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## Barriers to Access Formal Financial Services: An Empirical Study from Indonesia

Ari Dwi JAYANTI<sup>1</sup>, Kemala Sari AGUSTI<sup>2</sup>, Yuli SETIYAWATI<sup>3</sup>

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### Abstract

The condition of financial services in Indonesia is unique, based on various characteristics, behaviors, and preferences. Therefore, the study of finance and banking is interesting to study as a recommendation for government policies. This paper aims to analyze the barriers to accessing formal financial services in Indonesia and why informal financial services are preferred. This paper presents a case study of financial inclusion in selected provinces in Indonesia using the SOFIA dataset from the Ministry of National Development Planning. Overall, this data consists of 20,000 individuals from 4 provinces and 93 regions representing the population in eastern Indonesia. The analysis was carried out by processing individual-level cross-sectional data surveyed in 2017 using the probit binary logistic method. The results identify the individual barriers in accessing formal financial services, including account ownership, saving, and credit activities in the formal financial institutions, and amplify the image by analyzing what determinants affect people to choose informal institutions. We found that some individual characteristics such as age, gender, education, income, employment status, residence, and access to technology significantly affect the barrier to formal financial services in East Indonesia.

**Keywords:** Financial Access, Financial Institutions, Non-bank Financial Institutions, Behavioral Finance, Indonesia

**JEL Classification Code:** O16, G20, G23, G40

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### 1. Introduction

Financial inclusion can be defined as a condition where people can access financial institutions easily. According to data from the Global Financial Index in 2017, the financial inclusion rate in Indonesia reached 48.9% or 12% higher than the previous three years of data. However, the low level of access to financial services is also caused by the limited level of banking penetration. So, what is the general understanding of Financial Inclusion?

Financial inclusion is an essential determinant of economic growth and poverty reduction (World Bank, 2018). Financial inclusion can provide significant support for financial stability through an inclusive financial system and increase people's ability to participate in economic activities, so they hope to solve problems and reduce the inequality rate (Pham & Doan, 2020). The research also provides information to financial institutions and governments, which helps them have a financial development strategy to improve the regulatory framework and enhance the system's financial stability. Furthermore, financial inclusion encourages someone to get out of the poverty trap because it allows people to invest in education and entrepreneurship (Zins & Wiell, 2016). According to the study of Chavali et al. (2021), financial behavior impacts financial well-being. For this reason, financial inclusion is expected to be one of the mechanisms for reducing social disparities and improving the welfare of the poor in Indonesia.

Therefore, understanding barriers to access financial services in Indonesia is the main question to support one of the economic development pathways in Indonesia. Therefore, the objective of this paper is to contribute to the understanding of determinant barriers to access financial services in Indonesia.

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<sup>1</sup>First Author. Assistant Professor. Department of Economics, Faculty of Economics and Business, Airlangga University, Indonesia.  
Email: aridwijayanti00@gmail.com

<sup>2</sup>Corresponding Author. Faculty of Economics and Business, Airlangga University, Indonesia [Postal Address: Kp. Lembur Kolot 75, Tenjoayu, Cirurug, Sukabumi, West Java 43359, Indonesia]  
Email: kemala.sari.agusti-2018@feb.unair.ac.id

<sup>3</sup>Assistant Professor. Department of Economics, Faculty of Economics and Business, Airlangga University, Indonesia.  
Email: yuli.setiyawati-2017@feb.unair.ac.id

Our study uses data from the Survey of Financial Inclusion and Access (SOFIA) from the Ministry of National Development Planning. The SOFIA dataset covers 93 districts with 20,000 respondents; this data contains surveys of the adult population (i.e., those aged 17 years and older) from several selected provinces in Indonesia: East Java, NTB, NTT, and South Sulawesi in 2017. This study uses binary logistic regression with the dependent variable on the binary scale and the independent variable with a continuous, binary, discrete, and categorical scale.

First, we explain the general condition of financial inclusion in Indonesia. Second, we analyze how the individual determinants of barriers to access to the formal banking industry, which we define as a formal financial institution, are linked to three main financial inclusion indicators: bank account ownership, savings, and credit. There will be three main questions: Why do not save money in the bank? Why does one not have a bank account? Furthermore, why not get a loan from the bank? Third, we strengthen our conclusions by analyzing the determinants of saving and individual credit in terms of informal financial institutions, which are divided into three types, namely informal, semi-formal, and family institutions.

This paper is organized as follows; section 1 is performed to the introduction, section 2 provides related literature from the previous study, section 3 explains methodology and data, section 4 provides the main result and descriptive statistic of our estimation. In contrast, section 5 is a conclusion with policy recommendations.

## 2. Literature Review

### 2.1. Financial Inclusion

The term financial inclusion became a trend in 2008 based on the impact of the crisis at the bottom of the pyramid or the crisis of low-income communities, workers with illegal documents, marginalized communities who are generally unbanked (Bank Indonesia, 2013). Hannig and Jansen (2010) have defined financial inclusion as a state where all working-age adults have effective access to credit savings, payments, and insurance from formal service providers. In just 6 years, financial access has improved dramatically worldwide.

### 2.2. The Barrier to Access Financial Inclusion

According to the Ministry of Finance of Indonesia (2014), several factors hinder people's access to the formal financial sector. These factors can be grouped into two categories: the demand and the supply sides. From the demand side, people's access is hampered due to a lack of knowledge and public concern for financial services, low income, lack of security, and social inclusion. On the

other hand, several factors often prevent people from accessing the formal financial sector from the supply side. This includes the distance between bank branches and their residences, complicated procedures, mismatching of financial products with needs, language that is not understood, employee behavior, and rigid bank operating times. Meanwhile, according to the study of Rahman et al. (2021), if the barriers to access financial inclusion can be minimized, it can increase bank competition, improving health or financial stability.

Shihadeh et al. (2018), research for 16 countries in the Middle East, North African, Afghanistan, and Pakistan (MENAP) with a probit regression model, shows that education, income, gender, and age are also associated with financial inclusion. Educated people have a high probability of accessing financial services. This is because educated people may have jobs that encourage them to have bank accounts and save and borrow at the bank. In addition, educated people are also willing to deal with the regulations, read, document, and understand financial regulations. Abel et al. (2018), based on data collected from the 2014 FinScope Consumer Survey in Zimbabwe, it is clear that age has a positive relationship with financial inclusion than negative on age squared. This means that the older a person is, their knowledge of financial inclusion increases and encourages them to use it until a certain time, for example, at retirement.

Zins and Weill (2016) found that being richer, well-educated, and older significantly affects financial access. At the same time, the most considerable influence comes from education and income. The data was obtained from the World Bank's Global Findex database on 37 African countries to perform probit estimations. When a person's income increases, financial inclusion also increases. This makes perfect sense because someone who gets a large wage can be accessed through a bank account (Abel et al., 2018). The study obtained by Islam (2015) among the countries of the Asia-Pacific region using financial access survey data of IMF covering the period 2010–2015 explains that financial inclusion is influenced by rural versus urban living at the individual level. Rural people may have obstacles that are "too far" and "too expensive" because most rural people have middle to lower-income and work in the informal sector. Technology has a positive influence on financial inclusion (Abel et al., 2018). Duncombe and Boateng (2009) argue that technological advances make financial distribution easier even though they are remote and provide easier access for women to consume financial products.

### 2.3. Informal Financial Services

Nwuke (1996) stated that informal institutions have an important role in consumption and risk pooling, especially

in rural areas. Therefore, informal financial institutions are significant to understand local-level institutions that have implications for rural communities' saving, lending, and risk pooling decisions (Shipton, 1991).

Zins and Weill (2016) stated that women in Africa use informal financial services more than formal financial services. The education factor positively correlates with the increase in informal financial services and increases the saving rate at the formal institutions. A study conducted by Nwuke (1996) regarding the cross-section of Sub-Saharan African countries on informal financial institutions shows that education is positively correlated with the probability of borrowing in informal financial services, while age is not statistically significant. Nwuke also stated that age was positively significant for lending, but education was not significant.

### 3. Research Methodology

#### 3.1. Data

We use the Survey on Financial Inclusion and Access (SOFIA) from the Ministry of National Development Planning as a source of data analysis. The SOFIA dataset contains adult population surveys (i.e., 17 years and older) from several selected provinces in Indonesia: East Java, NTB, NTT, and South Sulawesi in 2017. Overall, the SOFIA dataset covers 93 districts with total observations of 20,000

respondents and measures financial inclusion formally and informally on an individual scale. The scope of various observations includes driving factors and individual pull factors in financial products and services.

#### 3.2. Estimation Models and Methods

This study uses binary logistic regression with the dependent variable on the binary scale and the independent variable with a continuous, binary, discrete, and categorical scale. Binary logistic regression is divided into two types, namely logit, and probit. These two models are often used to estimate the probability prediction of an independent variable. Qualitatively, the two models produce almost the same output (Vasishlt, 2000). Therefore, to evaluate the access barriers to formal institutions in selected provinces of Indonesia, we perform probit estimations and use the equation:

$$X_i = \alpha + \beta_1 \times \text{Edu}_i + \beta_2 \times \text{Age}_i + \beta_3 \times \text{Age}_i^2 + \beta_4 \times \text{Rural}_i + \beta_5 \times \text{Male}_i + \beta_6 \times \text{Income}_i + \beta_7 \times \text{Tech\_high}_i + \beta_8 \times \text{Self\_employ}_i + \varepsilon_i$$

Where  $X$  is the dependent variable representing the financial inclusion variable, and  $i$  represents the individual to  $i$ . The overall list of variables used in this paper for estimation is described in Table 1. The research framework of this study is illustrated in Figure 1.

**Table 1:** Variable Description

No	Dependent Variables	Descriptions
<b>Why does one not have a Bank Account?</b>		
1	noacc_nomoney	1 for individuals who do not have a bank account because they do not have money or regular income; 0 otherwise
2	noacc_notknow	1 for individuals who do not have a bank account because they cannot read or do not know the bank system; 0 otherwise
3	noacc_lackdoc	1 for individuals who do not have a bank account because they do not have complete documents or do not meet the requirements for opening a bank account; 0 otherwise
4	noacc_cash	1 for individuals who do not have a bank account because they do not need a bank account or prefer cash; 0 otherwise
5	noacc_far	1 for individuals who do not have a bank account because the banking location is remote or the banking system is not suitable for individuals; 0 otherwise
<b>Why does one not Save Money in the Bank</b>		
6	nosave_nomoney	1 for individuals who do not save money in the bank because they do not have money or regular income; 0 otherwise
7	nosave_noneed	1 for individuals who do not save money in the bank because they do not need savings in the bank; 0 otherwise

Table 1: (Continued)

No	Dependent Variables	Descriptions
<b>Why does one not Get Loans from the Bank?</b>		
8	noborrow_noneed	1 for individuals who do not borrow money from the bank because they do not need a bank loan; 0 otherwise
9	noborrow_notqualified	1 for individuals who do not borrow money from the bank because they do not meet the requirements for a bank loan; 0 otherwise
10	noborrow_havedebt	1 for individuals who do not borrow money from the bank because they already have debt elsewhere; 0 otherwise
<b>Saving and Credit in Informal Institution</b>		
11	smoney_informal	1 for individuals who save money in informal institutions; 0 otherwise

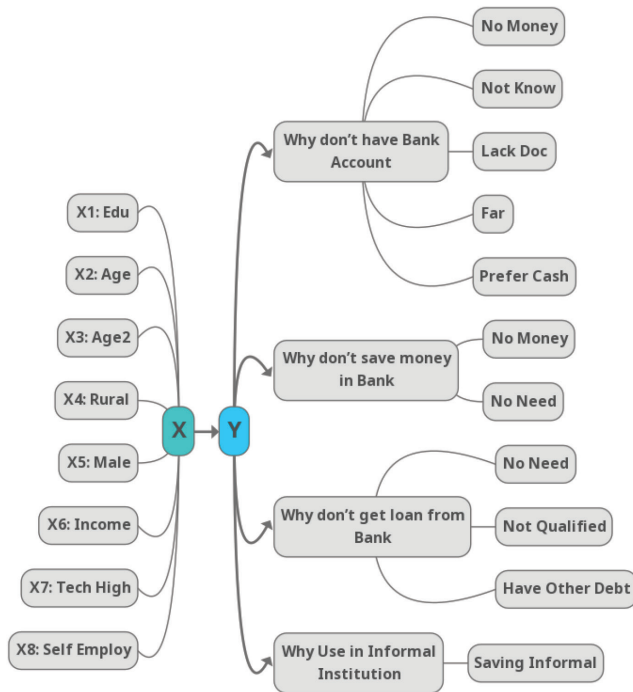


Figure 1: Variables Relation in Model

## 4. Results

### 4.1. Financial Inclusion in the Selected Province in Indonesia

Before analyzing the estimation results of individual barriers to gaining access to formal financial institutions, we review descriptive data descriptions (Table 2). First, the Survey on Financial Inclusion and Access (SOFIA) provides an overview of inclusiveness in eastern Indonesia, particularly in the four observed provinces: East Java, NTB,

NTT, and South Sulawesi. From the overall observations, it is found that financially excluded-population are most likely to be male, people from the poorest households (lowest quintiles of wealth), who live in the rural areas and have no education or just primary education.

Table 2 describes descriptive explanations of the dependent and independent variables used in the estimation; we find that descriptively, the cause of individuals not having an account at the largest formal financial institution is because they do not have money by 77 percent, the next most significant cause is because they prefer to hold cash and do not know with the respective percentages of 9.5 percent and 6.2 percent. We also found that the reasons for individuals not using savings and credit services from the largest formal financial institutions were because they did not need these services, 87.8 percent, and lack of money, 36.6 percent. This is reinforced by the large percentage of individuals who choose to save in informal financial institutions by 77 percent compared to formal, and credit from family and informal financial institutions at 72 percent and 10.8 percent, respectively. The magnitude of the percentage indicates that the tendency of individuals for financial matters still leads to the informal sector, which is further illustrated in Figure 2.

Individual education in the observation is on average at the second level, where we categorize the second level in education as junior high school equivalent. Therefore, the average education in this observation can represent the overall picture of education in Indonesia based on the Central Statistics Agency (BPS). The average education rate in 2017 for those over 15 years of age is 8.5 years or the equivalent of Grade 2 junior high school equivalent. The average age of individuals in this observation is 43 years, 65 percent live in rural areas, and 42 percent are male. As many as 31 percent of observations have access to high technology (smartphone or computer), and 61 percent are classified as self-employed (working alone, owning a micro business, or even a small business).

**Table 2:** Descriptive Statistics

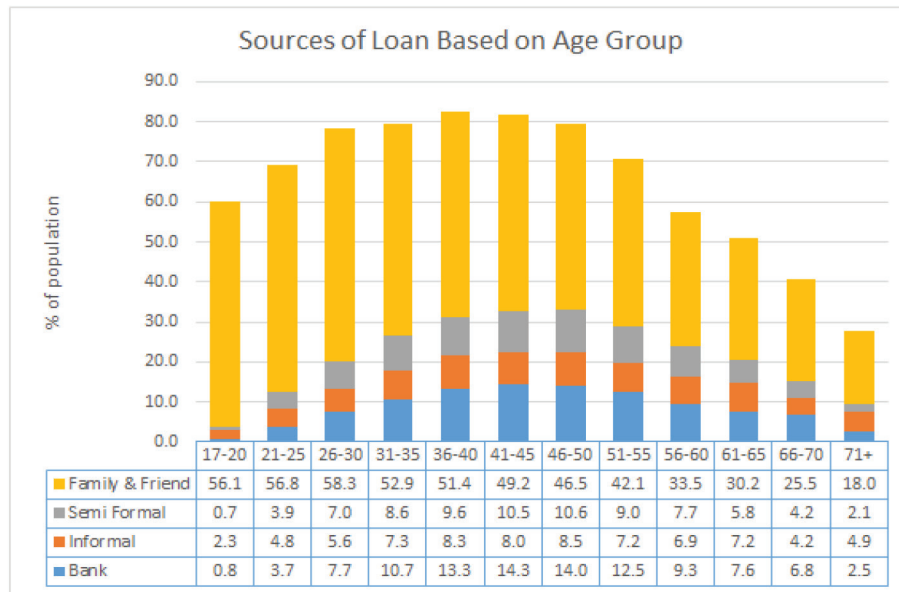
Variables	Obs	Mean	Std. Dev	Min	Max
<b>Dependent Variables</b>					
Noacc_nomoney	11,354	0.779	0.415	0	1
Noacc_notknow	11,354	0.062	0.242	0	1
Noacc_lackdoc	11,354	0.005	0.071	0	1
Noacc_cash	11,354	0.095	0.293	0	1
Noacc_far	11,354	0.024	0.153	0	1
Nosave_nomoney	19,624	0.366	0.482	0	1
Nosave_noneed	7,311	0.016	0.124	0	1
Noborrow_noneed	8,214	0.878	0.327	0	1
Noborrow_notqualified	8,214	0.031	0.172	0	1
Noborrow_havedebt	8,214	0.096	0.294	0	1
Smoney_informal	12,207	0.770	0.421	0	1
Credit_informal	12,398	0.108	0.310	0	1
Semi_formal	12,398	0.122	0.327	0	1
Family	12,398	0.724	0.447	0	1
<b>Independent Variables</b>					
Edu	14,450	2.241	1.259	1	6
Age	19,639	43.923	14.855	17	101
Age2	19,639	2149.926	1416.284	289	10201
Rural	19,639	0.654	0.476	0	1
Male	19,639	0.427	0.495	0	1
Ln_Income	19,202	13.437	1.805	7.601	21.753
Tech_high	19,639	0.314	0.464	0	1
Self_employe	6,468	0.612	0.487	0	1

Based on the age grouping of respondents in figure 2, the main sources for obtaining money loans for all age groups are family or friends. More than 50 percent of the population before 40 years of age chose to get loans from family or friends, and as we get older, this trend is decreasing. When compared to sources of loans between banks and informal, it is found that the young age group, namely 17–20 and 21–25 respectively, have a greater percentage of obtaining loan sources from informal sources with a difference of 1.5 percent and 1.1 percent, respectively. As it increases, the age percentage of loans from banks is greater than informal, but at the age of more than 71 years, the percentage of informal returns is higher than banks by a difference of 3.9 percent.

#### 4.2. The Determinant of Barriers to Access Formal Financial Services

Table 3 displays the result probit marginal effect estimation for in the first part of barrier formal financial services, which explains the determinants of why individuals do not have bank accounts for some reason as the dependent variable.

Being educated people will significantly decrease the probability of not knowing about formal financial services by 1.76 percent. Age has a non-linear relationship pattern across all estimates. At the beginning of increasing age, the probability of an individual having no money as a reason for not having an account increases. On the other hand,

**Figure 2:** Sources of the Loan Based on Age Group**Table 3:** Barriers to have the Formal Financial Service Account

	Why does not one have a Bank Account?				
	No Money	Don't Know	Lack Document	Prefer Cash	Far
Edu	-0.0132 (0.00955)	<b>-0.0176***</b> (0.00492)	0.00118 (0.0013)	0.0058 (0.00647)	0.00344 (0.00312)
Age	<b>0.0135***</b> (0.00408)	<b>-0.00378**</b> (0.00169)	<b>-0.00122**</b> (0.000576)	<b>-0.00950***</b> (0.00263)	0.00176 (0.00175)
Age2	<b>-0.000156***</b> (0.0000483)	<b>0.0000407**</b> (0.0000197)	<b>0.0000120*</b> (7.14E-06)	<b>0.000115***</b> (0.000031)	-0.0000237 (0.0000218)
Rural	<b>0.0654***</b> (0.0187)	<b>-0.0147*</b> (0.0081)	<b>-0.00511*</b> (0.00264)	-0.0183 (0.0128)	0.00593 (0.0069)
Male	0.00476 (0.0181)	-0.00982 (0.00767)	0.000491 (0.00267)	0.00911 (0.0126)	-0.00172 (0.00633)
Lnincome	<b>-0.0434***</b> (0.00571)	<b>-0.00732***</b> (0.00241)	0.00099 (0.000878)	<b>0.0139***</b> (0.00393)	<b>0.00445**</b> (0.00203)
Tech_high	<b>-0.125***</b> (0.021)	0.00296 (0.00971)	0.00199 (0.00294)	<b>0.0712***</b> (0.0142)	0.00455 (0.00742)
Self_employ	<b>0.0552**</b> (0.0224)	0.00821 (0.0108)	-0.000178 (0.00309)	-0.0118 (0.0155)	<b>-0.0150**</b> (0.0073)
N	2207	2207	2207	2207	2207
Log-likelihood	-1068.1295	-354.88816	-93.818908	-672.0666	-256.87272
Pseudo R <sup>2</sup>	0.0829	0.0402	0.1021	0.0584	0.0426

Estimated marginal effects are presented and standard errors are in parentheses \* $p < 0.10$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ .



the initial increase in age has a decreased probability of ignorance, document incompleteness, and the principle of choosing to hold cash, whereas at the time of further increasing age (age2) will be the opposite and with a smaller probability magnitude.

We find that a more significant level of individual income will reduce the probability of having no money by 4.3 percent and not knowing by 0.73 percent as reasons for not having a bank account. Individual dummies who work as self-employed, own micro-businesses, or small businesses have a significant and positive effect on the probability of not having money by 5.5 percent as the cause of account ownership constraints. This is because, on average, the income of individuals classified as self-employees is 75 percent. This is lower than the average individual income as a whole. In addition, individuals classified as self-employed also have a

probability of having a negative influence on how far the location of formal financial services can be reached. In other words, individuals classified as self-employed do not have problems in terms of distance but the availability of funds.

In addition, to analyze the determinants of individual barriers not having a formal financial services account, we examine the determinants of individual barriers to using formal financial services as a place for saving or getting a loan; Table 4 reports the estimations.

Education has a high relationship with income, and an increase in education level significantly reduces the probability of individuals having no money as the cause for not using formal financial services as a place to save money or wealth by 4.9 percent. Initially, increasing age will significantly reduce the probability of not needing a loan from formal financial services by 2.9 percent. It is

**Table 4:** The Barrier to Saving and Credit on Formal Financial Service

	Why does one not Save Money in the Bank?		Why does one not get a Loan from the Bank?		
	No Money	No Need	No Need	Not Qualified	Have Debt
<b>Edu</b>	<b>-0.0495***</b> (0.00649)	-0.00157 (0.00123)	-0.00742 (0.00841)	-0.00374 (0.00354)	<b>0.0129*</b> (0.00779)
<b>Age</b>	-0.00262 (0.0034)	0.000518 (0.000703)	<b>-0.0296***</b> (0.00558)	0.00324 (0.00221)	<b>0.0335***</b> (0.00553)
	0.0000456 (0.0000404)	-0.00000869 (0.00000906)	<b>0.000304***</b> (0.0000638)	-0.0000433 (0.0000266)	<b>-0.000336***</b> (0.0000627)
<b>Rural</b>	<b>0.0466***</b> (0.0143)	-0.00269 (0.00237)	-0.00764 (0.0195)	0.0122 (0.00792)	0.0053 (0.0182)
	<b>0.146***</b> (0.0141)	<b>0.00876**</b> (0.00418)	-0.0324 (0.0201)	0.0106 (0.00833)	0.0289 (0.0188)
<b>Lnincome</b>	<b>-0.0559***</b> (0.00459)	<b>-0.00313**</b> (0.00125)	<b>-0.0130*</b> (0.00722)	<b>-0.00663**</b> (0.002790)	<b>0.0251***</b> (0.0069)
	<b>-0.0958***</b> (0.0162)	<b>0.00533*</b> (0.00307)	0.0182 (0.0245)	-0.00125 (0.00954)	-0.00821 (0.023)
<b>Self_employ</b>	<b>0.106***</b> (0.0174)	0.00136 (0.00268)	<b>0.125***</b> (0.0264)	<b>-0.0263**</b> (0.0102)	<b>-0.134***</b> (0.0247)
<b>N</b>	<b>4965</b>	<b>1558</b>	<b>1691</b>	<b>1691</b>	<b>1691</b>
<b>Log-likelihood</b>	<b>-2548.591</b>	<b>-88.228993</b>	<b>-223.36506</b>	<b>-705.06315</b>	<b>-22.130324</b>
<b>Pseudo R<sup>2</sup></b>	<b>0.1706</b>	<b>0.1753</b>	<b>0.0382</b>	<b>0.1420</b>	<b>0.1230</b>

Estimated marginal effects are presented, and standard errors are in parentheses. \* $p < 0.10$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ .

also known based on Figure 1 that an individual's early age has a high percentage of obtaining loans from family or friends, informal and semi-formal financial institutions. We also have found that more than 50 percent of individuals before the age of 40 choose to borrow from family and friends.

Living in rural areas has a four-percent higher probability of not having money as a cause of not using formal financial services for savings than individuals living in urban areas. It is known that the average income of individuals living in urban areas is 12.56 percent higher than individuals living in rural areas in the observation.

Being male has a higher probability of not saving in the formal financial institutions by 14.6 percent and 0.87 percent, respectively, because they do not have money and consider it unnecessary compared to women. An increase in the percentage of income will increase the probability of individuals not borrowing money from formal financial institutions because they already have other loans. Besides that, an increase in the percentage of individual income has a significantly lower probability of not using formal financial services due to their absence. Money does not need and does not deserve that access. Individuals' ownership of high technology access (computers and smartphones)

has a significant probability of not saving money in formal financial institutions due to the absence of money, which is 9.5 percent lower than individuals who do not have access to high technology.

Being an individual who is classified as a self-employee, has a micro-business or a small business has a probability of not making contact with a formal financial institution in the form of a saving of 10 percent due to lack of money, not making a loan of 12.5 percent compared to individuals who are not self-classified work. The low average income from self-employees does not make other debt ownership the cause for not taking loans from formal financial institutions. Individuals classified as self-employed have a significantly lower probability of having another loan, 13.4 percent, than individuals who are not self-employed.

### 4.3. Determinants of Driving to Access Informal Financial Services

To strengthen the analysis of the determinants of individual barriers to use formal financial services, we estimate the individual determinants that encourage using informal financial institutions as a place for saving and credit (Table 5).

**Table 5:** Encouraging the use of Informal Financial Service

	Saving Money in Informal Institution	Borrow Money Informal Institution		
		Informal	Semi-Formal	Family
<b>Edu</b>	<b>-0.0500***</b> (0.00741)	<b>-0.0167***</b> (0.00479)	<b>-0.00934*</b> (0.00528)	<b>-0.0401***</b> (0.0075)
<b>Age</b>	<b>-0.0178***</b> (0.00476)	0.00415 (0.00276)	<b>0.0275***</b> (0.00397)	<b>-0.0286***</b> (0.00486)
<b>Age<sup>2</sup></b>	<b>0.000175***</b> (0.0000572)	-0.0000479 (0.0000333)	<b>-0.000285***</b> (0.0000476)	<b>0.000238***</b> (0.0000581)
<b>Rural</b>	<b>0.0639***</b> (0.017)	<b>-0.0383***</b> (0.0102)	<b>-0.0263**</b> (0.0119)	<b>0.0915***</b> (0.0167)
<b>Male</b>	<b>-0.152***</b> (0.017)	<b>-0.0265***</b> (0.00981)	-0.0161 (0.0117)	<b>-0.0319*</b> (0.0167)
<b>Inincome</b>	<b>-0.0134**</b> (0.00662)	0.00253 (0.0033)	<b>0.00884**</b> (0.00428)	<b>-0.0368***</b> (0.00595)
<b>Tech_high</b>	<b>-0.0657***</b> (0.0211)	<b>-0.0340***</b> (0.0121)	<b>0.0246*</b> (0.0143)	<b>-0.0621***</b> (0.0201)
<b>Self_employ</b>	<b>0.0855***</b> (0.0219)	<b>0.0407***</b> (0.0129)	<b>-0.0950***</b> (0.0151)	<b>0.0980***</b> (0.021)
<b>N</b>	<b>3379</b>	<b>3657</b>	<b>3657</b>	<b>3657</b>
<b>Log likelihood</b>	<b>-1924.9298</b>	<b>-1173.0326</b>	<b>-1469.4012</b>	<b>-2017.5807</b>
<b>Pseudo R<sup>2</sup></b>	<b>0.1017</b>	<b>0.0435</b>	<b>0.0624</b>	<b>0.1312</b>

Estimated marginal effects are presented, and standard errors are in parentheses. \* $p < 0.10$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ .



Education has a significant influence on all estimates. An additional 1 level of individual education reduces the probability of saving and credit from the informal institutions. In other words, the higher the education of an individual will encourage him to choose a formal financial institution rather than an informal one.

In this estimation, it is also found that age has a non-linear form, where increasing age will significantly reduce the probability of individuals saving money in informal institutions by 1.78 percent. However, at a specific turning point, increasing age has a positive probability of encouraging individuals to save money in the informal financial institution with a more negligible probability, namely 0.0175 percent. In addition, increasing age will initially increase the probability of borrowing money from semi-formal by 2.75 percent, but borrowing money from the family has a decreased probability of 3.8 percent. Then at a certain age turning point, an increase in age will increase the probability of borrowing money from a more prominent family than from the semi-formal sector, even with a smaller coefficient.

Living in rural areas makes individuals have a 6.3 percent higher probability of saving in the informal than individuals living in urban areas. In addition, individuals living in rural areas significantly prefer to borrow money from family or friends than from informal or semi-formal financial institutions. Male individuals have a lower probability of saving and borrowing from informal financial institutions by 15.2 percent and 2.6 percent, respectively, than women. The increase in the percentage of individual income significantly reduces the probability of saving in informal financial institutions by 1.3 percent and increases the probability of approaching formal institutions due to the increase in credit probability from semi-formal institutions. Individual ownership of high technology access reduces the probability of having a relationship with informal financial institutions than individuals who do not have high technology access. We also find that individuals who are classified as self-employed have the probability of approaching the informal sector.

## 5. Conclusion

We use the Survey on Financial Inclusion and Access (SOFIA) from the Ministry of National Development Planning 2017, which includes 20,000 respondents spread across 93 regions in Indonesia. With an individual scale, we estimate using binary logistic regression in the form of probit. We found that education, high technology, and income positively influenced the use of formal institutions. Meanwhile, the turning point of old age, living in rural areas, and self-employment has the opposite effect.

To sum it up, our research has interesting findings that can be used as policy recommendations in Indonesia. For example, strategic groups as targets for increasing

inclusiveness meet the requirements in formal financial activities, have high financial needs but prefer the informal sector, including those classified as self-employed, and live in rural areas, are classified as young or adult. In addition, to increase inclusiveness, the government should pay attention to the habit of preferring cash by old age, attractive formal savings, and loan offers for rural people or self-employment.

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