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The Role of ICT-Driven Financial Literacy in Enhancing Household Enterprise Development

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Abstract

This study examined the relationship between financial literacy, information and communication technology (ICT) adoption, and the performance of household enterprises in Nigeria. Using data from the Global Findex 2021 survey, the analysis employed Logit and Two-Stage Least Squares (2SLS) instrumental variable regression models to explore how financial knowledge and digital tools influence the likelihood of establishing or expanding household businesses. Descriptive results reveal that only 37% of Nigerian firms operate as household enterprises, reflecting limited contribution to national output. Indicators of financial literacy remain low, with just 14% of households saving for retirement and 31% using debit cards, while ICT adoption is moderate, as 77% of households own mobile phones but only 6% make online payments. Empirical findings demonstrate that ICT adoption and financial literacy significantly and positively affect household enterprise participation, suggesting that access to digital finance and basic financial knowledge enhances entrepreneurial capacity. Workforce participation and respondents' age also show significant effects, whereas income, education, and gender are not statistically significant. The 2SLS results further validate that financial literacy indicators, such as saving behaviour and use of digital financial services reinforce enterprise activity. Thus, underscoring the need for targeted interventions, including integrating financial education into school curricula, community training, and expanding ICT infrastructure to stimulate household-level entrepreneurship.

Keywords: *Financial Literacy, ICT Adoption, Household Enterprises, Digital Inclusion.*

Introduction

The global pursuit of financial awareness alongside information and communication technology (ICT) development toward the economy is necessary for the enhancement of household businesses. This is because household enterprises such as retailing, and small family farms, among others, are seen as an avenue for development especially for developing economies, especially Nigeria as a result of their complex structural nature. Over the years, there has been several remarks on how financial literacy and ICT adoption impacts household businesses and the level of government influence.

Theoretically, financial market is a very complex and competitive environment, and household business owners(entrepreneurs) become more vulnerable to complexities in the financial market when they lack basic information about the market thus, the importance of financial literacy. Also, studies have shown that entrepreneurial financial literacy enhances access to the utilization of certain essential financial services which facilitates household business enterprises to invent and exploit growth opportunities (Nunoo & Andoh, 2011).

Therefore, the need for financial knowledge especially in the 21 centuries where technology alongside with financial services has been progressively combined to improve the economy agency [household, firm, and government], has been acknowledged as an outstanding breakthrough toward the economic development of both developed and developing countries like Africa. Thus, with endowed

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natural resources and the existence of technology, investment is been carried out to increase their return on investment, thus business owners and start-up businesses need efficient planning and maximum financial knowledge to minimize their costs and maximize wealth, given that financial knowledge is essential to financial freedom for businesses.

According to Raath, (2013) financial literacy is about discernment and making effective decisions on the utilization of financial management. Financial knowledge helps not only an individual but the government and businesses as it creates a sense of value judgment, in other to analyze various investment deals to make an effective financial decision to obtain the best with its limited resources in order to improve household enterprises.

Furthermore, household enterprises are businesses or enterprises owned and managed by family members. Given its limited resources, production is done in little quantities and most times it involves a minimum of two and a maximum of five groups of people. This area of business deals majorly with trading, usually in smaller quantities. Given the complex structure of developing countries like Nigeria and their level of poverty rate and inequality, Nigeria is seen as a member of a third-world country who has a large percentage of these businesses. Also, due to the complex nature of businesses in Nigeria, most of the businesses are either not registered by the government or operate without a government license. Thus, making it difficult to account for this business and the ability to fund them. The household sector is majorly known as an informal sector, because of its complex nature and its unaccountability, thus, this sector faces a high rate of crime, insecurity, and low profit as a result of its limited resources.

One key factor that can help household enterprises is financial literacy of the entrepreneur, as it plays a key role in the relationship between the borrower and the lender and the performance of businesses. However, Nigeria has been known to be affected by the level of financial literacy among business owners in the country given the key effect financial literacy helps in the financing decision of the business and determination of their productivity. On a global scale, financial literacy has been known to cause the rise and fall of many companies in the world and Nigeria is not an exception. Thus, financial literacy is seen to be a key factor in driving economic growth Van Auken (2005).

Therefore, in running a household enterprise, an entrepreneur needs to be financially literate for many reasons but the main reason is so as to obtain the financial resources required to run the business. This study is clasped on resource-based theory. It views financial resources as essential resources for the acquisition and configuration of other resources and entrepreneurs must be financially literate to manage their businesses appropriately (Brinckmann et al., 2011). At the macroeconomic level, household businesses in most developing countries are the backbone of their economy, and when entrepreneurs' financial literacy skills are insufficient, it affects the success of the enterprises, (Dahmen & Rodríguez, 2014). On the other hand, other studies have shown that ICT progress coupled with financial literacy and other factors are more sufficient to operate a business enterprise in Nigeria.

Firstly, ICT tools such as mobile phones and the internet provide a platform for entrepreneurs to able to access or obtain financial information at any point in time when needed. Thus, the financial system in every economy serves as a key factor in driving economic growth in. In recent times, the degree of financial literacy in many nations especially amongst small and medium enterprises (SMEs) entrepreneurs has become a burning issue for researchers, professionals, authorities' agencies, coverage makers, and economic institutions (Okanta, 2018; Khadija & and Wan, 2018; Gathungu & Sabana, 2018; Musabwasoni, Mulyungi & Muganamfura, 2018). This is because of the incessant distressed syndrome experienced by SMEs across the globe, especially in developing countries, which has been attributed to financial illiteracy (Oke, 2018). In line with this statement, Sajuyigbe, Adeyemi, and Odebiyi (2017) argue that truly each small business entrepreneur lacks simple financial competencies that ought to, in principle, guide their financial decisions accordingly. In another study, Disney and Gathergood (2013) exhibit that these entrepreneurs lack simple financial information, and find it extraordinarily difficult to have access to finance for the growth of their operations. Studies carried out confirmed SME owners' ignorant due to the lack of financial literacy (Rathnasiri, 2015; Okpara, 2011).

In Nigeria today, household business enterprises find it difficult to be able to grow and the government over the years has invested its time in trying to improve this sector by providing different financial services, as well as investment in ICT technology used in businesses to improve their quality and help these businesses compete in both their local and international markets. Also, steps have been taken by the government over the years to ensure that these financial services, coupled with their connection to ICT technology, help in the growth of these businesses. These include; the establishment

of the national financial inclusion strategy by the central bank of Nigeria on the year 23rd of October 2012, but little progress has been recorded over time compared to the global economy. According to the National Bureau statistics, 77 percent of the urban areas were made up of household businesses, and 62 percent of the rural area, showing that less than 8 percent of these businesses registered and licensed by the government.

Thus, implying that successful household businesses mostly thrive in urban areas because urban areas are characterized by high ICT usage. According to the Nigerian Communication Commission (NCC) in the first half of 2015, the number of ICT usage increased by about 13.6%, This brought the number of mobile internet users to about 92.6m in Nigeria, with over three-quarters of that being attributed to urban users, therefore we can say most successful household enterprises are located in urban areas within Nigeria like Lagos, Abuja, Abia, Port-Harcourt, and the reason for this is because of the high amount of ICT usage and free flow of financial information in Urban areas which have grossly attributed to the success of such businesses.

Thus, the applications and impacts of ICT on the overall economy can be said to be broad and pervasive. Much of the current wave of globalization sweeping across the globe has been attributed to the rapid innovations in ICT. Indeed, ICT has prompted remarkable changes in the Nigerian economy in the last three decades. Though the nature and direction of these spectacular changes are difficult to predict owing to the pervasive nature of ICT, it remains obvious that these ICT-induced changes will continue at least in the foreseeable future. This is because ICT has become a central part of modern life in Nigeria: we chat, text, email, and tweet on cell phones; we work, teach, learn, research, shop, and entertain ourselves on the internet; and we eagerly await the next innovation from the world of ICT (The Conference Board, 2011).

However, advances in ICTs have led to more complex ICT tools and systems that have wide applications and coverage. Some of these new ICTs include mobile phones, television, computers (PCs, laptops, IPADs, and other handheld computer devices), email, video conferencing, the internet, and expert systems (Okoye, 2012). Other ICT-enabled applications widely used in Nigeria are Facebook, Twitter, Instagram, Blackberry Messenger, Skype, WhatsApp, YouTube, and a host of other mobile applications (Islam & Islam, 2006).

Interestingly, most banks in Nigeria, particularly deposit money banks, have now developed mobile banking applications that customers can use to perform banking transactions through their personal computers, mobile phones, and other handheld devices. Such mobile banking applications enable customers to make instant funds transfers, pay utility bills, buy mobile phone airtime or top-ups, air tickets, and lots more. These developments make it imperative that the role of ICT in financial literacy in Nigeria should be reviewed to evolve more informed policies that will guide the use of ICT to drive financial literacy in the operation of household businesses in the country. Herein lies the root of the problem that warrants this study. Therefore, this study investigated the link between financial literacy, and household enterprises, taking into consideration the complexities of the financial markets, coupled with a competitive environment.

Empirical Review

Oluwatayo (2014) examined how information and communication technologies drive economic growth in Nigeria with focus on small-scale businesses in rural areas. The outcome of the study based on information gathered from 350 small company owners in Southwest Nigeria revealed that only over a quarter had completed a university education, and roughly 43% had no formal education.

Also, farming was seen as the greatest employer of labor as it provided a living for more than 67 percent of those surveyed. Mobile phones, the internet, television, radio, video cameras, digital cameras, and cam-coders were found to be the ICTs commonly used and the usage led to cost savings, ease of marketing, and a huge increase in the revenues of small business owners. However, Tuyisenge, Mugambi, and Kemirembe (2015) investigated the role of financial literacy on loan repayment among small and medium entrepreneurs in Rwanda using Urwego Opportunity Bank as the case study. The study concentrated on 109 small and medium-sized business owners at Urwego Opportunity Bank. The study's findings revealed that the quality of financial information provided to financing institutions is quite low. Additionally, it showed that managing the loan book was challenging and that access to credit was significantly worsened by high-interest rates, collateral requirements, and collateral costs.

Malgit and Ambrose (2017) examined financial literacy and its impact on investment decisions in Nigeria. The study found that financial literacy is an applicable instrument for predicting investment decisions taken by individuals. The study outcome indicated that organizations and individuals should invest in building financial literacy as higher financial literacy is positively related to successful investment decisions. Ogundana, Okere, Ayomoto, Adesanmi, Ibidunni, and Ogunleye (2017) examined the relationship between ICT and the Accounting system of SMEs in Nigeria. Using the Pearson Product-Moment Correlation Coefficient, the study also assessed a strong association between ICT adoption (accounting packages) and the accounting system of SMEs in Nigeria. Findings showed a substantial relationship between ICT knowledge (Microsoft tools) and the accounting system of SMEs in Nigeria.

Juma Buhimila and Han Dong (2018) examined the dual effects of SME financial literacy and technology use on record-keeping and risk-management practices. The partial least square structural equation modeling method was employed findings suggest a substantial relationship between a firm's use of technology and its record-keeping procedures and performance, as well as a significant positive correlation between financial literacy and a firm's risk management procedures.

Though the study discovered a negligible correlation between financial literacy and business bookkeeping methods, it has nonetheless unlocked a dual practical function for financial literacy and technology use in enhancing SMEs' financial practices in developing nations. Usama and Yusoff (2019) set out to determine how financial literacy affected the commercial performance of entrepreneurs in Nigeria's Bauchi city. The study found that the performance of entrepreneurs was statistically influenced by financial literacy. The study presents the claim and broader viewpoint that financial literacy is a significant determinant of the success of entrepreneurial businesses.

A study by Khadijah and Wan (2019) investigates the influence of financial literacy on SMEs' performance with particular reference to SMEs in the Bauchi metropolis of Nigeria. The result indicates that financial literacy has a significant influence on SMEs' performance. Similarly, Usama and Wan (2018) conduct a study on the relationship between financial literacy and business performance in Nigeria. The finding indicates that a statistically significant relationship exists between financial literacy and business performance. In the same vein, the study of Mutiso and Muigai (2018) conducted in Kenya, establish a significant positive relationship exist between financial literacy and the performance of SMEs. Another study conducted in Kenya by Gathungu and Sabana (2018) also reaffirm the positive and significant relationship between financial literacy and SMEs performance. Okanta (2018) also uses a one-way analysis of variance (ANOVA) and student t-test to examine the effect of financial literacy on the performance of small-scale enterprises in Nigeria. The result confirms that financial literacy has a strong effect on small-scale enterprises' performance.

Odebiyi et al., (2020) examine the influence of financial literacy on the performance of SMEs with particular reference to SMEs registered with the Lagos Business Directory. The outcome shows that the majority of SME operators only had a basic understanding of addition and subtraction using a calculator. It follows that the majority of the little business owners lacked a range of financial expertise. Additionally, it was shown that the various aspects of financial literacy interact to affect how well SMEs succeed.

Odetayo, Sajuyigbe, and Adeyemi (2020) investigated the impact of financial inclusion and financial literacy on small businesses' overall performance with special reference to southwest Nigeria. The results show that financial inclusion and financial literacy have an impact on small enterprises' performance both together and separately. It showed that financial inclusion and financial literacy have a favorable and significant association. But the report shows that the majority of business owners didn't possess financial expertise in areas including budgeting for cash, working capital management, accounting records system, financial reporting, cashbook maintenance, income statement, and daily cash reconciliation.

Lontchi, yang, and Su (2022) examined the mediating effects of financial literacy and the moderating role of social capital on the relationship between financial inclusion and sustainable development in Cameroon. A PLS-SEM model was used and financial inclusion was found to be positive and significantly related to financial literacy and to have a positive and significant impact on sustainable development. Financial literacy and social capital positively and significantly affect sustainable development in Cameroon. However, financial literacy mediates, while social capital does not moderate the relationship between financial inclusion and sustainable development.

Likewise, Olubunmi and Rufus (2023) examined the interplay between financial technologies and financial inclusion in emerging economies, especially from the Nigerian perspective. The study adopted the exploratory research design involving an extensive review of related published materials including statistics obtained from reputable sources such as the World Bank, the Enhancing Financial Inclusion Surveys, and the Global Findex reports. The study found that while the deployment of financial technologies has aided the financial inclusion drive in Nigeria, progress is still being hampered by challenges relating to poor system interoperability, socio-cultural induced gender sensitivities, concerns of data privacy breaches, and over-serving of cities by FinTech to the detriment of priority rural areas.

Furthermore, Addo and Asante (2023) examined the effect of financial literacy on SMEs' access to finance in developing economies. The Partial Least Square Structural Equation Modelling (PLS-SEM) was used and the study found a significant positive association between financial literacy and access to finance. Financial literacy also had a positive significant effect on risk attitude, whereas the link between risk attitude and access to finance was also found significant. Again, the study showed that risk attitude matters in the nexus between financial literacy and access to finance, as it was found to mediate the link between financial literacy and access to finance. Their findings affirm the dual process theory of reasoning where an entrepreneur's decision to access finance is guided by two systems of thinking: the automatic unconscious system based on their risk attitude, and the deliberate conscious system where different considerations and models are weighed up based on their financial literacy, both of which serves to magnify or dampen rational decision-making to access business financing. The findings also affirm the Knowledge base view theory (KBV) that financial literacy is a special strategic asset organization can use to obtain a competitive advantage over competitors. Practically, SMEs will be encouraged to improve their financial literacy and risk attitude skills.

Adeleke (2023) examined the various areas by which these ICTs have created job opportunities as well as the innovations acquired. The findings showed that ICT is influencing employment by giving access to new forms of work in more flexible ways, making labor markets more innovative, inclusive, and global. Also, ICT was found to have a significant relationship in producing a series of jobs implying that ICT creates Mass media, graphics design, word processing job opportunities, network technicians as well as Web developers. The study revealed the possibility of jobless or displacement for ICT non-knowledgeable and that ICT gives an avenue for fraud and scamming which is disastrous to its usefulness in our society.

Widyastuti, Ferdinand, and Hermanto (2023) aimed to test financial literacy and credit conditions in determining formal credit access to determine the performance of MSMEs. The research included the type of associative research that is accompanied by hypothesis testing. The result show that financial literacy and credit terms directly and significantly affect access to formal credit and MSME performance; formal credit access directly and significantly affects MSME performance. Likewise, financial literacy and credit terms indirectly affect the performance of MSMEs. These results mean that financial literacy and credit terms have a strategic role in explaining why access to formal credit is growing and is attracting MSMEs to strengthen capital to improve performance.

Yang and Zhang (2022) provided evidence for China on how FinTech adoption enhances household consumption and reduces consumption inequality. The region-level FinTech adoption measures and household data were used. The instrumental variable estimations revealed that digital financial tools foster inclusion by promoting consumption among low-consuming households. Mushtaq, Murtaza, Yahiaoui, Alessio, and Talpur (2023) examined the role of financial literacy and ICT adoption in household financial decisions across low- and middle-income households in Pakistan. The probit model was employed and findings revealed that higher financial literacy improves savings and budgeting, while ICT adoption enhances financial market participation.

Xie and Chen (2024) demonstrated that digital financial literacy significantly promotes household entrepreneurship in China using instrumental variable estimation. The effect was most pronounced in rural and underdeveloped regions and mediated through access to formal finance, showing inclusive potential for women and less-educated individuals.

Affandi et al., (2024) analysed digital adoption among over 5,000 micro and small enterprises in Indonesia, using regression and 2SLS models. They found that digital adoption enhances both business performance and financial literacy, highlighting a two-way relationship between technology use and knowledge improvement.

Bibi, Zada, Awan, Wong, and Khan (2024) explored the interaction of governance, ICT infrastructure, and social inclusion on financial inclusion across 46 countries using panel-corrected standard errors, FMOLS, and DOLS. Their results revealed that governance and ICT infrastructure jointly improve financial inclusion, while weak institutions hinder inclusivity.

AlSuwaidi and Mertzanis (2024) connected financial literacy to FinTech market expansion across 114 countries from 2013 to 2019. The BIS and World Bank data was used and they found a strong nonlinear relationship, concluding that higher national literacy levels accelerate FinTech adoption and market growth. Jin, Ma, and Tan (2024) provided evidence from China that digital financial inclusion alleviates energy poverty by improving energy efficiency and income diversification. However, threshold analysis showed that digital access is a prerequisite, and spatial spillovers may create inequality in neighbouring regions.

Awaluddin, Khair, Paula, Zainal, and Sutomo (2025) assessed the impact of financial literacy and digital financial applications on household consumption patterns in Makassar, Indonesia. Using the multiple linear regression, findings show that digital financial application and financial literacy significantly influence consumption, explaining 62.7% of behavioural variation. Financial literacy fostered rational spending, while digital financial apps enhanced convenience but risked impulsive consumption when financial awareness was low. Hu and Liu (2025b) investigated the relationship between the digital economy, financial literacy, and rural households' financial risk-taking using Chinese panel data. Their probit–tobit results showed that digital economy development increases financial market participation and that financial literacy mediates this effect by enhancing risk awareness and preferences.

Başar et al., (2025) conducted a cross-country study on digital financial literacy and savings behaviour in 12 nations using a multi-level model with 30,000 participants. They found that FinTech use boosts savings, particularly where financial literacy is high and digital infrastructure is reliable. The impact was stronger in rural areas when digital access was supported by adequate connectivity. Khan (2025) examined mobile money's contribution to financial inclusion among informal enterprises in Asia and Africa using instrumental variable probit and non-parametric methods. The results showed that mobile money promotes deposit-based and credit-based inclusion and enhances profitability and trade credit access.

Methodology

This study appraised the impact of ICT on household enterprise performance in Nigeria and to evaluate the resultant effect on financial literacy in Nigeria. The theoretical basis for the study is both the endogenous technological change propounded by Romer (1986) and the Business model. According to Romer (1986) model of endogenous growth, there is an automatic spillover effect caused by the adoption of new technological knowledge. An investment in new technology yields an automatic spillover of new knowledge that can be utilized in the production process to enhance efficiency and performance.

Endogenous technologies in this case represent the innovative potential of the firm. It refers to the significant and minimal technological processes developed by analyzing, adapting, exploiting, and replicating previously developed technologies. It claims that increased performance is directly linked to faster innovation and greater government and private sector investments in human capital. This extends to the idea that government and private investment in human capital increase the employability of individuals, reducing unemployment levels in the nation. This is the case, as employable individuals are matched with highly performing enterprises (due to faster innovation).

This, therefore, improves the absorptive capacity of the enterprises to employ efficient labor. This validates the first and second objectives of this study. Romer describes the aggregate production function as

$$Y = L_Y^{1-\propto}(x_1^{\propto} + x_2^{\propto} + \cdots + x_A^{\propto}) = L_Y^{1-\propto} = \sum_{i=1}^{A} (n_k)^{\propto} \quad (1)$$

Where, L_Y refers to the number of workers producing output in the enterprise. The x_i's denote the different types of capital goods, A is the term for technological change. Note that a significant characteristic of this model is that diminishing marginal returns apply to each of the individual capital goods (captured in 0 < α < 1). Assuming a scenario where A is fixed, the diminishing returns pattern that accrues to each capital good would imply that productivity or growth would eventually amount to 0.

From this analogy, we can denote that A is not fixed in the Romer model. A has to change in value for a firm or enterprise to witness growth or increased performance. In other words, technology or innovation has to improve if any enterprise desires improved performance and growth. According to this hypothesis, there should be a correlation between financial literacy and household enterprise, specifically information and communication technologies. In line with this theory and the work of Amjad (2016), the model specification for the study is seen below:

$$f(H) = \frac{1}{1+e^{-H}} \quad (2)$$

Where H is defined as

$$H = \alpha_0 + \alpha_1 Z_1 + \alpha_2 X_2 + \alpha_3 W_3 + \alpha_4 Y_4 + \mu_I \quad (3)$$

F(h)= the probability of the household businesses with a value between 0 and1, z_1 = represents financial literacy with a value between 0 and 1, X_2 = represents ICT with a value between o and 1; W_3 = represents household characteristics with a value between 0 and 1; Y_4 = represents welfare characteristics with a value between 0 and1; α_0 = the constant; α's = regression coefficients to be estimated.

The econometric (estimated) form of the model is specified as follows:

$$logit(pi) = in\left(\frac{pi}{1-pi}\right) = \alpha_0 + \alpha_1 Z_1 + \alpha_2 X_2 + \alpha_3 W_3 + \alpha_4 Y_4 + \mu_I \quad (4)$$

Where; $\frac{pi}{1-pi}$ =

μ_I = the error terms

According to the theoretical framework, the *a-priori* expectations are as follows.

$\alpha_0 > 0, \alpha_1 > 0,\ \alpha_2 > 0, \alpha_3 > 0\ , \alpha_4 > 0$

The log-odds function, commonly referred to as a logit function, is a function that depicts probability values from 0 to 1, as well as from negative infinity to infinity. The function is the opposite of the sigmoid function, which restricts values between 0 and 1 to the Y-axis as opposed to the X-axis. The Logit function is typically used to understand probability because it only applies to a range of values between 0 and 1.

Simple non-linear transformation of the linear regression results in the logistic regression model. Similar to the standard-normal distribution (which yields a probit regression model), the "logistic" distribution is an S-shaped distribution function that is more practical to use in most applications (the probabilities are easier to calculate). This type of statistical model (also known as the *logit model*) is often used for classification and predictive analytics. Logistic regression estimates the probability of an event occurring, based on a given dataset of independent variables. Since the outcome is a probability, the dependent variable is bounded between 0 and 1. In logistic regression, a logit transformation is applied to the odds—that is, the probability of success divided by the probability of failure.

The data used for this research was drawn from the Global Findex 2021 database which made use of survey data covering almost 128,000 people in 123 economies, representing 91 percent of the world's population. The survey was carried out over the 2021 calendar year by Gallup, Inc., as part of its Gallup World Poll, which since 2005 has annually conducted surveys of approximately 1,000 people in each of more than 160 economies and over 150 languages, using randomly selected, nationally representative samples.

The target population is the entire civilian, noninstitutionalized population aged 15 and up. But for the purpose of the research work at hand, data was only drawn from Nigeria, which on the global Findex database, was carried out on the 15th of August 2020/2021, among lower- and middle-class income owners the data covered an approximate of 1000 number of people interviewed. The data was cut across different languages which includes; pidgin English, Igbo, Hausa, and Yoruba. And all states except for Adamawa, Boron, and Yobe which represent 7% of the total population.

Table 1: Variables and Measurement

Variable	Measurement	A pro
Household BUSINESS	1 if saved or borrowed in the last 12 months with the purpose of starting or expanding a family business and 0 otherwise	NA
Used mobile phone or internet to access a financial account	1 if the household used a mobile phone to access the financial account and 0 otherwise	Positive (+)
Owns a mobile phone	1 if the household has access to a mobile phone or 0 otherwise	Positive (+)
Payment of utility bills through the Internet	If the utility bill of the business within the past 12 months was paid through the internet	Positive (+)
Use of debit card	Have a debit card and used it in the last 12 months	Positive (+)
Save for old age	1 if the respondent has saved for retirement for the past 12 months, and 0 otherwise	Positive (+)
Age	Age of the entrepreneurs in years.	+/-
Gender	1 if the respondent is a male and 0 if the responded is a female	+/-
Education	1 if the household has completed secondary school and more or 0 if the household completed primary or less	+/-
Welfare Characteristics		
Employment	1 if the household is in the labor force or 0 number the household is out of the workforce	+/-
Income	1 if the household is within the 4th and 5th [20%] income quantile is rich, 0 if the 1,2and 3rd are poor	+/-

Results and Discussion

Summary Statistics of the Variables

In Table 2, the household enterprise has a mean of 0.367, meaning that 37% of the household are involved in self-established businesses. The summary statistics table also shows that the household businesses have a standard deviation of 0.48223 and a range from 0(minimum) to 1(maximum). The use of a mobile phone to access financial accounts, is recognized as the first variable used to quantify internet and communication technologies, as it demonstrates the extent of influence on home businesses in Nigeria. The variable has a mean value of 0.212 which implies that 21.2% of Nigerian families use mobile phones to access financial accounts. With a standard deviation of 0.40911 with a range of 0 (lowest) to 1 (maximum).

The Owning of mobile phones is recognized as the second indication used to measure internet and communication technology since it demonstrates its amount of impact on Nigerian household businesses. The variable has a mean of 0.767, indicating that around 77% of Nigerian households own a mobile phone with a standard deviation of 0.423. Saving for old age is regarded as the first indicator used to gauge financial literacy in Nigeria, as it demonstrates its amount of influence on household enterprise. The indicator has a mean of 0.14, implying that 14% of households saved for old age over that time period. The standard deviation of the indicator is 0.35, and its range is 0 (minimum) to 1 (highest).

The use of debit card, is the second indicator used to measure financial literacy, as regards its impact on household businesses in Nigeria and the outcome shows a mean of 0.313, which means about 31% of the households engaged in businesses own or has a debit card in Nigeria with a standard deviation of 0.464. Making bill payments online using the internet, is the third indicator used to measure financial literacy, as regards its impact on household businesses in Nigeria and the indicator has a mean of 0.059. which means that 5.9% of household engages in businesses, and made bill payment online using the Internet, with a standard deviation of 0.24 and a range of 0(minimum) to 1(maximum).

In examining welfare characteristics, the household labor force or workforce, is the first variable used to measure the welfare characteristics of the household and it shows an average values of 0.78 which means about 78% of the total population was in the labor force and has a standard deviation of 0.415. The income of the household is the second indicator of welfare characteristics, which has a mean value of 0.514 implying that about 51% of the household receives income during that period, with a standard deviation of 0.500. also, household characteristics was examined and the first indicator is the age of the entrepreneurs in years which ranges from 15 to 99.

The average age of the household is 31.67 which means that about 31.67% of households who engage in business activity or who are into businesses were around the age of 15 and above, with a standard deviation of 13.82. Gender of the households is the second indicator of household characteristics with a mean value of 0.412, which means that about 41% of households engage in businesses in Nigeria are male with a standard deviation of 0.4924. Lastly, education is the third indicator of household characteristics which has a mean value of 0.042, meaning that about 4.2% of households engaged in businesses are educated with a standard deviation of 0.200.

Table 2: Summary Statistics of Dependent and Independent Variables

Variables	Description	Mean	Standard deviation	Minimum	Maximum
Household business	1 if saved or borrowed in the last 12 months to start or expand a family business and 0 otherwise	0.367	0.482	0	1
Use a mobile phone to access a financial account	1 if the household has access to a mobile phone to operate a financial	0.212	0.409	0	1

Logit and Marginal Effects Analysis

	account or 0 otherwise				
Own mobile phone	1 if the household has access to a mobile phone or 0 otherwise.	0.767	0.423	0	1
Saving for old age	1 the household saved for old age and 0 if the household did not save for old age	0.14	0.347	0	1
Used debit card	1 number of households engage in businesses, who own or used a debit card, and 0 number of households who do not have debit cards	0.313	0.464	0	1
Bill payment online	1 number of households engaged in businesses who Made bill payments online using the internet and 0 otherwise	0.059	0.236	0	1
Workforce	1 if the household is in the labor force and 0 if the household is not in the labor force	0.779	0.415	0	1
Income	1 if the household receives income for the return of his or her services and 0 if the household does not receive income	0.514	0.500	0	1
Age	Age of the HHH in years	31.68	13.820	15	99
Gender	1 if the household is a male and 0 if the household is a female.	0.412	0.492	0	1
Education	1 if the household engaged in businesses is educated and 0 if	0.042	0.200	0	1

	the household is not educated				

The logistic regression model is produced by a straightforward non-linear transformation of the linear regression. The household enterprise is the dependent variable and is determined by various indicators of the independent variable (exogenous variable). Financial literacy is the first independent variable, with its indicators as; Saving for old age, Using debit cards, and Bill payments online.

Internet and communication technology is the second independent variable with its indicator as; Use the mobile phone to access a financial account and Own mobile phone. While other variables are; the age of the household, the income of the household, the workforce, and gender. The p-value is used to show the significance of the independent variables. The p-value of a variable is said to be significant if it is greater than or equal to 0.1 at 10%, at 5% it is greater than or equal to 0.05, and at 1% levels, it is greater than or equal to 0.01 significance respectively. Pseudo R-Square and log-likelihood in a logit regression measure the improvement in the fit of the model that is due to the independent variable.

Logit Effect

The coefficient, saving for old age (column 1) at 1% level is considered statistically significant. This suggests that the likelihood of households saving to start or expand a family company is significantly and positively associated with the respondent's saving for retirement by 1.515. At a 5% level, the coefficient, own mobile phone (column 2), is considered statistically significant. This suggests that having a mobile phone is significantly and favorably correlated with the likelihood of a household borrowing money to start or grow a family company by 0.765. At a 5% level, (column 3) is considered statistically significant. This suggests that having a smartphone increases the likelihood that a household will borrow money to start or grow a business. by 0.526.

At a 1% level, the workforce (column 1) coefficient is considered statistically significant. This suggests that the likelihood of the household being able to launch or grow a family business is significant and positively correlated with the workforce of the household by 1.024 at the 1% level (column 2), the workforce of the household is statistically significant and positively correlated with the chance of the household's ability to launch or grow a family business by 1.238. at 1% level (column 3) is said to be statistically significant. This suggests that the likelihood of the household being able to launch or grow a family business is significant and positively correlated with the workforce of the household by 1.221.

The age of the respondents' coefficients at 5%, in column 3 is deemed statistically significant. This suggests that the likelihood of the respondents being able to launch or grow a family business is considerable and positively correlated with age by 0.010. At a 5% level, the education(cloumn3) coefficient is deemed statistically significant. This suggests that household education is significant and negatively correlated with the likelihood of the household being able to launch or grow a family business by 0.256.

Marginal Effect Result

Owning a smartphone (column 5) has a 5% level of statistical significance, thus, suggesting that the likelihood of households saving to start or grow a family company is significantly and positively associated with the respondent owning a mobile phone by 0.175. The coefficient in (column6) is deemed statistically significant at the 5% level. This suggests that the likelihood of households saving to start or grow a family company is significant and positively associated with the respondent's saving for retirement by 0.114. At a 1% level, the coefficient is statistically significant, except for old age (column 1). This signifies that the respondent's preference for saving for retirement is strong and significantly increases the possibility that households will save money to launch or grow a family business by 0.359. The workforce's coefficient is considered statistically significant at the 1% level. This means that the likelihood of the household being able to launch or grow a family business is significant and positively correlated with the workforce of the household by 0.228. statistical significance is defined as being present at a 1% level (column 2). This implies that, at the 1% level (column 3), the workforce of the household is statistically significant and positively correlated with the chance of the household's ability to launch or grow a family business by 0.271. This means that the likelihood of the household being able to launch or grow a family business is significant and positively correlated with the workforce of the household by 0.242. At 5%, the age of the respondent's coefficient in column 3 is deemed statistically significant. This indicates that the likelihood of a household being able to establish or grow a family business is significantly and positively correlated with the respondent's age by 0.002. The coefficient, education(cloumn3) at a 5% level, is said to be statistically significant. This implies that

education in the household is significant and negatively associated with the likelihood of household capability to start or expand a family business by 0.05.

Result for Logit and Marginal Effects

	LOGIT			MARGINAL EFFECT		
VARIABLE	1	2	3	4	5	6
CONSTANT	1.399*** (0.000)	2.199*** (0.000)	2.346*** (0.000)			
Use the mobile phone to access a financial account	0.118 (0.606)			0.028 (0.607)		
Own mobile phone		0.765*** (0.036)	0.526*** (0.003)		0.175***** (0.020)	0.114**** (0.002)
Saved for old age	0.515*** (0.000)			0.359*** (0.000)		
Use debit card		0.314 (0.140)			0.078 (0.140)	
Bill payment online			-0.029 (0.919)			-0.007 (0.919)
Workforce	1.024*** (0.000)	1.238*** (0.000)	1.221*** (0.000)	0.228*** (0.000)	0.271*** (0.000)	0.242*** (0.000)
Income of the household	0.046 (0.816)	0.082 (0.698)	0.2125 (0.126)	0.011 (0.816)	0.020 (0.697)	0.049 (0.124)
Age of the respondents	-0.002 (0.801)	0.004 (0.647)	0.010**** (0.045)	-0.001 (0.801)	0.001 (0.647)	0.002*** (0.044)
Education	-0.239 (0.575)	-0.706 (0.125)	-0.256 (0.464)	-0.057 (0.566)	-0.161* (0.088)	-0.056 (0.445)
Gender of the respondents	-0.017 (0.931)	-0.736 (0.731)	-0.079 (0.580)	-0.004 (0.931)	-0.018 (0.730)	-0.018 (0.579)
Pseudo R^2	0.0771	0.0447	0.0549			

Log-likelihood	-336.09	-291.29	-615.89			
X^2	0.0000	0.0003	0.0000			

Source: Researcher's Compilation, 2021 using Stata 15

Note: *, ** and *** means significance at 10percent, 5 percent and 1 percent, respectively

Instrumental Variables (2SLS) Regression and the Marginal Effect.

In the two-stage least-squares regression, the estimated values of the problematic predictor(s) are first calculated using instrumental variables that are uncorrelated with the error terms, and the estimated values are then used to compute an estimated logistic regression model of the dependent variable. In a regression analysis, an instrumental variable is a third variable that is correlated with the predictor variable but uncorrelated with the response variable. This variable makes it feasible to determine the actual causal relationship between a predictor and a response variable.

Instrumental variables (2SLS) regression result

The coefficient, preserved for old age (column 1), is deemed statistically significant at 1% level which suggests that the likelihood of households saving to start or grow a family company is significantly and positively associated with the respondent's saving for retirement by 0.348. Also, the coefficient, owning a mobile phone (column 2) is deemed statistically significant at a 5% level. This implies that having a mobile phone is significantly and favorably correlated with the likelihood that a family will borrow money to start or grow a family company by 0.172. For column 3, the use of a call phone is significant at a 5% level, which means that having a cell phone increases the likelihood that a household will borrow money to start or grow a business by 0.105. At a 1% level, the workforce (column 1) coefficient is considered statistically significant which indicates that the workforce of the household is significant and positively correlated with the possibility of the household being able to launch or grow a family business by 0.212 at a 1% level (column 2). The workforce of the household is statistically significant and positively correlated with the chance of the household's ability to launch or grow a family business by 0.273. This means that the likelihood of the household being able to launch or grow a family business is significantly and positively correlated with the workforce of the household by 0.234. Lastly, at the 5% level, the education(cloumn3) coefficient is statistically significant suggesting that the likelihood of the household being able to launch or grow a family business is significantly and adversely correlated with schooling in the household by 0.057.

Marginal Result

It should be observed that the marginal effect result for the instrumental variables (2SLS) regression is identical to or closely connected to the original result of the instrumental variable. Thus, at 1% level, the coefficient, preserved for old age (column 1), is deemed statistically significant suggesting that the likelihood of households saving to start or grow a family company is significantly and positively associated with the respondent's saving for retirement by 0.348. Also, the coefficient, own mobile phone (column 2), is statistically significant at 5% level. This suggests that having a mobile phone is significantly and favorably correlated with the likelihood that a family will borrow money to start or grow a family company by 0.172.

Having a cell phone is significant at the 5% level, (column 3), implying that having a cell phone increases the likelihood that a household will borrow money to start or grow a business by 0.105. similarly, the workforce (column 1) coefficient is significant at the 1% indicating that the workforce of the household is positively correlated with the possibility of the household being able to launch or grow a family business by 0.212 (column 2). This means that the likelihood of the household being able to launch or grow a family business is significantly and positively correlated with the workforce of the household by 0.234. The coefficient of education(cloumn3) coefficient is statistically significant at the 5% level, thus, suggesting that the likelihood of the household being able to launch or grow a family business is significantly and adversely correlated with schooling in the household by 0.057.

Source: Researcher's Compilation, 2021 using Stata 15

Note: *, ** and *** means significance at 10percent, 5 percent and 1 percent, respectively

Instrumental variables (2SLS) regression and its Marginal Effects	Ivegress regression			Marginal effect		
Variable	1	2	3	4	5	6
Use a mobile phone to access a financial account	0.026 (0.602)			0.026 (0.602)		
Safe for old age	0.348** (0.000)			0.348*** (0.000)		
Own mobile phone		0.172*** (0.031)	0.105*** (0.004)			
use debit card		0.073 (0.139)			0.172*** (0.031)	0.105*** (0.004)
Bill payment online			-0.008 (0.897)			-0.008 (0.897)
Income of the household	0.010 (0.812)	0.019 (0.704)	0.046 (0.128)	0.010 (0.812)	0.019 (0.704)	0.046 (0.128)
Workforce	0.212** (0.000)	0.273*** (0.000)	0.234*** (0.000)	0.212*** (0.000)	0.273*** (0.000)	0.234**** (0.000)
Age of the respondents	-0.000 (0.810)	0.001 (0.608)	0.002* (0.056)	-0.000 (0.810)	0.001 (0.608)	0.002* (0.056)
Education	-0.054 (0.562)	-0.167 (0.110)	-0.057 (0.468)	-0.054 (0.562)	-0.167 (0.110)	-0.057 (0.468)
Gender	-0.004 (0.927)	-0.016 (0.745)	-0.017 (0.593)	-0.004 (0.927)	-0.016 (0.745)	-0.017 (0.593)
Pseudo R^2	0.1013	0.0582	0.0656			
X^2	0.0000	0.0003	0.0000			

Discussion of Results

This study main objective was to conduct an empirical examination of the relationship between financial literacy, information and communication technology, and the degree to which these factors affected Nigerian households' ability to do business. The study was able to illustrate how financial literacy and information and communication technologies have affected Nigerian household enterprises based on empirical investigation. The descriptive analysis outlined the degree to which home enterprises and financial literacy, an independent variable, were adopted in Nigeria, a dependent variable, respectively.

The study found that just 37% of Nigerian firms are home enterprises, which makes a small contribution to the country's GDP. The gross domestic product of the country and the level of living in Nigeria might both significantly improve with more involvement in this area. The descriptive analysis also indicated how widely used information and communication technologies are in Nigeria and the amount of financial literacy there is. Indicators of financial literacy revealed that 14% of households saved for retirement, and 31% of households used debit cards5.9% of the households surveyed use the Internet to pay their bills online. As a result, it can be said that, as compared to the rest of the globe, Nigeria has a comparatively low adoption rate for financial literacy in household businesses.

In Nigeria, 21% of households surveyed reported having a mobile phone for accessing financial accounts. A cell phone for commercial use was accessible to 77% of the household. In light of this, we may conclude that, in comparison to the rest of the globe, Nigeria experienced comparatively little impact from the Internet and communication technology. The other variable includes the household characteristics, which include the age of the respondent, gender, and education. And welfare character tics such as the income of the household and the labor force. Of which are relatively low when compared to the rest of the world.This finding leads to the conclusion that the influence of Internet and communication technologies on home enterprises in Nigeria would improve as more of these various financial literacy initiatives are adopted which satisfied the apriori expectation. It is also in line with the study of Ogundana et al. (2017)

Additionally, the effect analysis between the dependent and independent variables was performed using the logit regression model and its instrumental variables (2SLS regression). The ability of the family to start or expand a family business is substantial and positively connected across several characteristics, including owning a mobile phone, saving for retirement, having a job, and respondent age. A negative association exists for education, though. which was in line with the empirical review of Oluwatayo (2014). The viability of the dependent and independent variables was employed in the regression for instrumental variables (2SLS). It analyzes various variables to determine how likely it is for the family to start or expand a family business. Therefore, several indicators showed a positive link, such as possessing a mobile phone, saving money for retirement, the age of the respondent, and the workforce. except for education, which has a negative association.

Lastly, according to the study's findings, only 36% of businesses in Nigeria are household businesses, leaving this market unexplored. The results of this study show that using the Internet and other communication technology as well as financial literacy improves Nigerian households' ability to do business. This suggests that diverse businesses should use various financial and Internet methods to increase their capability both now and in the future. This is supported by a high likelihood that the household will be able to start or expand a family business. By making internet and communication technologies and financial literacy more necessary for family businesses, it boosts production for both the economy and the household respondent. and also improve the standard of living.

Conclusion

The study investigated the link among financial literacy, ICT adoption and Household enterprises using the Global Findex 2021 database. The empirical technique used for the study is the Logit regression and the instrumental variable two-stage least-squares regression, as well as their marginal effect on household enterprises. The findings from the study indicates that ICT adoption has a positive and significant effect on household enterprises. Similarly financial literacy was found to have a significant effect, while the workforce and education had marginal effect on household enterprises. Income and gender were found to not have any significant effect on household enterprises from the Logit regression. Findings from the two stage least square regression indicates that financial literacy and ICT adoption (Savings for old age, owning a mobile phone, use debit card) have positive and significant effect on household enterprises.

Also, age of the respondents and the workforce was found to have significant effect on household enterprises while income of the household, education level and gender has no significant effect on household enterprises. Therefore, financial literacy initiatives such as inclusion into the school curriculum, community-based workshop and training can be put in place by the government in order to enjoy the benefits of a booming household enterprise in an economy. Also, collaborations with financial institutions should be prioritized in order to provide financial education and resources to household enterprises. Finally, government should invest in ICT infrastructure such as improving internet access, promoting mobile payment systems and providing digital literacy for entrepreneurs.

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