



Exploring determinants of Indonesia's financial inclusion level: Based on 2017 Global Findex data

Indah Susilowati^a, Muhammad Kanzul Fikri^{b*}, Devy Mayang Sari^c, Abdul Razak^d, Uswatun Khasanah^e, Mentari Anggun Djatayu^f, Ika Suciati^g

^a Faculty of Economics and Business, Diponegoro University, Semarang, Indonesia; prof.indah@gmail.com

^b Faculty of Economics and Business, Diponegoro University, Semarang, Indonesia; makfik@students.undip.ac.id*

^c Faculty of Economics and Business, Diponegoro University, Semarang, Indonesia; devymayangsarii@students.undip.ac.id

^d Faculty of Economics and Business, Diponegoro University, Semarang, Indonesia; abdulrazak@students.undip.ac.id

^e Faculty of Economics and Business, Diponegoro University, Semarang, Indonesia; uswatuunkh@students.undip.ac.id

^f Faculty of Economics and Business, Diponegoro University, Semarang, Indonesia; mentariangundj@students.undip.ac.id

^g Faculty of Economics and Business, Diponegoro University, Semarang, Indonesia; ikasuci741@gmail.com

ARTICLE INFO

Article History:

Received 05-26-2023

Revised 04-02-2024

Accepted 04-29-2024

Kata Kunci:

Indonesia, inklusi keuangan, tingkat pendapatan, tingkat pendidikan, gender, tingkat usia

Keywords:

Indonesia, financial inclusion, income level, education level, gender, age level

ABSTRAK

Penelitian ini bertujuan untuk menganalisis pengaruh tingkat pendapatan, tingkat pendidikan, gender, dan tingkat usia terhadap tiga indikator utama inklusi keuangan yaitu probabilitas kepemilikan rekening pada lembaga keuangan formal, probabilitas menabung pada lembaga keuangan formal, dan probabilitas meminjam dari lembaga keuangan formal di Indonesia tahun 2017. Data diperoleh dari Global Findex 2017 dengan metode purposive sampling. Penelitian ini menggunakan metode analisis regresi logistik dengan model estimasi logit menggunakan software Stata 16. Hasil penelitian menunjukkan bahwa pada hasil estimasi probabilitas tingkat kepemilikan rekening pada lembaga keuangan formal dari keseluruhan variabel independen yang digunakan, hanya variabel gender yang menunjukkan hasil tidak signifikan sedangkan variabel lainnya menunjukkan nilai negatif signifikan. Pada model estimasi probabilitas menabung pada lembaga keuangan formal, terdapat dua variabel yang tidak signifikan yaitu usia dan gender sedangkan variabel lainnya menunjukkan hasil negatif signifikan. Terakhir, pada probabilitas meminjam pada lembaga keuangan formal, hanya variabel tingkat pendidikan dasar yang menunjukkan hasil negatif signifikan, sedangkan variabel lainnya menunjukkan hasil tidak signifikan. Implikasi penelitian ini memberikan wawasan tentang pendapatan, pendidikan, gender dan

*Corresponding Author

usia dan dampaknya terhadap inklusi keuangan.

A B S T R A C T

This research aims to analyze the influence of income level, education level, gender, and age level on the three main indicators of financial inclusion, namely the probability of having an account at a formal financial institution, the probability of saving at a formal financial institution, and the probability of borrowing from a formal financial institution in Indonesia on 2017. Data was obtained from Global Findex 2017 using a purposive sampling method. This research uses a logistic regression analysis method with an assisted logit estimation model using Stata 16 software. The research results show that when estimating the probability of account ownership levels at formal financial institutions, only the variable gender shows insignificant results. In contrast, the other variables show significant negative values. In the model for estimating the probability of saving at formal financial institutions, two variables are not significant, namely age and gender, while other variables show significant negative results. Finally, on the probability of borrowing from formal financial institutions, only the basic education level variable shows significant negative results, while the other variables show insignificant results. The implications of this research provide insight into income, education, gender, and age and their impact on financial inclusion.

INTRODUCTION

A country's economic development relies heavily on financial inclusion. Financial inclusion refers to people's ability to access financial goods and services such as bank accounts, loans, insurance, and investments. High levels of financial inclusion can increase economic prosperity and reduce inequality. The level of financial inclusion in Indonesia, one of the countries with the largest population in the world, greatly impacts societal welfare and economic growth (Beck *et al.*, 2007; Bruhn & Love, 2014). A high level of use of bank deposits results in a more stable deposit base for banks in difficult times. Thus, financial inclusion allows people to save for the future and thus can promote financial stability (Han & Melecky, 2013). Research on the impact of financial inclusion on poverty conducted by Dixit & Ghosh (2013) explained that providing access to financial services has the potential to remove poor people from the vicious cycle of poverty through a culture of saving, saving, and making it possible to create efficient and low-cost payment mechanisms.

The development of the financial sector depends on financial inclusion, which is very important for the economy. Reducing credit barriers for businesses, increasing consumption, and providing opportunities to use resources for productive investment are all outcomes of a developed financial sector. In contrast, communities with financial resources invest in education, finance projects, entrepreneurship, and skills

development (Demirgüç-Kunt *et al.*, 2020). Financial inclusion became a trend after the 2008 crisis, especially due to the impact of the crisis on groups at the bottom of the pyramid. From 2011 to 2014, 700 million people became new owners of accounts at banks, other financial institutions, and mobile money service providers. According to the World Bank and the European Commission, financial inclusion is a comprehensive effort to remove all obstacles that prevent people from using or utilizing financial services (Nugroho & Purwanti, 2018).

The results of the 2022 National Survey of Financial Literacy and Inclusion (SNLIK) show an increase in the financial literacy index of Indonesian society to 49.68 percent, up from 38.03 percent in 2019. Meanwhile, the public financial inclusion index increased to 85.10 percent this year from the previous period SNLIK in 2019 (76.19 percent). This shows that the gap between literacy and financial inclusion is decreasing from 38.16 percent in 2019 (Figure 1). The survey selected four categories: sharia, region, gender, and education. The financial inclusion index for the Sharia category reached 12.12 percent, while the urban and rural area categories reached 86.73 percent and 82.69 percent, respectively. The male gender category reached 86.28 percent and women 83.88 percent, and for the education category consisting of not attending school/not graduating from elementary school at 64.74 percent, graduating from elementary school at 74.24 percent, graduating from junior high school at 80.61 percent, graduating from high school 90.46 percent, and tertiary education 96.51 percent (Otoritas Jasa Keuangan, 2022).

The level of financial inclusion in Indonesia is still low because there are many challenges in accessing formal financial institutions. This challenge is caused by people's lack of financial literacy or knowledge about the functions of financial institutions and products that do not suit the needs of low-income people (Nugroho & Purwanti, 2018). However, individual characteristics at the income level in Indonesia can also be associated with financial inclusion. Household and individual income levels significantly impact their access to financial services. Data shows that lower-income groups have less access to formal financial institutions, such as banks, perhaps because they have financial problems that make it difficult to get credit or open a bank account. This aligns with research conducted by Hermes & Lensink (2011), which found that the crisis significantly affected household income.

As a consequence, access to financial services can be hampered. Research by Demirgüç-Kunt *et al.* (2020) showed that despite an increase in financial inclusion overall, the level of inclusion among low-income groups is still a concern. On the other hand, groups with high incomes have more choices and can more easily access formal financial services. Education level, in addition to income level, has a significant influence on financial inclusion. Higher education tends to make them better understand the benefits of financial services, better manage their finances, and be more likely to seek financial solutions that suit their needs.

On the other hand, lower education may mean they do not know how to make good use of financial services (Demirguc-Kunt & Klapper, 2012). This is in line with research by Beck *et al.* (2007) that shows that financial literacy significantly mediates the influence of education level on financial inclusion. The research results show the need for more intensive financial literacy programs among people with low levels of education. The research of Narayan & Juhro (2021) explained groups of people with various levels of education. This study identifies that advancements in fintech offer new opportunities for financial inclusion, particularly among traditionally underserved groups.

Gender differences are also very important in financial inclusion. Compared to men, women tend to be less involved in finances. Some of the reasons behind these differences include social and cultural barriers, unequal access, and differences in levels of workplace engagement (Duflo, 2012). Research conducted by The World Bank (2019) revealed inequalities between men and women in accessing financial services, with women often facing greater barriers. This research is the main impetus for further research on the impact of gender on financial inclusion. The research of Hasler & Lusardi (2017) highlighted that financial literacy can be a key factor in addressing the gender gap in access to financial services. The results of this research create a better understanding of how increasing financial literacy can empower women financially.

Age can also influence financial inclusion. Compared with older generations, younger generations may differ in how they use financial services. Advances in digital technology can also influence financial inclusion because the younger generation tends to be more familiar with digital services and technology. Therefore, regarding financial inclusion in Indonesia, the age factor must be considered (Demirgüç-Kunt *et al.*, 2020). This research aims to see how income, education, gender, and age influence the three main indicators of financial inclusion: the possibility of having an account, saving, and borrowing from formal financial institutions in Indonesia. Research conducted by Kandari *et al.* (2021) revealed significant differences in access and use of financial services between certain age groups. Research by Lusardi *et al.* (2014) highlighted that financial literacy is important in ensuring optimal participation in financial services in old age.

This research aims to analyze the factors that influence the level of Financial Inclusion in Indonesia, focusing on the probability of having an account at a formal financial institution, the probability of saving at a formal financial institution, and the probability of borrowing at a formal financial institution. Many studies have been conducted on financial inclusion, but few have used logistic regression analysis methods with a logit estimation model. This country was chosen because Indonesia has high economic and social diversity, including differences in income levels between regions, varying levels of urbanization, and cultural diversity. The main contribution

of this study to the literature is the attempt to analyze the influence of income level, education level, gender, and age on the level of Financial Inclusion.

This paper consists of five parts. Section 1 describes the research background. Section 2 explains the literature overview and empirical evidence regarding income level, education level, gender, and age level on three financial inclusions. Section 3 explains the data and model using logistic regression analysis with a logit estimation model. Section 4 presents the results of the analysis and discussion. Section 5 concludes the research results.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

The level of financial inclusion in Indonesia is still low because there are many challenges in accessing formal financial institutions. This challenge is caused by people not knowing much about finance or the functions of financial institutions. In addition, financial institutions' products do not suit the needs of low-income people. This is supported by a survey conducted by the OJK in 2013, which found that the Indonesian population was divided into four groups based on their knowledge of finance: good (21.84 percent), sufficient (75.69 percent), poor (2.06 percent), and don't know (0.41 percent). However, financial inclusion can also be linked to individual characteristics. In Indonesia, young age, poverty levels, and low education increase the likelihood of financial inclusion. However, the differences between men and women are relatively small (Nugroho & Purwanti, 2018).

The main indicators of financial inclusion, according to the World Bank, consist of having an account (formal account), saving at a formal financial institution (formal savings), and borrowing from a formal financial institution (formal credit). Keynes's consumption theory explains that saving is a luxury. So, Keynes believes that rich people save a higher proportion of their income than poor people (Mankiw, 2007). Irving Fisher then developed the Intertemporal Choices Model. Fisher analyzed how rational consumers make choices over time (in different periods). If they consume more now, they will be able to consume less.

The money demand theory can explain the motive for saving. People who tend to make frequent payment transactions will prefer to hold cash. Meanwhile, when interest rates increase, people save money through savings or deposits. The Life Cycle Theory by Franco Modigliani also explains a person's tendency to save where consumption throughout an individual's life is considered constant. When starting work until retirement, individuals will save and accumulate assets (saving). Meanwhile, at the end of the working period, namely when entering early retirement, he will use his accumulated assets by using his savings (dissaving) in the final period of his life.

Income on Financial Inclusion

Income is an important component determining the financial inclusion level in Indonesia. A study conducted by Global Findex in 2017 found that individuals with higher incomes tend to have greater access to formal financial services. This is due to their ability to invest, open bank accounts, and gain access to various types of financial products. People from low-income groups often face difficulties opening bank accounts and getting credit, making it difficult for them to be financially inclusive.

Fungáčová & Weill (2015) conducted research in China. Their research found that formal accounts were related to each person's income level. All three groups with the lowest income have significant and negative dummy variables, and the group with the lowest income has a higher coefficient. These results align with the study of Demirgüç-Kunt & Klapper (2013), which found a positive correlation between income and financial inclusion. The impact on income is usually small in formal savings and credit. Compared to other countries, China has a very high level of financial inclusion. However, the use of formal credit is still low in China because many people cannot get bank credit. According to Nugroho & Purwanti (2018), the level of education statistically influences the possibility of owning an account and saving at a formal financial institution. Still, it does not affect the possibility of borrowing from a formal financial institution. If someone has a higher level of education, they are more likely to have a bank account and save at a legally recognized financial institution. This is because people who have higher education have broader knowledge and insight. Financial services are available and accessible to all people and companies, regardless of income level or location. This is called financial inclusion. Education has been determined as an important element that can influence financial inclusion. Ajayi & Ross (2020) denoted that free basic education (FPE) is associated with using formal financial services and better academic outcomes. Education is very important for improving one's financial knowledge. Keynes's consumption theory states that saving is a luxury. Therefore, Keynes believes that rich people save a higher proportion of their income than poor people (Mankiw, 2007). When a person's income is higher, this income is not only spent on consumption but also on other things, such as accessing financial services. Individuals with higher incomes can also set aside money for saving, investing, and using other financial products so that the probability of having an account and saving will be higher for individuals with higher incomes. Thus, we formulate the following hypothesis:

H1: Income influences financial inclusion.

Education on Financial Inclusion

Financial inclusion refers to the availability and accessibility of financial services to all individuals and businesses, regardless of income level or location. Education has been determined as an important component that can affect financial

inclusion. According to research by Ajayi & Ross (2020), free primary education (FPE) is associated with improved academic outcomes and the use of formal financial services. Education is very important to improve individual financial knowledge. Human capital theory explains that education increases human capital and productivity, enabling people to participate in and benefit from the financial system. Educated individuals will better understand and use financial products and services (Nurkholis, 2018). Financial literacy gained through education will equip individuals with the knowledge, skills, attitudes, and behaviors necessary to manage money and make sound financial decisions. This encourages financial inclusion based on financial literacy theory (Ajayi & Ross, 2020). Khan *et al.* (2022) found financial literacy positively correlates with financial inclusion. Education can also affect an individual's level of trust in the financial system. Those with higher levels of education tend to have more trust in financial institutions and are more prepared to use formal financial services. This can contribute to an increase in society's financial inclusion. Therefore, we formulate the following hypothesis:

H2: Education influences financial inclusion.

Gender on Financial Inclusion

In Indonesia, money plays an important role in financial inclusion. According to 2017 data from Global Findex, the younger generation is more interested in financial technology innovations such as digital payments and banking services via mobile phones. However, several problems arise when incorporating older ages into the financial system. Special efforts are required to ensure they can obtain financial services because they may not be familiar with technology (The World Bank, 2018). Based on financial literacy theory, women's financial literacy and knowledge are generally lower, thus inhibiting the use of financial products and services (Mutakim & Retnowati, 2018). Hundie & Tulu (2023) highlighted that every financial inclusion metric studied in Ethiopia shows statistically significant gender gaps. More specifically, the Daymont and Andrisani approach results show that differences in socioeconomic characteristics between men and women explain gender differences in formal savings, formal accounts, formal loans, and emergency funds. On the other hand, gender differences are 9.8 percent, 8.4 percent, and 5.8 percent in debit card and formal account ownership, respectively.

In addition, the inequality seen in all financial inclusion indicators is influenced by gender differences in the number of people involved in financial markets. In Ethiopia, gender differences in financial inclusion are influenced by age, income, education, employment, and mobile phone ownership. Age, occupation, and education have a greater influence on financial inclusion, supported by older age, more education, employment, and wealth. It is very important to change gender in economic activities to increase income, employment opportunities, and support. Financial

inclusion means that financial services are available and accessible to all people and companies, regardless of income level or location. The research by Fungáčová & Weill (2015) highlighted no inequality between women and men regarding formal savings in China. There is no gender gap in financial account ownership in Indonesia (Sastiono & Nuryakin, 2019). Other studies by Demirgüç-Kunt & Klapper (2013) showed different results that confirmed the existence of a gender gap in formal account holding, formal savings, and access to formal credit. Women are more likely to be excluded from using financial instruments because of insufficient collateral, lack of financial literacy, poor husband's creditworthiness, and little or no business experience. So, we formulate the following hypothesis:

H3: Gender influences financial inclusion.

Age on Financial Inclusion

Age has a significant impact on all three inclusion indicators, each with positive and negative impacts, according to (Fungáčová & Weill, 2015). As a result, there is a non-linear correlation between age and financial inclusion. Older people use formal financial services more than others, but this only applies to certain ages. This is due to "generation effects," which can come from either supply or demand. Older people may be more reluctant to use formal financial services because they may not be used to using them. Financial institutions probably won't try harder to attract older customers. Allen *et al.* (2016) found a non-linear relationship between age and formal accounts in global data. Based on digital literacy theory, lower literacy, and digital technology skills hinder digital financial inclusion in the older age group (Lusardi & Mitchell, 2014). Research by Nugroho & Purwanti (2018) denoted that age (squared) was also used to explain age. The results show that having an account and saving at a formal financial institution will decrease with age. Although the probability of having an account and saving at a formal financial institution increases with age, the probability of having an account and saving at a formal financial institution will also decrease in Indonesia at some point. Age has a non-linear effect on financial inclusion. Financial inclusion is higher among adults and lower among older age groups. Adult individuals are more likely to have accounts, save, and borrow from formal financial institutions. However, at a certain age, this possibility will decrease. Looking at the marginal effect of their Probit estimation, education and income are the most important factors affecting financial inclusion. They also found that African countries have lower levels of financial inclusion than other countries (Mossie, 2023). Thus, we formulate the following hypothesis:

H4: Age influences financial inclusion.

Research Framework

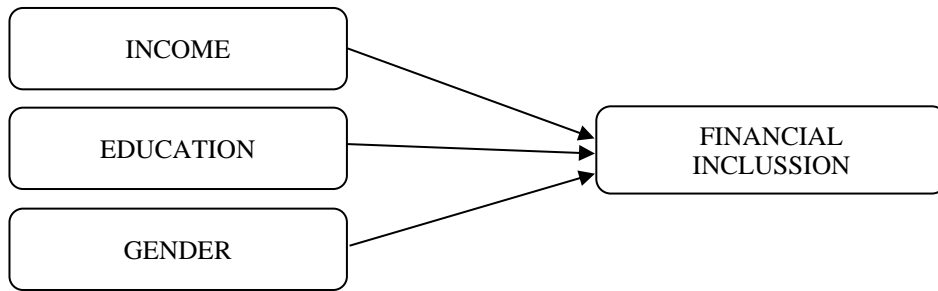


Figure 2
Research Framework

RESEARCH METHODS

Data Types and Sources

The data used in this study was obtained from The World Bank (2017) and the Global Findex, 2017, based on survey data collected by Gallup Inc. (as part of the Gallup World Poll). The 2017 Global Findex Database was compiled using a nationally representative survey of more than 150,000 adults aged 15 and older in 144 countries. From each country surveyed, approximately 1,000 people were randomly selected and interviewed. All civilians (except those who have entered formal institutions) constitute the survey's target population. This research uses a purposive sampling method, focusing on the age range 15-65 years, generally considered the productive age range. The number of respondents we studied was 953 respondents.

The 2017 Global Findex database includes up-to-date indicators on access to and use formal and informal financial services. The report has additional data on the use of financial technology (fintech), including the use of mobile phones and the internet to conduct financial transactions. The data reveals opportunities to expand access to financial services for the unbanked - that is, the underbanked - and encourage greater use of digital financial services for those with accounts. It also provides micro-level information, such as gender, age, income, and education, which will be used in this study (Bekele, 2023). The current study focuses on the determinants of financial inclusion in Indonesia.

Building on related literature, such as Anyangwe *et al.* (2022); Bekele (2023); Hundie & Tulu (2023); Mazanec *et al.* (2022); Nugroho & Purwanti (2018). This study focuses on three main financial inclusion indicators: account ownership at formal financial institutions, loans at formal financial institutions, and savings ownership at formal institutions. Account ownership at a formal financial institution refers to the individual having a bank account either at a financial institution or through a mobile/digital money provider. Formal savings ownership refers to the individual saving money using an account at a formal financial institution in the past 12 months. Borrowing from a formal financial institution means that the individual borrowed from

a financial institution in the last 12 months. All the financial inclusion indicators above are dummy variables that take the value of 1 if the respondent answers "Yes" and 0 if the respondent answers "No." The variable names, variable descriptions, and indicators of the explanatory/exempt variables are presented in Table 1.

Table 1
The Interpretation Variables

Variable	Description	Indicator
Dependent Variables		
Probability of account ownership at formal financial institutions	The probability of having or not having account ownership at formal financial institutions	Values 1 if you have an account and 0 if you do not have an account at a formal financial institution.
Probability of loans at formal financial institutions	The probability of loans and not loans at formal financial institutions	Values 1 if you have loans and 0 if you do not have loans at a formal financial institution.
Probability of saving at formal financial institutions	The probability of saving and not saving at formal financial institutions	Values 1 if you have a savings account and 0 if you do not have a savings account at a formal financial institution.
Independent Variables		
Education Level	There are three education levels: primary, secondary, and tertiary.	Values 1 for primary and secondary education and 0 for tertiary education.
Income Level	There are five income levels: very poor, poor, middle, upper middle, and rich.	Values 1 if it has a very poor, poor, middle, upper middle-income level and 0 if it is rich.
Age Level	There are two age levels: less than 15-24 years old and more than 24 years old	Values 1 if it has an age level between 15-24 years old and 0 if more than 24 years old
Sex	Represents the gender of the respondents	Values 1 if female and 0 if male

Source: Global Findex 2017, data processed

Data Analysis Technique

A logit estimation model was used to determine the effect and significance level of each indicator of the level of financial inclusion with Global Findex data 2017. The Logit model in this study was developed from the estimation model previously developed by Waweru & Mose (2022). The logit model is used to see the effect of independent variables on the dependent variable. The dependent variable is discrete (dummy variable) with values 1 and 0, while the independent variable is non-discrete. In general, the logit estimation model is expressed in Equation (1) below:

$$Li = \frac{Pi}{1-Pi} = b0 + \sum_{j=1}^k b_j X_{ij} \dots\dots\dots 1$$

Where:

Li: Logit estimation model. It takes the value of 1 if there is a financial inclusion level (ownership of account at a formal financial institution, saving at a formal financial institution, and borrowing at a formal financial institution) and 0 if there is no financial inclusion level.

P_i: Probability

X_{ij}: Independent Variable

Based on the logit estimation model in Equation (1), the model development in this study is as shown in Equation (2) below:

$$Li = \frac{Pi}{1-Pi} = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + \dots + b_8X_8 \dots\dots\dots 2$$

Where:

X₁: Very Poor

X₂: Poor

X₃: Medium

X₄: Upper Middle

X₅: Primary Education

X₆: Secondary Education

X₇: Age

X₈: Gender

ANALYSIS AND DISCUSSION

Financial inclusion and individual characteristics in Indonesia

This study found that 18.99 percent of participants fell within the 15-24 age range, with 81.01 percent falling between 25 and 65 years old. The average age across all respondents was 37 years. Additionally, the gender breakdown revealed that 61.18 percent were female, while 38.82 percent were male. These findings indicate a diverse representation of demographic characteristics among the study participants.

Table 2
Descriptive statistics

Measurements	N	Minimum	Maximum	Mean	Std. Deviation
Financial Inclusion					
Ownership of accounts in Formal Financial Institutions	953	0	1	0.36	0.482
Saving in Formal Financial Institutions	953	0	1	0.25	0.436
Borrowing from Formal Financial Institutions	953	0	1	0.19	0.394
Determinant					
Age	953	15	65	37.0	12.79
Gender	953	0	1	0.61	0.487
Income (Poorest 20%)	953	0	1	0.16	0.372
Income (Poor 20%)	953	0	1	0.17	0.384
Income (Middle 20%)	953	0	1	0.18	0.391
Income (Second 20%)	953	0	1	0.19	0.397
Income (Rich 20%)	953	0	1	0.27	0.444
Primary Education	953	0	1	0.32	0.469
Secondary Education	953	0	1	0.63	0.480
Tertiary Education	953	0	1	0.03	0.180

Source: Global Findex 2017, data processed

In the 2017 Global Findex report, the World Bank groups income into five quintiles: very poor 20 percent, poor 20 percent, middle 20 percent, upper middle 20 percent, and rich 20 percent. The details are as follows: there are 157 respondents from the very poor category 20 percent, 171 respondents from the poor category 20 percent,

180 respondents from the middle category 20 percent, 187 respondents from the upper middle category 20 percent, and 258 respondents from the rich category 20 percent. Furthermore, the percentage value for each determinant of the three indicators of financial inclusion in Indonesia is as follows: The percentage of bank account ownership shows a positive relationship with income level, indicating that the higher a person's income, the more likely they are to have a bank account (Figure 3). However, on the contrary, the proportion of account ownership at formal financial institutions in Indonesia decreases in line with the decline in lower income quintiles.

In Figure 4, a similar pattern can also be seen in the percentage of savings in formal financial institutions. The percentage of savings in formal financial institutions in Indonesia tends to decrease along with lower income quintiles and vice versa. At the highest income level (Rich), the percentage of savings in formal financial institutions reached 41.09 percent, while at the lowest (Poorest), it only reached 11.46 percent. Different findings can be seen in the third indicator of financial inclusion, namely the percentage of borrowing from formal financial institutions. This indicator does not show a downward trend at lower income levels. The highest percentage of borrowing from formal financial institutions occurred at the Middle-income level (24.44 percent), followed by the Second (22.99 percent), Rich (19.27 percent), Poorest (15.92 percent), and Poor (12.28 percent) (Figure 5).

In terms of respondents, the majority came from secondary education with a total of 313 respondents, followed by primary education with 608 respondents, and higher education with 32 respondents. When linked to individual characteristics such as education level, financial inclusion in Indonesia shows a similar trend in two main indicators: account ownership and saving in formal financial institutions. In all these indicators, individuals with a higher level of education tend to have a higher percentage of account ownership, savings, and borrowing at formal financial institutions (Figure 6). Interestingly, at the basic education level, a unique phenomenon occurs where the percentage of borrowing is higher than the saving percentage, respectively 14.0 percent (borrowing) and 10.4 percent (saving).

There are no significant differences between men and women regarding account ownership and savings in formal financial institutions in Indonesia. Both show similarities with a very slight percentage difference. However, striking differences can be seen in borrowing from formal financial institutions in Indonesia, where the percentage of men is 34.7 percent, much higher than women who reach 18.5 percent (Figure 7). Financial inclusion in Indonesia by age group, shows similar trends in all indicators. Individuals over 24 years have an account ownership percentage of 41.99 percent, savings of 24.31 percent, and borrowing of 9.94 percent, all higher than individuals aged 15-24 years (Figure 8). These figures reflect that the participation of the young population in formal financial institutions is still low. This may be because they are still students without a job and a steady income, in contrast to the age group over 24 years who tend to be working and have an income.

Logit estimation model

Based on the results of Table 3, the determinants that are thought to influence (Age, Gender, Income, and Education) on the three indicators of financial inclusion in Indonesia have been tested using the binary logistics (logit) method.

Table 3
Estimation Results of the Determinant Logit Model for Three Indicators of Financial Inclusion in Indonesia (Odds Ratio)

Determinants	(1) Ownership of accounts in Formal Financial Institutions	(2) Borrowing from Formal Financial Institutions	(3) Saving in Formal Financial Institutions
Age	0.980*** (0.006)	1,012 (0.006)	0.992 (0.006)
Gender	1,163 (0.177)	0.981 (0.167)	1,184 (0.195)
Income (Poorest 20%)	0.190*** (0.049)	0.890 (0.244)	0.232*** (0.067)
Income (Poor 20%)	0.292*** (0.067)	0.645 (0.184)	0.271*** (0.071)
Income (Middle 20%)	0.576*** (0.121)	1,422 (0.337)	0.507*** (0.113)
Income (Second 20%)	0.561*** (0.116)	1,320 (0.312)	0.617** (0.132)
Elementary education	0.91*** (0.041)	0.438* (0.191)	0.117*** (0.049)
Secondary education	0.328** (0.141)	0.709 (0.291)	0.378** (0.144)
Constant	8,699*** (4,344)	0.232*** (0.114)	2,586** (1,201)
Observations	953	953	953

Note: Standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.10

Source: Global Findex 2017, data processed

Data that displays the Exponential Coefficient (Odds Ratio) value, standard error value, and significance value. The Odds Ratio value is used to interpret the influence of independent variables on the probability of the observed event. An Odds Ratio value exceeding 1 indicates that the independent variable positively impacts the probability of an event, while a value below 1 indicates a negative impact. If the value equals 1, the independent variable has no significant impact (Susilowati & Leonnard, 2019).

Ownership of accounts in formal financial institutions

Based on the odd ratio value, the constant value is 8.699. This means that all independent variables, including income, education, gender, and age, will increase the tendency for ownership of accounts in formal financial inclusion by 8.699 times. Based on the odd ratio value of 0.190, income (Poorest 20%) will increase the tendency for

ownership of accounts in formal financial inclusion by 0.190 times. Based on the odd ratio value of 0.292, income (Poor 20%) will increase the tendency for ownership of accounts in formal financial inclusion by 0.292 times. Based on the odd ratio value of 0.576, income (Middle 20%) will increase the tendency for ownership of accounts in formal financial inclusion by 0.576 times. Based on the odd ratio value of 0.561, income (Second 20%) will increase the tendency for ownership of accounts in formal financial inclusion by 0.561 times. Based on the odds ratio value of 0.91, elementary education will increase the tendency for ownership of accounts in formal financial inclusion by 0.91 times. Based on the odds ratio value of 0.328, secondary education will increase the tendency for ownership of accounts in formal financial inclusion by 0.328 times. Based on the odds ratio value of 1.163, gender will increase the tendency for ownership of accounts in formal financial inclusion by 1.163 times. Based on the odds ratio value of 0.980, age will increase the tendency for ownership of accounts in formal financial inclusion by 0.980 times.

Borrowing from formal financial institutions

Based on the odd ratio value, the constant value is 0.232, meaning that all independent variables, including income, education, gender, and age will increase the tendency to borrow from formal financial inclusion by 0.232 times. Based on the odd ratio value of 0.890, income (Poorest 20%) will increase the tendency to borrow from formal financial inclusion by 0.890 times. Based on the odd ratio value of 0.645, income (Poor 20%) will increase the tendency to borrow from formal financial inclusion by 0.645 times. Based on the odd ratio value of 1,422, income (Middle 20%) will increase the tendency to borrow from formal financial inclusion by 1,422 times. Based on the odd ratio value of 1,320, income (Second 20%) will increase the tendency to borrow from formal financial inclusion by 1,320 times. Based on the odd ratio value of 0.438, elementary education will increase the tendency to borrow from formal financial inclusion by 0.438 times. Based on the odd ratio value of 0.709, secondary education will increase the tendency to borrow from formal financial inclusion by 0.709 times. Based on the odd ratio value of 0.981, gender will increase the tendency to borrow from formal financial inclusion by 0.981 times. Based on the odd ratio value of 1.012, age will increase the tendency to borrow from formal financial inclusion by 1.012 times.

Saving in formal financial institutions

Based on the odd ratio value, the constant value is 2.586, meaning that all independent variables, including income, education, gender, and age will increase the tendency to save in formal financial inclusion by 2.586 times. Based on the odd ratio value of 0.232, income (Poorest 20%) will increase the tendency to save in formal financial inclusion by 0.232 times. Based on the odd ratio value of 0.271, Income (Poor 20%) will increase the tendency to save in formal financial inclusion by 0.271 times. Based on the odd ratio value of 0.507, income (Middle 20%) will increase the tendency

to save in formal financial inclusion by 0.507 times. Based on the odd ratio value of 0.617, income (Second 20%) will increase the tendency to save in formal financial inclusion by 0.617 times. Based on the odd ratio value of 0.117, elementary education will increase the tendency to save in formal financial inclusion by 0.117 times. Based on the odd ratio value of 0.378, secondary education will increase the tendency to save in formal financial inclusion by 0.378 times. Based on the odd ratio value of 1.184, gender will increase the tendency to save in formal financial inclusion by 1.184 times. Based on the odds ratio value of 0.992, age will increase the tendency to save in formal financial inclusion by 0.992 times.

Income influences financial inclusion

In the context of the determinant of income level (Income Quantile), respondents in the income groups (poorest 20%), (poor 20%), (middle 20%), and (second 20%) significantly indicate lower probabilities of owning a bank account and saving compared to the rich 20% income group. Income level consistently contributes positively to the probability of owning a bank account and saving in formal financial institutions. This finding aligns with expectations, where individuals with higher incomes tend to allocate their funds not only for consumption but also to access financial services and store their money in formal financial institutions. These results support previous research by Nugroho & Purwanti (2018; Susilowati & Leonnard (2019).

However, income level does not significantly impact the borrowing indicator in formal financial institutions in Indonesia despite statistically positive odds ratio values for all income levels. This finding differs from the research results by (Nugroho & Purwanti, 2018; Susilowati & Leonnard, 2019), where a significantly positive influence was found, indicating that higher income tends to facilitate easier access to financial services, including loans. Financial institutions are often more willing to lend to individuals with a good credit history and stable income, and these loans are typically used to enhance productive investments and business activities or meet financial needs.

Education influences financial inclusion

Regarding education as a determinant, the probability for respondents with elementary and secondary education to have a bank account and utilize loan services in formal financial institutions tends to be lower than respondents with higher education (tertiary education). This indicates that the level of education can influence access to and trust in products offered by formal financial institutions. However, the difference in probabilities at the elementary and secondary education levels is not statistically significant for the saving indicator. This result differs from the findings of research conducted by Ajayi & Ross (2020); Nugroho & Purwanti (2018), where it was found that the level of education plays a crucial role in increasing knowledge and access to formal financial products, as well as confidence in loan services.

Gender influences financial inclusion

Analysis of gender (male and female) is not significant in terms of the probability of owning a bank account, saving, and borrowing in formal financial institutions in Indonesia. These results support the findings of Fungáčová & Weill (2015), where there is no gender inequality in both men and women regarding the three financial inclusion indicators. This information illustrates that the opportunity to have an account, save, and borrow money at a banking financial institution is regardless of gender or in a narrow sense, it can also be said that the opportunity to have an account, save, and borrow money at a formal financial institution in Indonesia. Meanwhile, analysis of gender differences (male and female) shows no significant impact on the probability of account ownership, saving, and borrowing at formal financial institutions in Indonesia.

Age influences financial inclusion

This research reveals that age significantly negatively impacts indicators of account ownership in formal financial institutions. This information illustrates that a person's probability of saving in a banking financial institution will decrease as age increases. This is most likely due to the decline in ability due to increasing age, along with the tendency for the needs of someone who has aged to decrease. In other words, as one gets older, the probability of someone having an account at a formal financial institution in Indonesia tends to decrease. This decline can be attributed to generational preferences or differences in financial needs associated with changes in age. These findings are in line with the results of previous research, such as those conducted by Johan (2020); Nugroho & Purwanti (2018); Susilowati & Leonard (2019). Meanwhile, neither indicator of borrowing nor saving in formal financial institutions showed significance.

CONCLUSIONS, LIMITATIONS, AND SUGGESTIONS

Based on the results of research conducted on 953 respondents with a focus on the age group of 15-65 years, which is generally considered as the productive age range, it is concluded that Indonesia's financial inclusion based on three main indicators is still low. Individual characteristics that determine financial inclusion in Indonesia are age, income, and education. Age level significantly negatively influences the indicator of account ownership in formal financial institutions. In other words, as age increases, the likelihood of someone having an account at a formal financial institution in Indonesia tends to decrease. Income level consistently contributes positively to the likelihood of having an account with a formal financial institution. Higher-income levels also tend to have easier access to financial services, including loans. Education level: the likelihood of respondents with primary and secondary education having an account is lower than those with tertiary education. This shows that education is important regarding knowledge, access to formal financial

products, and trust in loan services.

As for further research, you can add or replace combinations of variables that can increase the validity of the research results. If possible, you can also add data or series (years) of data to compare results from year to year. Apart from that, further research needs to use other analytical methods to test the robustness of the research results.

REFERENCES

- Ajayi, K. F., & Ross, P. H. (2020). The effects of education on financial outcomes: Evidence from Kenya. *Economic Development and Cultural Change*, 69(1), 253–289. <https://doi.org/10.1086/702996>
- Allen, F., Demirguc-Kunt, A., Klapper, L., & Martinez Peria, M. S. (2016). The foundations of financial inclusion: Understanding ownership and use of formal accounts. *Journal of Financial Intermediation*, 27, 1–30. <https://doi.org/10.1016/j.jfi.2015.12.003>
- Anyangwe, T., Vanroose, A., & Fanta, A. (2022). Determinants of financial inclusion: Does culture matter? *Cogent Economics & Finance*, 10(1), 2073656. <https://doi.org/10.1080/23322039.2022.2073656>
- Beck, T., Kunt, A. D., & Levine, R. (2007). Finance, inequality and the poor. *Journal of Economic Growth*, 12(1), 27–49.
- Bekele, W. D. (2023). Determinants of financial inclusion: A comparative study of Kenya and Ethiopia. *Journal of African Business*, 24(2), 301–319. <https://doi.org/10.1080/15228916.2022.2078938>
- Bruhn, M., & Love, I. (2014). The real impact of improved access to finance: Evidence from Mexico. *The Journal of Finance*, 69(3), 1347–1376. <https://doi.org/10.1111/jofi.12091>
- Demirguc-Kunt, A., & Klapper, L. (2012). *Measuring financial inclusion: The Global Findex database* (Policy Research Working Paper; WPS 6025).
- Demirguc-Kunt, A., & Klapper, L. (2013). Measuring financial inclusion: Explaining variation in use of financial services across and within countries. *Brookings Papers on Economic Activity, Spring*, 279–321.
- Demirguc-Kunt, A., Klapper, L., Singer, D., Ansar, S., & Hess, J. (2020). The Global Findex database 2017: Measuring financial inclusion and opportunities to expand access to and use of financial services. *The World Bank Economic Review*, 34(Supplement 1), S2–S8. <https://doi.org/10.1093/wber/lhz013>
- Dixit, R., & Ghosh, M. (2013). Financial inclusion for inclusive growth of India: A study of Indian states. *International Journal of Business Management & Research (IJBMR)*, 3(1), 147–156.
- Duflo, E. (2012). Women empowerment and economic development. *Journal of Economic Literature*, 50(4), 1051–1079. <https://doi.org/10.1257/jel.50.4.1051>

- Fungáčová, Z., & Weill, L. (2015). Understanding financial inclusion in China. *China Economic Review*, 34, 196–206. <https://doi.org/10.1016/j.chieco.2014.12.004>
- Han, R., & Melecky, M. (2013). *Financial inclusion for financial stability: Access to bank deposits and the growth of deposits in the global financial crisis* (Policy Research Working Paper Series 6577).
- Hasler, A., & Lusardi, A. (2017). *The gender gap in financial literacy: A global perspective*. Global Financial Literacy Excellence Center. The George Washington University School of Business.
- Hermes, N., & Lensink, R. (2011). Microfinance: Its impact, outreach, and sustainability. *World Development*, 39(6), 875–881. <https://doi.org/10.1016/j.worlddev.2009.10.021>
- Hundie, S. K., & Tulu, D. T. (2023). Determinants of financial inclusion gender gap in Ethiopia: Evidence from decomposition analysis. *Cogent Business & Management*, 10(2), 2238124. <https://doi.org/10.1080/23311975.2023.2238124>
- Johan, S. (2020). Users' acceptance of financial technology in an emerging market (An empirical study in Indonesia). *Jurnal Ekonomi Dan Bisnis*, 23(1), 173–188. <https://doi.org/10.24914/jeb.v23i1.2813>
- Kandari, P., Bahuguna, U., & Salgotra, A. K. (2021). Socio-economic and demographic determinants of financial inclusion in underdeveloped regions: A case study in India. *Journal of Asian Finance, Economics and Business*, 8(3), 1045–1052. <https://doi.org/10.13106/jafeb.2021.vol8.no3.1045>
- Khan, F., Siddiqui, M. A., & Imtiaz, S. (2022). Role of financial literacy in achieving financial inclusion: A review, synthesis and research agenda. *Cogent Business & Management*, 9(1), 2034236. <https://doi.org/10.1080/23311975.2022.2034236>
- Lusardi, A., & Mitchell, O. S. (2014). The economic importance of financial literacy: Theory and evidence. *Journal of Economic Literature*, 52(1), 5–44. <https://doi.org/10.1257/jel.52.1.5>
- Lusardi, A., Mitchell, O. S., & Curto, V. (2014). Financial literacy and financial sophistication in the older population. *Journal of Pension Economics and Finance*, 13(4), 347–366. <https://doi.org/10.1017/S1474747214000031>
- Mankiw, N. G. (2007). *Makroekonomi* (6th ed.). Jakarta: Erlangga.
- Mazanec, J., Bartosova, V., & Bohm, P. (2022). Logit model for estimating non-profit organizations' financial status as a part of non-profit financial management. *Mathematics*, 10(13), 2162. <https://doi.org/10.3390/math10132162>
- Mossie, W. A. (2023). Financial inclusion drivers, motivations, and barriers: Evidence from Ethiopia. *Cogent Business & Management*, 10(1), 2167291. <https://doi.org/10.1080/23311975.2023.2167291>
- Mutakim, J., & Retnowati, E. (2018). Pembelajaran literasi keuangan bagi perempuan rentan. *Jurnal AKRAB*, 9(2), 72–83. <https://doi.org/10.51495/jurnalakrab.v9i2.185>

- Narayan, P. K., & Juhro, S. M. (2021). Maintaining stability, promoting sustainable growth amidst global challenges. *Buletin Ekonomi Moneter Dan Perbankan*, 24, 3–6. <https://doi.org/10.21098/bemp.v24i0.1588>
- Nugroho, A., & Purwanti, E. Y. (2018). Determinan inklusi keuangan di Indonesia (Global Findex 2014). *Jurnal Dinamika Ekonomi Pembangunan*, 1(1), 1–13. <https://doi.org/10.14710/jdep.1.1.1-13>
- Nurkholis, A. (2018). Teori pembangunan sumberdaya manusia: Human capital theory, human investment theory, human development theory, sustainable development theory, people centered development theory. In *RePEc: Research Papers in Economics* (INA-Rxiv 8trv7). <https://doi.org/10.31219/osf.io/8trv7>
- Otoritas Jasa Keuangan. (2022). *Infografis hasil survei nasional literasi dan inklusi keuangan (SNLIK) tahun 2022*. <https://ojk.go.id/id/berita-dan-kegiatan/info-terkini/Pages/Infografis-Survei-Nasional-Literasi-dan-Inklusi-Kuangan-Tahun-2022.aspx>
- Sastiono, P., & Nuryakin, C. (2019). Inklusi keuangan melalui program layanan keuangan digital dan laku pandai. *Jurnal Ekonomi Dan Pembangunan Indonesia*, 19(2), 242–262. <https://doi.org/10.21002/jepi.2019.15>
- Susilowati, E., & Leonnard, L. (2019). Factors influence financial inclusion: Evidence from Indonesian micro data. *ETIKONOMI*, 18(1), 121–132. <https://doi.org/10.15408/etk.v18i1.9070>
- The World Bank. (2017). *Global financial inclusion (Global Findex) database 2017 - Indonesia*. Worldbank.Org. <https://doi.org/10.48529/ge2j-v750>
- The World Bank. (2018). *Financial inclusion on the rise, but gaps remain, Global Findex database show*. Worldbank.Org.
- The World Bank. (2019). *Global economic prospects darkening skies* (Issue January). Washington, D.C: World Bank Group.
- Waweru, D., & Mose, N. (2022). Household fuel choice in urban Kenya: A multinomial logit analysis. *Financial Internet Quarterly*, 18(2), 30–41. <https://doi.org/10.2478/fiqf-2022-0011>

APPENDIX

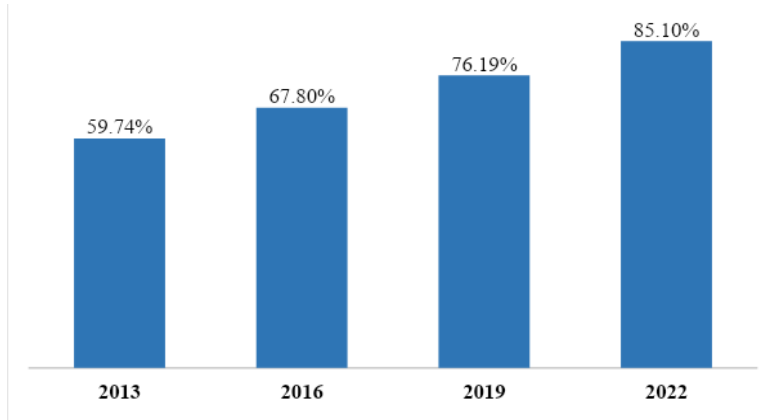


Figure 1
National Financial Inclusion Index 2022
 Source: OJK (2022)

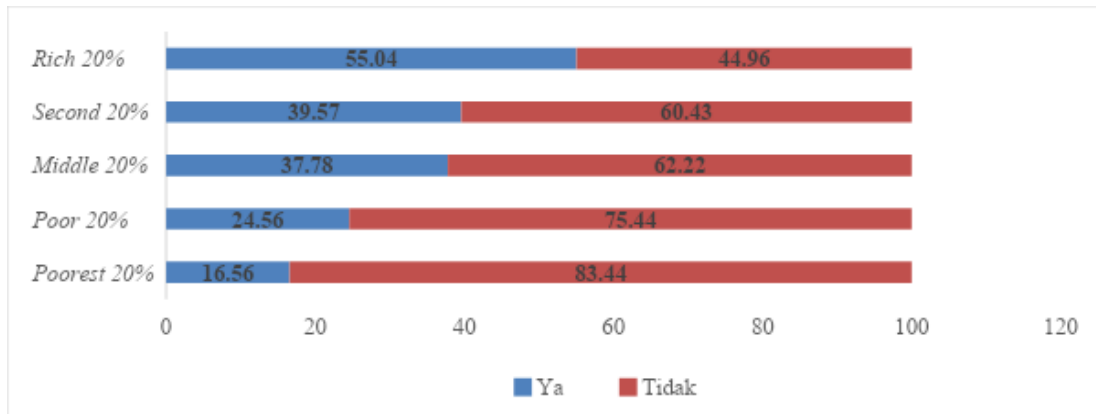


Figure 3
Account Ownership by Income Category (percent)
 Source: Global Findex 2017, data processed

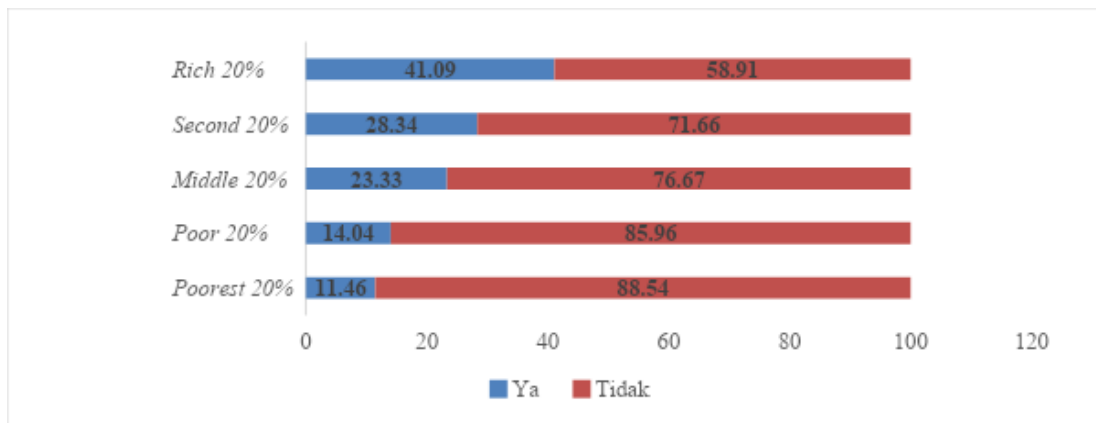


Figure 4
Percentage of Saving (%)
 Source: Global Findex 2017, data processed

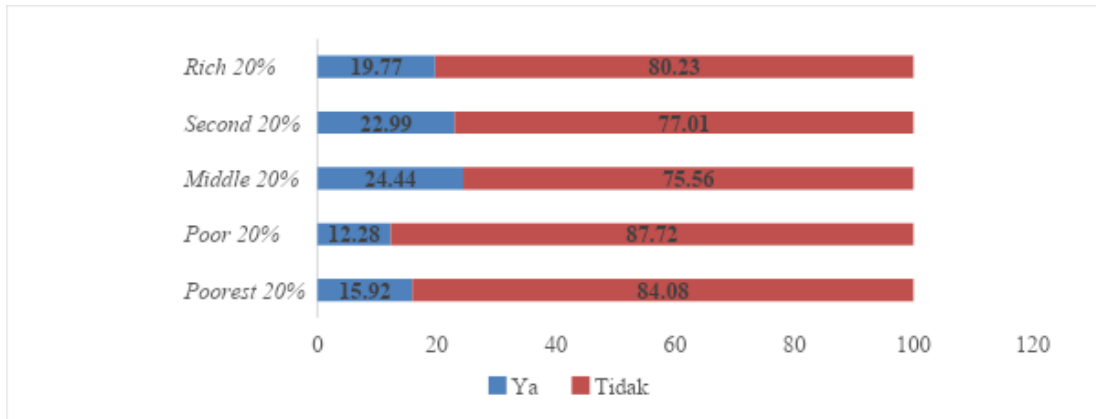


Figure 5
Percentage of Borrowing (%)
 Source: Global Findex 2017, data processed

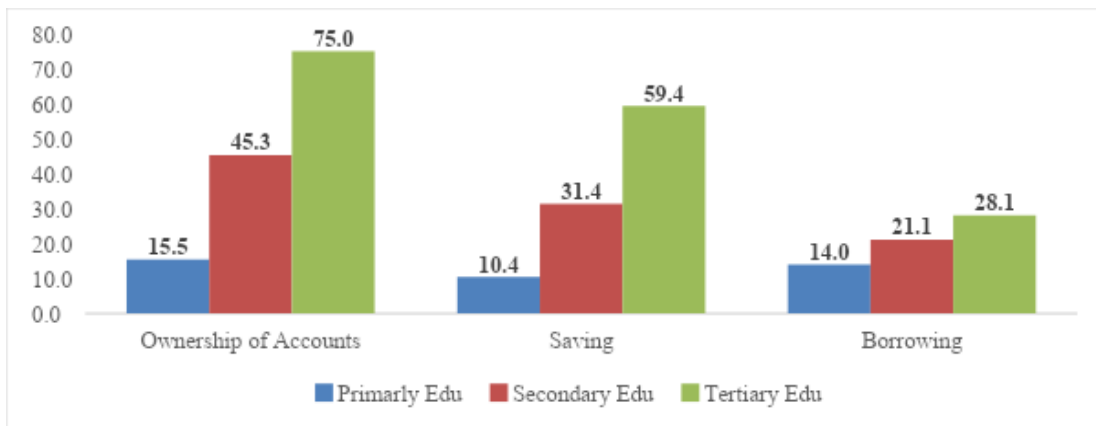


Figure 6
Three Financial Indicators Based on Education Level. (%)
 Source: Global Findex 2017, data processed

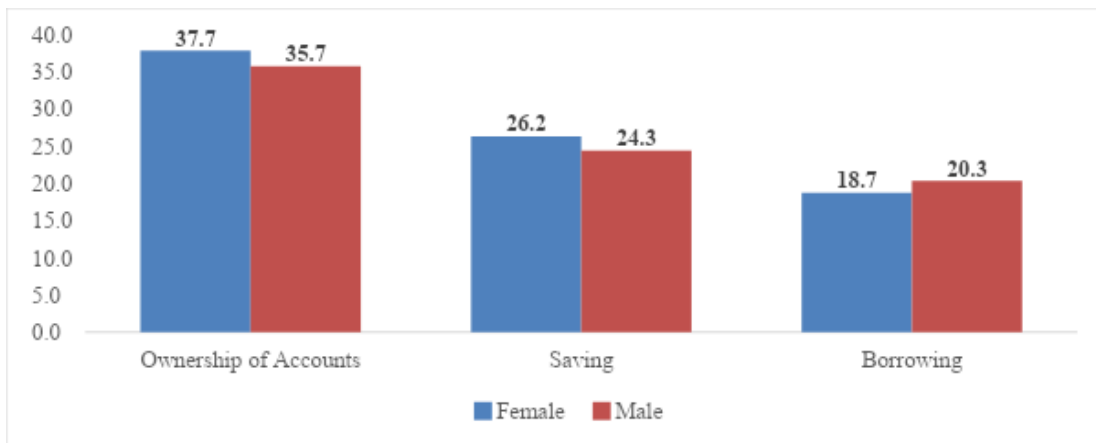


Figure 7
Three Financial Indicators Based on Gender (%)
 Source: Global Findex 2017, data processed

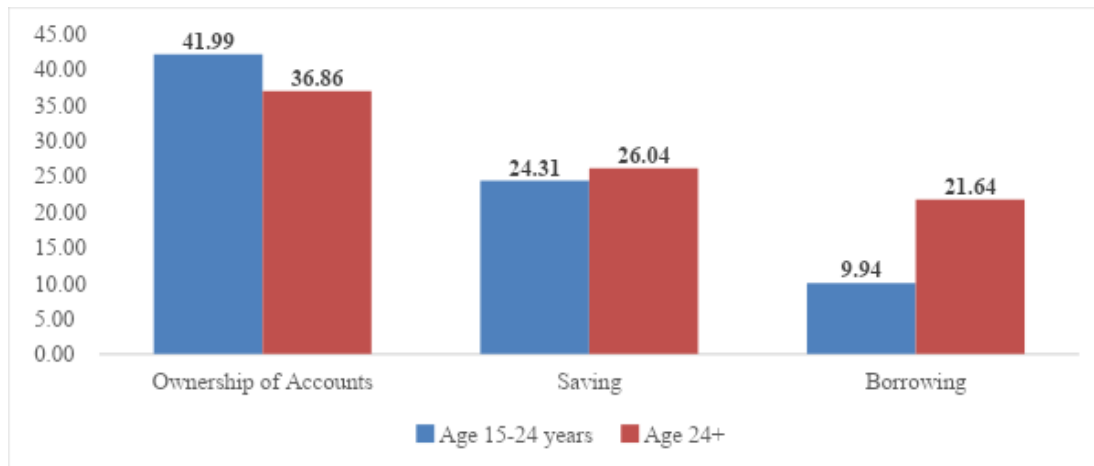


Figure 8
Three Financial Indicators Based on Age (%)
Source: Global Findex 2017, data processed