Financial Inclusion and Household Entrepreneurship: Micro-level Evidence from Ethiopia

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Abstract

This study investigates the influence of financial inclusion on household-level entrepreneurship in Ethiopia, utilizing nationally representative data from the 2018/19 Ethiopian Socioeconomic Survey. Entrepreneurship is defined by ownership of trading businesses, non-agricultural enterprises, professional offices, and bars/restaurants. Financial inclusion is assessed through a composite index encompassing bank account ownership, formal savings, formal insurance, and formal borrowing. Conventional index construction methods, including Multiple Correspondence Analysis (MCA) and Principal Component Analysis (PCA), demonstrated poor discriminatory power, leading to the adoption of a logical OR function. This function classifies households as financially included if they utilize at least one formal financial service. A multivariate probit (MVProbit) model is employed to account for the simultaneous nature of entrepreneurial decisions across sectors, while an instrumental variable probit (IV-Probit) model serves as a robustness check, confirming that endogeneity concerns are minimal. The results indicate that both formal financial inclusion and participation in informal community-based insurance (IDDIR) significantly enhance the likelihood of entrepreneurship. Additionally, household size, urban residence, and asset ownership are positively associated with business ownership, while older age and rural residence have a negative impact. The study underscores the importance of promoting both formal financial services and community-based risk-sharing mechanisms to foster entrepreneurial activity. Policy recommendations include expanding access to formal finance, strengthening informal networks such as IDDIR, and targeting support to rural households to stimulate business creation and

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sustainable economic development. These findings provide the first country-specific, demand-side evidence linking financial inclusion and informal insurance to household entrepreneurship in Ethiopia.

Keywords: Financial inclusion, Entrepreneurship, *IDDIR*, MVProbit, IV-Probit, Ethiopia
JEL Classification: G21, O16, L26, D14

1. Introduction

Research on the relationship between financial inclusion and entrepreneurship is crucial, especially in developing countries such as Ethiopia. Financial inclusion has become a major policy issue since its addition to the G20 agenda in 2010. It has been acknowledged as a potential tool to address poverty, inequality, and underdevelopment in the world economy (Beck et al., 2007; Demirgüç-Kunt & Levine, 2009). In low-income economies, financial inclusion has been recognized as a major contributor to economic development, poverty reduction, and gender equality (Irankunda & Van Bergeijk, 2020; Ozili, 2020; UN, 2030). Empirical findings have confirmed the positive impact of financial inclusion on entrepreneurship development and the economy as a whole (Jones, 2008; Le et al., 2019).

Financial inclusion enhances entrepreneurship development through access to capital, financial literacy, and business management skills (Abor et al., 2018). The expansion of financial services helps disadvantaged people access financial services, such as credit, which are crucial in the development of new businesses (Bianchi, 2010; Fan & Zhang, 2017). Other authors have noted that access to financial services is a critical factor in influencing entrepreneurship, and the lack of access is a significant hindrance to entrepreneurship development in developing countries (Baliamoune-Lutz et al., 2011; OECD, 2016). The success of new businesses depends on access to and use of financial services (Alemu & Adesina, 2017; Beck et al., 2007; Beck & Demirgüç-Kunt, 2006; Munemo, 2018).

Entrepreneurship has received worldwide recognition as a means of creating jobs and fostering economic growth, especially in economies with high youth and female unemployment rates (Amuna et al., 2019). Nevertheless, entrepreneurship in Sub-Saharan Africa is hindered by challenges such as limited access to finance. This is

particularly true for micro, small, and medium-sized enterprises that face difficulties in accessing finance. This has been cited as a major challenge to the creation of new businesses and the expansion of existing ones (Beck & Demirgüç-Kunt, 2006; Herrington et al., 2010). For instance, only 2% of new SMEs access formal finance in the form of bank loans in South Africa. Financial support and education have been cited as major challenges for SMEs in South Africa (FinMark Trust, 2006).

Entrepreneurship is important for the innovation of technology and the development of the economy through the creation of new products, services, and market conditions that are more productive, knowledgeable, and economically viable in the long term (Acs et al., 2013; P. Ozili, 2025; Rahmawati, 2025). There is an increased interest in the study of the relationship between financial inclusion and entrepreneurship, although the literature on the direct relationship between the two is limited compared to the extensive literature on the relationship between financial inclusion and economic development (Ha et al., 2025; P. Ozili, 2025). The theoretical basis for the relationship between finance and entrepreneurship is founded on classical theories of innovation and economic development (Schumpeter, 1934), which emphasize the importance of access to finance in the innovation process.

Recent empirical findings confirm that higher financial inclusion (in terms of simple financial services, access to credit, and digital finance) is linked to the emergence of new businesses and entrepreneurial intent, although the results depend on the context. However, there are still some gaps in the literature, and it is necessary to conduct more detailed micro-level research on the causal links between financial inclusion and entrepreneurial outcomes (Charfeddine & Zaouali, 2022; P. Ozili, 2025).

There has been limited research conducted on the impact of financial inclusion on the development of entrepreneurship at the household level in developing countries, especially in Sub-Saharan Africa (Blattman et al., 2014; Cho & Honorati, 2013; Fan & Zhang, 2017; A. C. Lyons et al., 2022). This is due to the lack of sufficient data on the financial behavior of individuals. There is also limited research on financial inclusion and women's economic empowerment in Ethiopia (Adera & Abdisa, 2023). This paper, therefore, seeks to empirically examine the relationship between financial inclusion and entrepreneurship among households in Ethiopia, considering urban and rural areas as well as the formal and informal financial systems. Additionally, this study seeks to examine the determinants of entrepreneurship in Ethiopia, thus addressing a critical void in the existing literature.

The rest of the paper is organized as follows. Section 2 provides theory and relevant literature. Section 3 presents the conceptual framework and hypothesis, followed by Section 4, which describes methods and materials. Section 5 details results and discussions. Section 6 provides robustness test results, and Section 7 presents conclusions and policy implications. The final section discusses the limitations of the study and suggestions for future research directions.

2. Theory and Relevant Literature

2.1. Theoretical Framework

There are various theories that can be employed in understanding the relationship between financial inclusion and entrepreneurship. According to Schumpeter's theory of economic development (Schumpeter, 1934), entrepreneurs contribute to economic development through innovations, new products, and the creation of new opportunities. In order for entrepreneurs to contribute to economic development, financial inclusion is essential in facilitating entrepreneurial activities, which enable households to realize their ideas in fully functioning ventures. On the other hand, the theory of financial constraint argues that the lack of access to credit, savings, and insurance is a major challenge in entrepreneurship development, especially in developing countries (Ayyagari & Maksimovic, 2007; Beck & Demirguc-Kunt, 2006). Financial inclusion can, therefore, help in solving these challenges, thus facilitating entrepreneurial activities. In addition, the resource-based theory (Barney, 2000) suggests that the ability of a household to access valuable, rare, and unique resources, such as financial capital and *IDDIR*, is essential in the creation of new ventures. In other words, the various theories suggest that households with access to financial services and *IDDIR* are in a position to engage in entrepreneurial activities.

2.2. Global Evidence

The empirical findings suggest that financial inclusion has a positive effect on entrepreneurship in general; however, there are some variations in the context. In the case of China, Fan and Zhang (2017) reported that financial inclusion has a positive effect on entrepreneurship, particularly in industries where the barriers to entry are low. Contrary to this finding, Matindike and Mago (2022) reported that, in the case of South Africa, financial inclusion is high; however, the level of entrepreneurial activities is relatively low. This shows the moderating role of institutions on the effect of financial inclusion on entrepreneurship. In the case of India and Pakistan,

the findings suggest that the use of formal financial services has a positive effect on entrepreneurial activities for micro-entrepreneurs. However, the impact of microfinance initiatives on entrepreneurial growth is less due to structural and risk-related constraints (Goel & Madan, 2019; Meager et al., 2003).

2.3. African and Ethiopian Evidence

Empirical findings from Africa have consistently demonstrated the significant contribution of financial inclusion to entrepreneurship development among households. For instance, using panel data from African countries, Ajide (2020) established that an increase in financial inclusion significantly contributes to entrepreneurship development among the population, especially women and low-income groups. In addition, other cross-country findings have shown that access to formal financial services, such as bank accounts, savings, and credit, contributes to entrepreneurship development and self-employment through capital accumulation and risk management (Fareed et al., 2017; Goel & Madan, 2019). In this regard, microeconomic findings from Sub-Saharan Africa have shown that financial inclusion contributes to entrepreneurship development among the population, especially those who have previously been financially excluded from accessing credit services (Beck et al., 2007; Demirgüç-Kunt et al., 2018).

In Ethiopia, for example, access to financial services is still very low, especially in rural areas, because of a lack of infrastructure, financial literacy, and institutional mistrust. However, the development of mobile financial services is helping to overcome these challenges. In a study based on a household survey in Ethiopia, Hussen and Mohamed (2023) show that financial inclusion is strongly linked to improvements in household welfare, including consumption and income stability, and hence to the ability of households to engage in economic activities. In conclusion, the studies from Africa and Ethiopia show that financial inclusion is a key channel for improving household welfare and enhancing entrepreneurship.

2.4. Household and Contextual Moderators

Household and individual factors affect financial inclusion and *IDDIR's* participation in different ways. For example, gender is an important factor because men have many opportunities to access resources and tend to take less risk compared to women, who face socio-cultural and institutional barriers (I. E. Allen et al., 2007; D'Espallier et al., 2011; Elder & Kring, 2016; Fletschner, 2008; Kairiza et al., 2017; Malapit, 2012; Minniti & Nardone, 2007; Muravyev et al., 2009; Verheul et al., 2012; Wagner,

2007). In addition to gender, age affects the decisions of entrepreneurs because younger people act based on necessity driven by technology skills, unlike older individuals who have wealth as an incentive for starting businesses (Bernat et al., 2017; Bönte et al., 2009; Caliendo et al., 2014; Llisterri et al., 2006; Van Der Zwan et al., 2012).

Education has also been identified as playing a crucial role in improving opportunities for recognition, financial knowledge, and management, which contribute to financial inclusion and entrepreneurship (Ahmad et al., 2020; I. E. Allen et al., 2007; Fungáčová & Weill, 2015; McKenzie & Woodruff, 2017; Simoes et al., 2016). Having wealth offers households financial capital to undertake or enlarge their enterprises (Bernat et al., 2017). Household locations in urban and rural areas also play a crucial role in determining financial inclusion and entrepreneurship, with households in rural locations depending more heavily on informal means, such as *IDDIR* (A. Lyons et al., 2017; Sykes et al., 2016). All these factors interact to influence the moderating effects between financial inclusion, *IDDIR*, and entrepreneurship.

3. Conceptual Framework & Hypothesis

The current study is grounded on the premise that financial inclusion acts as a catalyst for household entrepreneurship by helping to alleviate liquidity constraints for investments as well as conducting businesses (Beck et al., 2007; Demirgüç-Kunt et al., 2018). The current study defines financial inclusion as the utilization of financial services such as bank accounts, savings, borrowing, and insurance. This definition captures the ability of households to manage financial resources. On the other hand, household entrepreneurship is defined as ownership of trading businesses, non-farm enterprises, professional offices, and service-oriented businesses (Chliova et al., 2015; McKenzie & Woodruff, 2013; Minniti, 2008; Nagler & Naudé, 2017).

Apart from financial inclusion, entrepreneurship is influenced by socio-demographic factors (age, gender, household size, marital status, religion, education level) (Aidis et al., 2008; Ayinaddis, 2023), economic/financial factors (assets, financial literacy, financial capability, financial shocks, mobile financial services) (Klapper et al., 2016; Lusardi & Mitchell, 2014; Suri & Jack, 2016), and institutional/contextual factors (distance to financial institutions, residence in rural/urban areas, participation in informal finance) (F. Allen et al., 2012; Beck et al., 2008). In the Ethiopian setting, an informal community-based risk-sharing scheme called IDDIR provides risk-

sharing, smoothing, and protection, in conjunction with financial inclusion, to promote entrepreneurship (Alemayehu, 2024; Aredo, 2010; Dercon et al., 2005). In summary, household entrepreneurship is a function of financial inclusion, IDDIR, and socio-demographic, economic, and institutional factors.

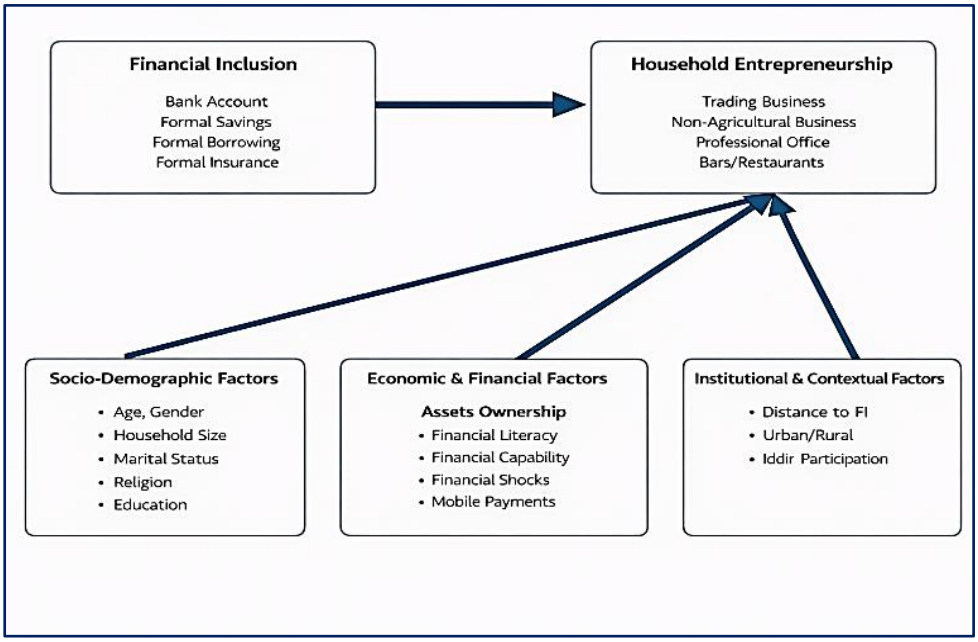

Figure 1: Conceptual Model (Adera & Abdisa, 2023)

Hypothesis Development

The conceptual framework in Figure 1 shows the various ways in which financial inclusion and other socio-economic, financial, and institutional factors influence household entrepreneurship. Specifically, financial inclusion, through bank accounts, savings, borrowing, and insurance, is expected to enhance entrepreneurial activities. However, household entrepreneurship is also influenced by socio-demographic factors (age, gender, household size, marital status, religion, education); economic and financial factors (asset ownership, financial literacy, capability, financial shocks, mobile money); and institutional/contextual factors (distance to financial institutions, urban or rural residence, *IDDIR* participation). These are the hypotheses that guide this study.

H1: Financial inclusion has a positive and significant influence on household entrepreneurship. (Beck et al., 2007; Demirgüç-Kunt et al., 2018)

H2: Socio-demographic factors such as age, gender, household size, and education level impact household entrepreneurship. (Aidis et al., 2008; Ayinaddis, 2023),

H3: Economic and financial factors such as asset ownership, financial literacy, financial shocks, and mobile payments impact household entrepreneurship (Klapper et al., 2016; Lusardi & Mitchell, 2014; Suri & Jack, 2016),

H4: Institutional and contextual factors such as living in urban or rural areas, distance from financial institutions, and *IDDIR* participation impact household entrepreneurship (Alemayehu, 2024; Aredo, 2010; Dercon et al., 2005).

4. Methods and Materials

4.1. Data Sources and Sample Selection

The current study employs the information provided by the FIM survey carried out by the Central Statistics Agency of Ethiopia, the World Bank, and the National Bank of Ethiopia for the 2018/2019 survey. This survey is part of the Socioeconomic Survey (ESS), collecting details regarding account ownership, banking practices, and knowledge of various financial products, aimed at informing the implementation of the country's National Financial Inclusion Strategy. The source survey contains information from 6,700 nationally representative households in rural, urban, and regional zones. After addressing missing information by using mean substitution for continuous data and mode substitution for categorical data, followed by the removal of households that presented high levels of incomplete and inconsistent information, the study sampled 4,498 households (Afkanpour et al., 2025; Radosavljević et al., 2025) that are nationally representative.

4.2. Description of Variables & Summary Statistics

Table 1 and Table 2 present list of variables, definitions and corresponding descriptive statistics.

Table 1: Description of Variables

S. No.	Variables Lists	Category	Measurement
1	Own Trading Business	Dependent	= 1 if the household own trading business; = 0 if otherwise
	Own Non- Agricultural Business	Dependent	= 1 if the household own Non-Agricultural business; = 0 if otherwise
	Own Professional Offices	Dependent	= 1 if the household own Professional Offices; = 0 if otherwise
	Own Bar or Restaurant	Dependent	= 1 if the household own Bar or Restaurant; = 0 if otherwise
2	Financial Inclusion Index FI_Index)	Independent	Constructed using Logical OR function in stata 15 software : Coded as 1 if the household responded "Yes" (1) to any one of the following four indicators and 0 if all are "No" 1. Bank Account Ownership (1= Yes, 0= No) 2. Formal Savings (1= Yes , 0 = No) 3. Formal Borrowings (1= Yes , 0 = No) 4. Formal Insurance (1= Yes , 0 = No)
	Mobile phone Payment	Control	=1 if the household uses mobile phone to pay bills; =no if otherwise
4	Financial Literacy	Control	=1 if the household knows how to open a bank account; =0 if otherwise
5	Urban/Rural	Control	=1 if the household lives in Rural location; =0 if the household lives in Urban location
6	Household Size	Control	Number of individuals living in the household
7	Gender	Control	=1 if the individual in the household head is male; =0 if female
8	Marital status	Control	=1 if the household head is married; =0 if otherwise (single, divorced, widowed, separated)
9	Age	Control	The age of the household head between 17 to 99
10	Education	Control	=1 if the household has attended any school; =0 if otherwise (no schooling at all)
11	Distance to the nearest Financial Institutions	Control	The number of kilometers covered
12	Asset Ownership	Control	=1 if the household head owns a financial asset; = 0 if otherwise
13	Financial Capability	Control	=1 if the household try to borrow & was turned down in the last 12 months =0 if otherwise
14	*IDDIR* (Informal Insurance)	Control	=1 if the household head is a member of *IDDIR;* =0 if otherwise
15	Financial Shocks	Control	1 if the household head is worried about covering unexpected expenses =0 if otherwise

Table 2: Summary Statistics

Variables	Obs.	Mean	Std. Dev.	Min	Max
FI_Index*	4498	.607	.489	0	1
Own Trading Business	4498	.051	.22	0	1
Own Non-Agricultural Business	4498	.146	.353	0	1
Own Professional Services	4498	.011	.104	0	1
Own Bar or Restaurant	4498	.012	.11	0	1
Mobile Phone Payment	4498	.109	.312	0	1
Log Household Size	4498	1.266	.615	0	2.944
Log Distance to the FI	4421	1.09	1.805	-4.605	8.7
Marital Status	4498	.688	.464	0	1
Financial Literacy	4498	.691	.462	0	1
Asset Ownership	4498	.068	.252	0	1
Gender	4498	.713	.453	0	1
Urban –Rural Area	4498	.295	.456	0	1
IDDIR(Informal Insurance)	4498	.442	.497	0	1
Age	4498	40.331	14.15	17	99
Religion	4498	.659	.474	0	1
Education	4498	.703	.457	0	1
Financial Shock	4498	.556	.497	0	1
Financial Capability	4498	.414	.493	0	1

Source: Authors' Computation (Ethiopian Scio-economic Survey 2018/2019)

NB.: *Figures are rounded to three decimal places in all tables, and the results shall be understood with this caveat in mind*

Table 2 reveals information regarding financial inclusion, entrepreneurship, and socioeconomic characteristics of such households. The financial inclusion of the population stands at 61%, while entrepreneurship levels are very low, with only 5.1% running trading businesses, 14.6% running non-farm businesses, and only 1% running professional services, bars, and restaurants. In addition, mobile payment adoption is very low, at only 11%, though financial literacy is high, at 69.1%. Most of the households in rural areas are married, have an average household size of four members, and only 6.8% own financial assets. More than half, i.e., 55.6%, of these households face financial shocks. Rural and urban populations, i.e., 29.5% and 70.5%, respectively, indicate where these households live. This information suggests that although financial inclusion is moderate, entrepreneurial development is very slow.

4.2.1. Dependent variable

Entrepreneurship is the dependent variable in this study, defined as self-employment, which includes owning or co-owning a micro or small/medium enterprise (Fareed et al., 2017). The ESS4 dataset includes yes/no questions asking households whether they owned a trading business, a non-agricultural business, a professional office, or a bar/restaurant in the past 12 months. Entrepreneurship is represented as a binary variable, coded as 1 if the household owns any of these businesses and 0 otherwise.

4.2.2. Independent variable

For financial inclusion, which is the main explanatory variable, four binary measures were used: namely, bank account ownership, savings, borrowing, and insurance (Adera & Abdisa, 2023; Asuming et al., 2019; Irankunda D. & Van Bergeijk, 2020). Even though PCA was found to be inappropriate due to its assumptions of continuous and normal distributions of data (Jolliffe & Cadima, 2016; Linting & Van Der Kooij, 2012), and MCA and the sum index were found to have no impact on household entrepreneurship (Abdi & Valentin, 2007), the logical OR method in STATA—where a household was considered financially included if it had access to at least one financial service—was found to be effective in analyzing household entrepreneurship, in line with the definition of financial inclusion in the Global Findex database, covering its scope comprehensively (Demirguc-Kunt et al., 2018).

4.2.3. Control variables

The socio-demographic factors considered are age, gender, education level, marital status, household size, and religion, as specified by Fareed et al. (2017). The study also considers economic factors such as asset ownership, income received from the municipality, financial literacy, financial capability, financial shocks, and mobile money. The institutional factors are distance from financial institutions, urban or rural areas, and IDDIR. The factors that are not considered are entrepreneurial risk perception and psychological factors, which are considered important factors for entrepreneurship by the OECD (2016).

4.3. Econometric Model

We used a multivariate probit model to examine the effect of financial inclusion and other demographic and socio-economic variables on household-level entrepreneurship. The model was chosen because our four outcome variables are dichotomous or binary.

$Y_i* = \beta_i$ FI_Index + $\gamma_i X + \epsilon_i$ for each outcome $_i \in$ (Own Trading Business, Own Non-Agricultural Business, Own Professional Offices, Own Bar or Restaurant} **(1)**

Where, Y_i***,** the latent variable for each of the outcomes: *Own Trading business* (1 if Yes, 0 if No). *Own Non – Agricultural Business* (1 if Yes, 0 if No). *Own Professional Offices* (1 if Yes, 0 if No). *Own Bar or Restaurant* (1 if Yes, 0 if No). *FI_Index* (financial inclusion index) represents four financial inclusion indicators. β_i is the coefficients for the financial inclusion index for each outcome. γ_i is the coefficients for the control variables **X** (demographic and socioeconomic characteristics). ϵ_i is the error term for each outcome, assumed to follow a multivariate normal distribution with covariance matrix Σ which captures the correlations between the error terms across the four outcomes. The model is estimated using the multivariate probit command in stata 15 statistical software.

4.4. Model Diagnostic Tests

VIF results indicate that multicollinearity is not a serious concern in the model. Except for age and its square, all variables have VIF values well below 10, with key regressors such as financial inclusion, *IDDIR* participation, financial capability, gender, education, and household characteristics showing low VIFs (1–2). The high VIFs for age and age square are expected due to their mechanical correlation and reflect intentional modeling of nonlinear age effects rather than a specification problem. The mean VIF of 5.20 further confirms that overall multicollinearity is not problematic.

Table 3: Multicollinearity Diagnostics using Variance Inflation Factor (VIF)

Variable	VIF	1/VIF
Age	32.66	0.031
Age squared	30.92	0.032
Urban/ RuraL	1.74	0.576
Log household size	1.72	0.582
Financial literacy	1.67	0.598
Marital status	1.65	0.605
Log Distance to FI	1.65	0.605
Education	1.54	0.649
FI_index	1.45	0.690

Variable	VIF	1/VIF
Gender	1.44	0.695
Financial Literacy	1.29	0.776
Religion	1.21	0.830
IDDIR	1.19	0.842
Financial shock	1.05	0.955
Asset Ownership	1.04	0.963
Mobile payment	1.02	0.984
Mean VIF	5.20	

5. Results and Discussions

Table 4: Multivariate Probit Estimates for Entrepreneurship Outcomes

Variables	(1) Owning Trading Business	(2) Owning Non-Agricultural Business	(3) Owning professional Offices	(4) Owning Bar or Restaurant
FI_index	0.184** (0.082)	0.149** (0.060)	0.384** (0.176)	0.295* (0.161)
Mobile Payment	-0.114 (0.110)	-0.106 (0.079)	-0.184 (0.198)	-0.089 (0.182)
log Household Size	0.136* (0.071)	0.272*** (0.051)	-0.015 (0.122)	0.323*** (0.121)
log Distance to FI	0.012 (0.022)	-0.069*** (0.017)	-0.071 (0.043)	0.012 (0.039)
Marital Status	-0.061 (0.08)	-0.025 (0.066)	-0.021 (0.161)	-0.068 (0.148)
Financial Literacy	-0.022 (0.090)	-0.015 (0.067)	0.110 (0.193)	0.253 (0.183)
Asset Ownership	0.122 (0.120)	0.255*** (0.088)	0.232 (0.175)	0.333* (0.171)
Gender	0.0981 (0.087)	0.062 (0.064)	0.165 (0.161)	-0.217 (0.142)
IDDIR	0.188*** (0.071)	0.113** (0.052)	0.016 (0.127)	-0.244** (0.124)
Age	0.005 (0.015)	-0.000 (0.010)	4.82e-05 (0.024)	-0.008 (0.021)
Age Squared	-0.000 (0.000)	-3.21e-05 (0.000)	1.92e-05 (0.000)	0.000 (0.000)
Religion	-0.145** (0.073)	-0.083 (0.054)	0.163 (0.145)	0.263* (0.144)
Education	-0.062 (0.087)	0.047 (0.065)	0.015 (0.175)	0.09 (0.165)
Financial Shock	0.121* (0.067)	-0.03 (0.049)	0.025 (0.116)	-0.160 (0.112)
Financial Capability	0.000 (0.074)	0.091* (0.054)	0.122 (0.130)	0.155 (0.127)
Urban/Rural	-0.432*** (0.097)	-0.312*** (0.072)	-0.149 (0.192)	-0.212 (0.176)
Constant	-1.828*** (0.314)	-1.372*** (0.220)	-2.932*** (0.545)	-3.051*** (0.512)
Observations	4,421	4,421	4,421	4,421

(5)	(6)	(7)	(8)	(9)	(10)
atrho21	atrho31	atrho41	atrho32	atrho42	atrho43
-0.0284	0.046	0.178**	-0.059	-0.173**	0.084
(0.0380)	(0.082)	(0.081)	(0.073)	(0.078)	(0.105)
4,421	4,421	4,421	4,421	4,421	4,421

Standard errors in parentheses ; *** p<0.01, ** p<0.05, * p<0.1

As evidenced in Table 4, financial inclusion exerts a strong positive effect on the probability of entrepreneurship engagement for all four types of businesses, while the use of mobile payments has no significant effect on entrepreneurship engagement for any of the four business types. Household size and asset ownership are positively associated with non-agricultural and bar/restaurant business engagement, while the distance to financial institutions decreases the probability of non-agricultural business ownership. *IDDIR* participation exerts a strong positive effect on the probability of trading and non-agricultural business ownership, while it decreases the probability of bar/restaurant business ownership. The negative rural coefficient implies that rural households have weaker latent probabilities of business ownership than urban households, and this location effect is statistically significant at the 1% significance level for the first two business types, but not significant for the last two. Lastly, the athrho correlations are all statistically significant, thus confirming the interdependence of the four business types and justifying the choice of the MVProbit model over individual probit models.

Table 5: Average Marginal Effects of Financial Inclusion on Household Level Entrepreneurship

Variable	dy/dx	Delta Method Std. Err.	P>z
FI_index	0.184	0.081	0.024
Mobile Payment	-0.114	0.110	0.300
Log HH Size	0.136	0.071	0.056
Log Distance to FI	0.012	0.022	0.601
Marital Status	-0.061	0.090	0.499
Financial Literacy	-0.022	0.090	0.803
Asset Ownership	0.122	0.120	0.311
Gender	0.098	0.087	0.259
IDDIR	0.188	0.071	0.008
Age	0.005	0.015	0.734
Age Squared	-0.000	0.000	0.374
Religion	-0.145	0.073	0.047
Education	-0.062	0.087	0.477
Financial Shock	0.121	0.067	0.073
Financial Capab.	0.000	0.074	0.997
Urban/Rural	-0.432	0.097	0.000

From the results in Table 5, it is evident that the coefficients demonstrate that financial inclusion has a statistically significant positive effect on household entrepreneurship in Ethiopia, raising the probability of entrepreneurship by 18.4 percentage points, ceteris paribus. This is consistent with prior works conducted on the same topic (Ajide, 2020; Fan & Zhang, 2017; Fareed et al., 2017; Goel & Madan, 2019; Neumark et al., 2011). In addition, membership in *IDDIR* possesses a strong positive association, whereas household size and age have weak positive effects on household entrepreneurship in Ethiopia. Furthermore, households located in rural areas have about a 43 percent lower probability of engaging in entrepreneurship than those located in urban areas, thus illustrating the urban-rural gaps observed in the country.

6. Robustness Tests Results

6.1. Robustness Test Results for Model Validation of MV Probit

This can be explained by the fact that the reproducibility and reliability of the results are borne out by several tests. For instance, the significance of the model and the significance of the joint explanatory variables are supported by the Wald chi-square statistic, where the significance level is clearly very low ($\chi^2 = 267.16$, $p = 0.0000$). In addition, the significance of the correlations among the error terms is supported by the Likelihood Ratio Test, where the level is again very low ($\chi^2(6)= 24.8766$, $p = 0.0004$), supporting the substantial interdependence among the error terms. Moreover, the estimated correlations, $\rho41$ (0.299) and $\rho43$ (0.198), are statistically significant at the 1% and 5%, respectively, thus supporting the significant relationship between the pairs of equations. Finally, the log-likelihood level is quite satisfactory at -3126.0747, thus supporting the reliability of the model.

6.2. IV-Probit Robustness Checks Results

To address the potential endogeneity of financial inclusion, IV-Probit models were estimated for all the outcomes using log distance to the nearest bank as an instrument. Distance to the nearest financial institution is a valid instrument for financial inclusion adoption since it is correlated with the adoption of financial inclusion, given the higher cost of access (Churchill & Marisetty, 2020; Nguyen et al., 2021), but is not correlated with the decision to start a business at the household level, apart from the financial inclusion adoption channel (Koomson & Danquah, 2021). As shown in Table 6, the findings are similar to the main results using the MVProbit

model. FI_index is positively significant for owning non-agricultural businesses and owning professional offices, which further validates the robustness of the positive effect of financial inclusion on owning non-agricultural entrepreneurship. However, the effect on owning trading businesses and owning bars or restaurants is negative but significant in some cases.

Table 6: IV-Probit Estimates for the Influences of Financial Inclusion (FI_Index) on Household Level Entrepreneurship Outcomes.

Variables	Own Trading Businesses (β, Robust SE)	Own non-Agricultural businesses (β, Robust SE)	Own Professional Offices (β, Robust SE)	Own Bar or Restaurant (β, Robust SE)
FI_index	-2.361***(0.685)	2.466*** (0.022)	2.475*** (0.049)	-2.334* (0.956)
Mobile Payment	0.154 (0.149)	-0.188***(0.046)	-0.191***(0.053)	0.159 (0.155)
Log Household size	-0.031 (0.146)	0.074 (0.052)	0.063* (0.032)	0.009 (0.371)
Marital Status	-0.030 (0.070)	0.015 (0.041)	0.016 (0.041)	-0.031 (0.090)
Financial Literacy	0.709*** (0.188)	-0.732***(0.050)	-0.727***(0.058)	0.770***(0.105)
Asset Ownership	0.217* (0.096)	-0.184** (0.067)	-0.185** (0.065)	0.262 (0.317)
Gender	0.113 (0.081)	-0.092* (0.040)	-0.088* (0.047)	0.042 (0.272)
IDDIR	0.157 (0.151)	-0.114** (0.039)	-0.117***(0.034)	0.062 (0.302)
Age	0.010 (0.007)	-0.009 (0.006)	-0.009 (0.006)	0.007 (0.013)
Age Squared	-0.000 (0.000)	0.000*(0.000)	0.000*(0.000)	-0.000 (0.000)
Religion	0.182 (0.187)	-0.223***(0.037)	-0.214***(0.046)	0.271 (0.228)
Financial Shock	0.096 (0.104)	-0.072* (0.031)	-0.070* (0.031)	0.032 (0.204)
Financial Capability	0.839*** (0.184)	-0.856***(0.041)	-0.854***(0.043)	0.873***(0.061)
Education	0.011 (0.078)	-0.023 (0.045)	-0.024 (0.045)	0.045 (0.104)
Urban/ Rural	0.032 (0.407)	-0.143† (0.080)	-0.136* (0.059)	0.081 (0.245)
_cons	-0.196 (1.715)	-0.264 (0.267)	-0.323 (0.486)	-0.467 (3.406)

Robust Standard error in Parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

The findings in Table 6 show that financial inclusion, measured by FI_index, has a mixed influence on entrepreneurship in the household sector in Ethiopia. It has a significant positive influence on the ownership of non-agricultural enterprises (β = 2.466, $p<0.01$) and professional offices (β = 2.475, $p<0.01$), but a negative impact on involvement in trading enterprises (β = -2.361, $p<0.01$) and bars/restaurants (β = -2.334, $p<0.1$). Mobile payment transactions have a negative impact on the ownership of non-agricultural and professional offices. Financial literacy and capability have a positive and significant impact on trading and bar/restaurant enterprises, but a negative impact on non-agricultural and professional offices. Household size, asset ownership, and *IDDIR* membership have diverse positive and negative impacts on various sectors, some of which are significant in the ownership of professional offices. Other variables, such as gender, age, religion, financial shocks, and education, have smaller or sector-specific influences, emphasizing the diverse impact of financial and socio-demographic variables on various forms of entrepreneurship in the household sector.

7. Conclusions and Policy Implications

7.1. Conclusions

The results of the MV-Probit and IV-Probit models indicate that financial inclusion is a significant yet varied driver of household entrepreneurship in Ethiopia. The MV-Probit findings highlight the overall positive influence of various businesses and related sectors on household entrepreneurship, suggesting diverse household strategies. In contrast, the IV-Probit results show positive impacts of financial inclusion on non-agricultural businesses and professional offices, but negative effects on trading and bar/restaurant businesses. Additionally, the analysis reveals insignificant and negative impacts of mobile payment on entrepreneurship, suggesting that digital finance is primarily used for transactions rather than investments. Informal finance through *IDDIR* demonstrates positive impacts on household entrepreneurship, reflecting its influence on livelihoods and sectoral dynamics in both the MV and IV results. Furthermore, geographic and demographic factors significantly affect household entrepreneurship, underscoring the socially embedded nature of entrepreneurial activities. Diagnostic tests confirm the consistency of the models and indicate no endogeneity issues.

7.2. Policy Implications

The findings suggest that Ethiopia's financial inclusion strategy should extend beyond merely increasing access to formal financial services. It must also prioritize aligning financial services with the specific needs of various household businesses. In this context, the strategy should pay particular attention to non-agricultural and professional enterprises, as financial inclusion has a more significant impact in these sectors. The limited effectiveness of mobile payment services highlights the necessity for the National Digital Payments Strategy to evolve beyond basic transaction services. It should also leverage these services to foster productive activities by integrating them with credit, savings, and investment offerings. Additionally, the ongoing relevance of *IDDIR* underscores the importance of informal financial services, especially for livelihood-oriented businesses where formal financial services have a minimal impact. The disparities in business outcomes further indicate the need for entrepreneurship policies that take into account the differences between rural and urban areas in Ethiopia.

8. Limitations and Future Research Directions

This study has several limitations that future research could address. First, its cross-sectional design makes it difficult to determine causality. Longitudinal research may better capture the evolving dynamics of entrepreneurship. Second, because the research is country-specific, the findings may not be generalizable. Comparative studies across nations could provide valuable insights. Additionally, the study did not investigate the impact of larger institutional factors, such as legislative frameworks and government support, highlighting another avenue for future research.

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Appendix

Table 7: Pair wise Pearson Correlation Matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
(1) FI _Index*	1.000																	
(2) Own Trading Business	0.045	1.000																
(3) Own Non-Agricultural Business	0.076	-0.002	1.000															
(4) Own Professional Offices	0.059	-0.005	-0.001	1.000														
(5) Own Bar or Restaurant	0.051	0.060	-0.010	0.068	1.000													
(6) log Household Size	-0.118	0.020	0.061	-0.019	0.018	1.000												
(7) log Distance to the FI	-0.154	-0.027	-0.115	-0.051	-0.024	0.196	1.000											
(8) Marital Status	0.011	0.011	0.035	0.001	-0.006	0.451	0.105	1.000										
(9) Financial Literacy	0.409	0.030	0.069	0.048	0.042	-0.219	-0.379	-0.005	1.000									
(10) Asset Ownership	0.109	0.019	0.045	0.031	0.036	-0.132	-0.045	-0.057	0.137	1.000								
(11) Gender	0.092	0.017	0.032	0.020	-0.017	0.222	0.089	0.508	0.091	0.020	1.000							
(12) Urban _Rural Area	-0.141	-0.065	-0.107	-0.041	-0.035	0.259	0.585	0.164	-0.383	-0.067	0.153	1.000						
(13) *IDDIR* (Informal Insurance)	0.063	0.033	0.049	0.006	-0.010	0.207	-0.070	0.104	0.032	-0.037	0.060	0.066	1.000					
(14) Age	-0.146	-0.024	-0.005	-0.008	0.018	0.314	0.018	0.002	-0.212	-0.083	0.003	0.068	0.271	1.000				
(15) Religion	0.200	-0.014	0.006	0.035	0.036	-0.191	-0.247	-0.094	0.259	0.057	-0.066	-0.195	0.152	-0.034	1.000			
(16) Financial Shock	0.017	0.032	-0.006	0.003	-0.019	-0.055	-0.066	-0.066	0.046	0.002	-0.064	-0.120	0.048	0.002	0.130	1.000		
(17) Financial Capability	0.437	0.024	0.070	0.047	0.047	-0.054	-0.105	0.028	0.245	0.051	0.094	-0.146	0.009	-0.106	0.074	-0.090	1.000	
(18) Education	0.260	0.018	0.060	0.036	0.027	-0.192	-0.269	0.057	0.472	0.100	0.156	-0.296	-0.010	-0.343	0.240	0.027	0.222	1.000

Source : Authors Computation (Ethiopian Socio-economic Survey 2018/2019)

As shown in Table 7, there exists from weak to moderate positive correlations between the Financial Inclusion Index (FI_Index) and entrepreneurship variables. There is a slight association between FI_Index to owning a Trading Business (0.045) than in the cases of Non-Agricultural Business (0.076), Professional Offices (0.059), and Bar/Restaurant (0.051). FI_Index is negatively correlated with Household Size (-0.118) and Distance to Financial Institutions (-0.154). This suggests that larger households and greater distances to financial institutions are related to lower financial inclusion. Marital Status (0.011), Gender (0.092), and Religion (0.200) show weak positive correlations. To the contrary, Financial Literacy (0.409) and Financial Capability (0.437) have stronger positive links. This shows that higher financial inclusion is associated with better financial literacy and capability. Overall, the correlation matrix shows that financial inclusion index is positively correlated to the four dependent entrepreneurship variables