Cronbach's alpha assesses the average correlations of variables in a survey to gauge their reliability. The value of Cronbach's alpha ranges between 0 and 1 and the closer the value is to 1, the better the result. Gliem and Gliem (2003) stated that any value of Cronbach's alpha below 0.5 is unacceptable. Although Santos (1999) posited that any value of Cronbach's alpha from 0.7 is acceptable for good internal consistency a value of more than 0.6 also suffices (Kline, 2005; Bagozzi & Yi, 2012; Hair et al., 2012; Danlami et al., 2017). The description of variables can be seen in Table 1.

Table 1. Description of Variables

Variable	Description	Justification
Gender	Is a dummy variable where 1 = male and 0 otherwise. This is expected to be +	
Education	Is a categorical variable used to group households based on [0 = illiterate, 1 = Primary, 2 = Secondary. 3 = NCE/OND. 4 = HND/Degree, and 5 = Postgraduate].	Education can increase awareness and is expected to increase financial inclusion, or higher education attracts higher income and less financing needs.
Religion	A categorial variable.	
Age	Household age (in years). In its squared form, it stands as a proxy for old age.	The age of a household affects financial inclusion and the older the household, the less likely he/she will be financially included.
Marital status	Explain whether the individual is married or not, where 1 = legally married and 0 otherwise. This is expected to be positive (+).	Marriage raises the level of financial needs of households and hence could deepen financial inclusion and vice-versa.
Income	Is the total amount of income received by the individual. The variable is expected to have a positive (+) influence on financial inclusion.	Higher income level is often associated with a greater need for banking services and hence greater financial inclusion.
Household size	Number of members in a household. This is expected to be positive (+)	All things being equal, the larger the size of a household, the higher the need for financing. In its squared form, it is used to capture …
Household Location	A proxy for distance is measured based on the length of time taken to reach a non-interest financial institution (NIFI). [Urban = 1 and Rural = 0]	The longer time it takes to reach NIFI, the less the incidence of financial inclusion
Duration with NIFI		
Years of Business experience		

IV. Results and Discussions

Results presented in Table 2 depict the value of Cronbach's alpha for all the variables; predictor and predicted. While the lowest value of the statistic is 0.562, the highest value is 0.658. The average value stood at 0.623, which is acceptable (Gliem & Gliem,2003). Overall, we achieved

96.6 percent of responses as not all questions in the questionnaire were filled in by the respondents.

Table 2. Results of Cronbach's Alpha

Items	Observations	Alpha	Items	Observations	Alpha
Gender	80	0.6209	Duration with NIFI	76	0.6577
Religion	76	0.6261	Duration with NIFI^2	76	0.5260
Age	80	0.6295	Household Location	80	0.6229
Education	80	0.6174	YOB experience	77	0.5620
Household size	78	0.6230	Having Account with NIFI	80	0.6263
Household size^2	78	0.6222	ATM use	77	0.6222
Income	79	0.6139	ATM usage	63	0.6267
lincome^2	79	0.6037	USSD use	77	0.6214
			Overall Test scale		0.6234

Results of Logistic Regression Models

Financial Inclusion Model Through Access to Financing

Equations 7a and 7b results are presented in Table 3 as models 1 & 2, respectively. Access to financing, a barometer of financial inclusion from NIFI. Columns (1) and (3) capture the coefficients of the predictor variables while columns (2) and (4) contain their respective odds ratios. The first model incorporates socioeconomic determinants of financial inclusion whereas the second model captures other determinants peculiar to the research respondents. In the first model, the marital status coefficient, which is statistically significant at the 10 percent level, suggests that married people have lower log odds of accessing finance compared to unmarried or single by about -2.4 units and an odds ratio of 0.09.

Similarly, compared to those with nonformal and primary education, higher qualification, generally, negatively correlates with access to finance by up to -4.2 units and an odds ratio of 0.015 in the case of graduates. Equally, the coefficient of those with postgraduate qualifications is robustly significant at the 5% level with an odd ratio of 0.057, as well. Intuitively, this fits both sides of a coin. On the one hand, it could mean that households with higher qualifications are less likely to request financing as they are most likely to be engaged in formal sectors of the economy. On the other hand, higher qualifications, all things being equal, attract a higher fixed income, otherwise good cash flow, which is a stimulus for taking a bank facility and is convenient to the banks as well.

Furthermore, the model shows that although income does not play a significant role in determining access to financing, households' size does, but negatively. An increase in households' size by 1 reduces the chances of accessing financing by -0.25 units. Moreover, households' location also matters for access to financing given the statistical significance of its coefficient at the 1 percent level. With a log of odds of -3.42 and an odd ratio of 0.033, it implies that urban customers are less likely to access financing than those in rural areas. This conforms to a priori expectations.

Table 3. Access to Financing from NIFI

	Model 1	Model 2		
Variable	(1) Coefficient	(2) Odd Ratio	(3) Coefficient	(4) Odd Ratio
Gender	-0.558	0.572		
	(0.820)	(0.470)		
Age	0.000489	1.000		
	(0.00042)	(0.00042)		
Marital status	-2.402*	0.0906*		
	(1.235)	(0.112)		
Secondary education	-2.261*	0.104*		
	(1.276)	(0.133)		
NCE/Diploma education	-3.108**	0.0447**		
	(1.412)	(0.0631)		
HND/Degree education	-4.188***	0.0152***		
	(1.370)	(0.0208)		
Postgraduate education	-2.871**	0.0567**		
	(1.221)	(0.0692)		
Household size	-0.249***	0.780***		
	(0.0862)	(0.0672)		
Income	4.99e-06	1.000		
	(1.20e-05)	(1.20e-05)		
Household location	-3.419***	0.0327***		
	(1.086)	(0.0356)		
Having an account with NIFI			-0.454	0.635
			(0.984)	(0.625)
NIFI Nearness to home			0.449	1.567
			(1.070)	(1.677)
NIFI Nearness to Working place			2.811***	16.62***
			(1.019)	(16.94)
NIFI Nearness to market			0.467	1.595
			(1.096)	(1.748)
Time taken to reach NIFI			-0.0406	0.960
			(0.0421)	(0.0404)
Duration with NIFI			0.418*	1.519*
			(0.226)	(0.344)
Years of Business (YOB) experience			1.344*	3.834*
			(0.783)	(3.002)
Constant	7.501***	1,811***	-3.674**	0.0254**
	(2.463)	(4,460)	(1.722)	(0.0437)
Number of Observations	73	73	56	56

*Note: Robust standard errors in parentheses and *** p<0.01, ** p<0.05, * p<0.1*

The second model features three statistically significant coefficients at 10 percent or better; nearness of NIFI to working place, duration with NIFI, and YOB experience of customers, in addition to the intercept. A positive and significant coefficient of the nearness of NIFI to the workplace not only increases the frequency of visits and forging a greater relationship with the bank but the likelihood of accessing a facility by up to 2.81 units as well. Similarly, the coefficient

of years spent with NIFI signifies that an additional year with Jaiz Bank increases the log odds of accessing more financing by 0.42 and an odd ratio of 1.52. The latter suggests that households that have more years of banking experience are 1.52 times more likely to get financing than those with fewer years of banking experience. Equally, YOB experience, in line with a priori expectation, increases the log of odds of accessing more financing from Jaiz Bank by 1.34 and an odds ratio of 3.83, which implies that years of business experience accords 3.83 chances of obtaining financing over starters or those with less years of business experience. The findings in the two models, generally, support evidence in the literature by Abdu et al., (2018) in a panel study using SSA and OIC countries; Trianto et al., (2021) and Abdullah Othman and Kassim (2021) both in Indonesia. However, Khmous and Besim (2020) in a sample comprising of MENA and African countries found that education, among other findings, does not affect financial inclusion.

Financial Inclusion Model Through the Use of ATM Card

Table 4 reports the results of access to financial services using an ATM card as specified in equations 8a and 8b. In particular, the coefficient of household size was found to be positively and statistically significant at the 10 percent level. This implies that an additional member in the household increases the use of an ATM card for banking services by about 0.67 units. This is in line with a priori expectation because as family size increases, the frequency of the family's transaction also increases in tandem. Furthermore, checking for nonlinearities, the squared coefficient of this variable was found to be negative and statistically significant at the 10 percent level. This implies that when household size increases, the use of ATM card also increases until a certain threshold is reached after which it decreases, which is in line with the a priori expectations. As explained earlier, while households' location increases the log of odds of using an ATM and its probability as well, YOB experience lowers both the log of odds and the probability of using an ATM.

Table 4. Access using ATM card

Variables	MODEL 1		MODEL 2	
	(1) coefficients	(2) ME	(1) Coefficients	(2) ME
Gender	-0.621	-0.0710		
	(0.887)	(0.0887)		
Marital status	-0.0967	-0.0128		
	(0.784)	(0.106)		
Household size	0.670*	0.0877		
	(0.379)	(0.0535)		
Household size^2	-3.409*	-0.446*		
	(1.806)	(0.256)		
Household location	1.323**	0.220*		
	(0.663)	(0.129)		
YOB experience	-1.340**	-0.175**		
	(0.675)	(0.0890)		
YOB experience^2	0.105**	0.0137**		
	(0.0507)	(0.00660)		
NIFI Nearness to home			2.264	

Variables	MODEL 1 (1) coefficients	(2) ME	MODEL 2 (1) Coefficients	(2) ME
			(1.436)	
NIFI Nearness to workplace			4.641***	
			(1.690)	
NIFI Nearness to market			2.205	
			(2.014)	
Time taken to reach NIFI			-0.171***	-0.00888***
			(0.0640)	(0.00332)
Primary education			-	
Secondary education			-	
NCE/Diploma education			2.091	
			(1.779)	
HND/Degree education			1.316	
			(1.461)	
Postgraduate education			3.388	
			(2.928)	
Income			3.717***	0.193***
			(1.079)	(0.0560)
Duration with NIFI			-5.274*	-0.274*
			(3.138)	(0.163)
Duration with NIFI^2			6.149*	0.319*
			(3.651)	(0.189)
Constant	12.31***		-36.06***	
	(4.598)		(12.07)	
Observations	71	71	48	48

*Note: Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. ME signifies the marginal effect of coefficients.*

Furthermore, results from our second model, in addition to the nearness of NIFI to the workplace, distance, number of years of banking experience, and income are all statistically significant and correctly signed. For instance, a naira increase in income increases *log* of odds of using ATM for banking transactions by 3.72. The marginal effect coefficient t reveals that the probability of using ATM increases by 0.19 for any unit increase in income. Generally, our findings in the two models concur with Abdu et al., (2018) in OIC and SSA countries and Akhter et al., (2019) in Indonesia on analysis of demand-side determinants of financial inclusion.

Financial Inclusion Model Through the Use of USSD Code

Using the constructed model of financial inclusion on the use of USSD code for banking transactions as specified in equations 9a and 9b, we present the results of the estimated model in Table 5. The model was estimated at two levels as presented in columns (1) & (3) and (2) & (4) for coefficients and marginal effects, respectively. Looking at the coefficients, the age of households is averse to the use of USSD for banking transactions. The coefficient is both

statistically significant at the 5 percent level and conforms to the a priori expectation. A 1-year increase in the age of a household, for instance, lowers the log odds of using USSD for banking transactions by -0.052. The marginal effect of a unit change in USSD to a change in household age is negative at -0.0123 units. In other words, the use of USSD code for banking transactions diminishes with households' age and this fits our a priori expectations.

Table 5. Access Through the Use of USSD Code

Variable	MODEL 1		MODEL 2	
	(1)	(2)	(3)	(4)
	Coefficient	ME	Coefficient	ME
Gender	-1.313	-0.267		
	(0.863)	(0)		
Age	-0.0521**	-0.0123**		
	(0.0262)	(0.00611)		
Income	4.922**	1.158**		
	(2.045)	(0.464)		
Income^2	-4.70e-10**	-1.10e-10**		
	(1.91e-10)	(0)		
Household location	1.702**	0.401***		
	(0.736)	(0.155)		
Household size	-0.108*	-0.0254**	-0.157**	-0.0344***
	(0.0555)	(0.0125)	(0.0614)	(0.0125)
Income^2			0.180	0.0395
			(0.353)	(0.0773)
Duration with NIFI			2.230*	0.488*
			(1.320)	(0.281)
Duration with NIFI^2			-0.396*	-0.0868*
			(0.232)	(0.0497)
Time to reach NIFI			0.0166	0.00365
			(0.543)	(0.119)
YOB experience^2			-0.0215***	-0.00471***
			(0.00776)	(0.00162)
Constant	-48.28**		-2.932	
	(21.18)		(8.232)	
Observations	74	74	64	64

*Note: Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. ME signifies the marginal effect of coefficients*

Similarly, the coefficients of income of households in both its nominal and squared forms are statistically significant and consistent. The latter coefficient confirms the nonlinearity nature of the relationship between income (at higher levels) and the use of USSD code for transactions. Note that the USSD is designed for small cash transactions, which are averse to age and those with higher income. This notwithstanding, the coefficient shows that a unit increase in households' income increases the log odds of using the USSD code by 4.92 units, and the slope, measured by marginal effect stood at a positive level, 1.158 units. Households' location in the model also bounces as a consistent and robust coefficient at the 5 percent level. This means that households located in urban areas have higher log odds of using the USSD code for banking

transactions as opposed to those in the rural area higher by 1.70 a marginal effect of 0.4. This finding is instrumental and quite in tune with intuition.

The coefficients of household size were correctly signed and statistically significant at 10 percent and better in both models. A higher family size lowers the log of odds of using USSD code by -0.11 and -0.16, in the two models, respectively. Corresponding marginal effects reveal that the probability of using the USSD is less as household size expands by up to -0.025 and -0.034, respectively. Furthermore, households' duration with NIFI in both its nominal and squared forms brace with statistically significant and correctly signed coefficients and the latter confirms nonlinearity in the relationship given its negative sign. Similarly, YOB experience in squared form is robustly significant at the 1 percent level and correctly signed. The marginal effect reveals that the probability of using the USSD code falls by -0.00471 as the relationship turns nonlinear by the square of YOB experience. In addition to their theoretical congruency, findings are in tune with those reported by Abdu, Jibir, Abdullahi, and Rabi'u (2018) in a panel study using SSA and OIC countries; Akhter, Majeed, and Roubaud (2019) in Indonesia and Khmous and Besim (2020) in a sample comprising of MENA and African countries in their analyses of demand-side determinants of financial inclusion.

V. Conclusion and Recommendation

Financial inclusion is an omnibus concept, that could be used to achieve multiple goals, inclusive growth, financial stability, equitable distribution, poverty reduction, economic growth, and development. In other words, it can mutate all the consequences of financial exclusion. With over a decade of operation on Islamic banking in Nigeria presaged by the licensing of Jaiz Bank plc, this paper embarks on a preliminary investigation of predictors of Islamic financial inclusion in Northwest Nigeria.

Guided by threshold decision-making theory, the paper constructs three logistic regression models using the demand side dimension of financial inclusion: access to financing, use of ATM and USSD code for effecting financial transaction. The paper establishes that while the access to financing logistic model outperforms the other two models, rural households exhibit more desire for financing than their counterparts in the urban areas. Further, households' location and years of business (YOB) experience remain robustly significant across all the models implying that those in the urban areas coupled with more years of business experience tend to be more financially included than their equals in the rural areas. However, the age of households and YOB experience are averse to the use of ATM card and USSD code for banking transactions, the paper found.

The importance of financial inclusion cannot be overemphasized, the paper, considering the findings recommends, although years of business experience and location feature as key predictors, NIFI should collaborate with donor agencies, non-governmental organizations (NGOs), and relevant government programs to strengthen the capacity of small businesses in the rural areas to enhance access to financial resources. Year of business experience (YOB) is a significant determinant of firms' access to financing but inversely correlates with the use of ATM and USSD

codes, henceforward, NIFI should introduce internet banking to this category of business operators to extend access to financial services. Customer literacy on security and use of ATM and USSD facilities should be enhanced to protect secure deposits of unsuspecting customers against internet crimes; and as financial engineering continues to evolve, more user-age-friendly financial products and services need to be developed to cater to their financial needs with minimum distress. This is so as age is averse to the use of USSD code for banking transactions, hence the need for product innovation to cater to the needs of the aged households.

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Conflicts of Interest

The authors declare no conflict of interest.

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