Financial Inclusion in Ethiopia: Using LSMS (Ethiopia Socioeconomic Survey) Data

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Abstract

Only less than a quarter of Ethiopian adults have a formal account. In this study, the status, level and determinants of financial inclusion and barriers to financial inclusion in Ethiopia are analysed. We found that better education, financial literacy, gender, age, living in an urban area, living in the capital city, and preference for formal financial services are associated with a greater level of financial inclusion in Ethiopia. Furthermore, we found that involuntary and voluntary exclusion are higher in Ethiopia. We recommend policies that could narrow down gender, religious, and urban-rural gaps and foster financial inclusion in Ethiopia.

Key words: financial inclusion; financial institution; Ethiopia
JEL Classification: G29, O16, D14

1. Background

Financial inclusion is gaining momentum worldwide (Oji, 2015). In the developed nations, the concern grew after the 2008 financial crisis. In the developing regions, such as Africa, financial inclusion is one of the discourses in the development agenda. The G-20 summit in Seoul in 2010 decided that financial inclusion must be a global development agenda. Even 11 out of the 17 SDGs are supported by financial inclusion(UNSGSA, 2016). Many African countries, including Ethiopia, are adopting financial inclusion as one of their national strategies. Many of them are exerting a tremendous effort in

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generating evidence by collecting data and employing big surveys supported both by national and international organizations such as the World Bank.

The importance of financial inclusion is manifold. Financial inclusion drives economic growth by helping countries in mobilizing savings and investment. Researchers have found a positive association between financial development and economic growth(Levine, 2005;Demirguc-Kunt & Levine, 2008). Financial inclusion helps individuals in consumption smoothing during shocks, reduces income inequality and poverty, and improves welfare (Beck et al., 2007).

Many researchers struggle to compare their results worldwide (Cámara & Tuesta, 2014). One of the challenges in measuring financial inclusion is the absence of a universally accepted way of measuring it. In general, there are two sets of financial inclusion indicators: account ownership (penetration) and account use.

Account penetration indicator measures individual ownership of formal accounts at a formal financial institution, whereas account use indicator focuses on saving behaviour, source and purpose of borrowing, use of insurance products and other financial products and services.

In this study, we have used three indicators for financial inclusion: account ownership, saving, and the uses of financial products and services including ATM, mobile banking, internet banking and agent banking(Allen et al., 2012; Zins & Weill, 2016).

According to Findex data, 2 billion adults are unbanked worldwide as of 2014. Since 2011, adult population account ownership has risen from 51 to 62percent. Similarly, developing countries are making substantial progress towards financial inclusion. Account ownership has increased, on average, from 41 percent to 54 percent in the same period. In Africa, the average account ownership (35%) is low when compared to both the world and developing countries. Only 22 percent of Ethiopian adults had accounts as of 2016. This is very low compared to the sub-Saharan average (34%). In addition, the use of financial products and services such as savings, ATM,

mobile banking, internet banking and agent banking is in its infancy. For example, mobile banking in the neighbouring Kenya is 75 percent compared to only 1 percent in Ethiopia.

Zins & Weill (2016) and Demirgüç-Kunt & Klapper (2012a) investigated the reason for the low level of financial inclusion in Africa where Ethiopia is one of the samples. However, to the knowledge of the researchers, there is no specific study that is conducted to examine the status and factors for the low level of financial inclusion in Ethiopia using nationally representative data.

Therefore, the main motivation of this study is to find the factors that explain the low-level financial inclusion in Ethiopia. The main contribution of this study is that it highlights the status and level of financial inclusion in Ethiopia. Specifically, it investigates the associations between different socioeconomic and demographic characteristics, such as financial education, financial capability, gender, age, and the residence of individuals and financial inclusion indicators measured by account ownership, use of savings, and financial products and services to understand financial inclusion in Ethiopia. In this realm, a triangulation is made on what are the perceived barriers to financial inclusion. Both voluntary and involuntary exclusions are found common in Ethiopia. Both socioeconomic and geographic factors are associated with perceived barriers for financial inclusion. Finally, we recommend policies that will reduce the barriers and foster financial inclusion in Ethiopia.

The study is organized as follows: section 2 reviews related literature; section 3 presents the method of the study and sampling issues. Both the descriptive and empirical analyses are given in section 4, and finally, we conclude the study with specific policy recommendations in section 5.

2. Literature Review

2.1 Theoretical Literature

The Reserve Bank of India defines financial inclusion as 'the process of ensuring access to appropriate financial products and services needed by vulnerable groups such as weaker sections and low-income groups at an

affordable cost in a fair and transparent manner by mainstream institutional players'(Joshi, 2011:2).

The Banking Association South Africa(2015) further defines financial inclusion in a broader sense as access and usage of a broad range of affordable, quality financial services and products, in a manner convenient to the financially excluded, unbanked and under-banked in an appropriate but simple and dignified manner with the requisite consideration to client protection. Accessibility should be accompanied by usage, which should be supported through the financial education of clients.

Financial inclusion can, therefore, be regarded as the process of promoting equitable access to an affordable and unbiased distribution of financial resources, products and services. All programmes related to financial inclusion are meant to facilitate access as well as to encourage a deepened use of relevant financial products and services for the benefit of all individuals (United Nations, 2006). Financial inclusion can be broadly defined as the proportion of individuals and SMEs that use formal financial services, and is essential for economic development (Rojas-Suarez & Amado, 2014).

Yoshino and Morgan (2016), for example, indicate that greater financial inclusion assists the marginalized sections of society such as low-income groups, rural people, the youth, females, and SMEs. In order to give marginalized groups access to financial services, an efficient financial system that is inclusive should be put in place. It can be deduced, thus, that when poor people are able to manage their limited financial resources, the result will be the reduction of absolute poverty.

Developing countries including Ethiopia are initiating a financial inclusion strategy. This strategy attempts to tackle both the supply side and demand side bottlenecks to financial inclusion. The Ethiopian government has initiated the National Financial Inclusion Strategy to overcome financial inclusion barriers. The strategy aims to improve access to and usage of formal financial products and services using a structured approach based on four interrelated pillars for action: i) strengthen financial and other forms of infrastructure; 2) ensure the supply of an adequate range of suitable products, services and access points;

3) build a strong financial consumer protection framework; and 4) improve financial capability levels (NFIS, 2017).

2.2 Empirical Literature

Though there are improvements towards financial inclusiveness in Africa in recent years, the gap between the developed and developing regions remains big. According to Demirgüç-Kunt & Klapper (2012b), there is disparity among countries in Africa in the level of financial inclusion ranging from 51% in southern Africa to 11% in central Africa. In some countries, 95 percent of their adult population had no formal financial accounts in 2012. Only one individual out of four had a formal account. According to the same study, men and rich and educated people are more likely to have a formal financial account.

Using World Bank's Global Findex database, Zins & Weill (2016) concluded that being a man, richer, more educated and older favour financial inclusion in Africa with a higher influence of education and income. As Mlachila et al. (2016) pointed out, gaps in financial inclusion, particularly those related to economic status and gender, have been compensated to some extent by novel financial services such as mobile payment system and mobile banking, particularly in eastern Africa.

Oji (2015) identifies both supply- and demand-side constraints responsible for the low level of financial inclusion in Africa. Demand constraints such as low levels of financial literacy and supply constraints such as the limited capacity of many African financial institutions are the main impediments for financial inclusion.

A study by Adeola & Evans (2017) reported that the macroeconomic determinants that explain the level of financial inclusion in Africa are per capita income, broad money as a percentage of GDP, literacy, internet access, and the presence of Islamic banking.

A research by Fungáčová & Weill (2015)that used Findex database found that financial inclusion measured by account ownership is not much of a problem

in China. Income and education contribute to greater financial inclusion. The study concludes that a major concern in the short run is the limited use of formal credit. In the long run, obstacles related to gender, income, and education would hamper financial inclusion in China.

In another study on the use of credit in China,Chen & Jin (2017) found that formal credit use is very low. Individuals oftentimes use informal credit. Formal credit is more accessible to socially and economically more advantaged individuals. The poor and the disadvantaged have limited access and use formal credits. The main impediments are an insufficient supply of bank credit in financial markets and households' low financial literacy, particularly low levels of knowledge about formal borrowing.

3. Data and Method of Analysis

3.1 Data

World Bank's 2016 Ethiopian Socioeconomic Survey (ESS) data was used to do our analyses. ESS is a collaborative project between the Central Statistics Agency of Ethiopia (CSA) and the World Bank Living Standards Measurement Study-Integrated Surveys of Agriculture (LSMS-ISA) project. ESS[3] began as ERSS (Ethiopia Rural Socioeconomic Survey) in 2011/12. The second and third waves were conducted in 2013/14 and 2015/16, respectively.

ESS data are panel data sets; however, the earlier two waves do not contain the financial inclusion module. They only contain information on credit at a household level. The survey covered 11,810 individual adults[4], which is a representative sample nationally of 4,958 households. The target population is around 45 million aged 18 and above. The survey questionnaire provided a large number of indicators on financial inclusion that helped to assess the

[3] For detailed information on LSMS - Data: Ethiopiahttp://econ.worldbank.org/WBSITE/EXTERNAL/EXTDEC/EXTRESEARCH/EXTLSMS/0,,contentMDK:23635542~pagePK:64168445~piPK:64168309~theSitePK:3358997,00.html

[4] Individuals aged 18 and above are included in the survey. According to Ethiopia's law, individuals are allowed to have an account if they are 18 years of age or above. This is in contrast to the Findex survey of the World Bank, which considers individuals 15 years of age and above.

amount of account penetration, the use of financial services, the barriers of formal finance, etc. It also provided micro-level information on gender, age, marital status, place of residence, educational level and more.

3.2 Method of Analysis

Our empirical analysis focuses on three dimensions of the financial inclusion: (a) account ownership, (b) use of a formal financial account to save, and (c) use of financial products and services.

The empirical analysis uses both descriptive and econometric methodologies. Graphs and categorical tables are used for the descriptive and probit[5] model estimation econometric analyses. For the binary outcome of the dependent variables, logit and probit probability models are common estimation techniques in statistics. However, probit estimation for the binary outcome is more meaningful and applicable in econometric analysis because interpretations of the coefficient in the model are not the usual parameters; it uses the marginal function coefficients. The probit model analysis proceeds as follows:

The dependent variable y_{ij} stands for owning a formal account, use of a formal account to save, and use of financial product and service; and it is a binary variable. The following model specification is used to investigate its determinants. Similar specifications are found in Demirgüç-Kunt et al. (2015) andZins & Weill (2016).

$$y_{ij}^{*} = \beta_i x_j + \epsilon_{ij} \qquad (1)$$

$$y_{ij} = 1 \quad if \; y_{ij}^{*} > 0$$

$$y_{ij} = 0 \quad if \; y_{ij}^{*} \leq 0$$

[5] The probit estimation is not for causal relationships for financial inclusion indicators and the socioeconomic characteristics of the individual; rather, the method analyses socioeconomic factors affecting the financial inclusion indicators using the marginal function coefficients.

Where financial inclusion indicators and individuals are indexed by i and j, respectively; y_{ij}^{*} is a latent variable; x_j is a vector of individual-level characteristics (explanatory variables); β_i stands forvectors of parameters for each financial inclusion indicators, and ϵ_{ij} representsa normally distributed error term with a zero mean and a variance equal to 1. We estimate (1) as a probit model by maximum likelihood.

Among the individual level characteristics in x_j, we include a number of socioeconomic and demographic variables that would affect the account ownership and use of formal financial accounts.

Female indicates whether the respondent is female. To the extent that it is harder for females to have bank accounts, we expect this variable to have a negative relationship. *Age* and *Age Squared*[6] are both in years. We expect the use of bank accounts to first increase and then decline with age, so in order to capture this non-linearity, *age squared* is included.

Rural takes the value 1 if the respondent lives in a rural area and 0 otherwise. The presence of financial institutions is more limited in rural areas, so we expect this variable to have a negative impact. *Regional* indicates that a respondent lives in different regional states in Ethiopia. There are six such dummies for Tigray, Amhara, Oromia, SNNP, Addis Ababa and Other Regions (all other regions considered as one category) which is excluded categories in the regression. We expect individuals living in Addis Ababa to have a better chance to be financially included.

Each respondent falls into one of the three *education categories* represented by three variables: *0-8 years of education* corresponds to completion of elementary education or less, *9-12 years of education* corresponds to completion of secondary education and *tertiary level of education*. We expect the likelihood of account ownership to increase with the level of education of the individuals.

[6] The trend of age and financial inclusion increase at some age and decrease at older age. It is to capture a non-linear relationship between the two.

Married indicates whether the respondent is married or unmarried. *Unmarried* indicates whether a respondent is divorced, separated or has never been married. *Religion* indicates if the respondent is a Muslim or Christian. It takes the value of 1 if a respondent is Muslim and 0 otherwise.

Financial literacy takes the value of 1 if the respondent knows how to open an account in the formal financial sector and 0 otherwise, a proxy for financial literacy. *Financial capability*, which is a proxy for income indicating on average the person's ability to save 600 *birr* at least once in a year, is considered financially capable, otherwise not. We expect that the higher the income of an individual, the higher the likelihood of financial inclusion. *Shock* takes the value of 1 if the respondent is worried about being able to cover unexpected expenses and 0 otherwise. If the respondents are worried, being able to cover unexpected expenses will have a positive impact on financial inclusion. *Preferences* take the value of 1 if an individual prefers to save money both in formal and informal methods and 0 otherwise. If an individual prefers to use a formal financial method to save their money, it will increase financial inclusion.

4. Descriptive and Econometric Analysis

4.1 Descriptive analysis

In line with the related literature(Demirgüç-Kunt & Klapper, 2013; Fungáčová & Weill, 2015), we focused on three main indicators of financial inclusion. Formal account refers to the fact that the individual has an account at a formal financial institution; use of a formal account refers to savings,[7] and use of financial services refers to employing services like ATM, agent banking, online banking, mobile banking, and other financial products.

Figure 1 shows that 22 percent of adults aged 18 years and above have a formal account and the remaining 78 percent are excluded from the formal financial sector. Only 21 percent of them use the formal account to save and 4.8 percent of adults use financial products or services. The financial inclusion

[7] It would have been possible to include the use of formal credit as one indicator. However, in the dataset, credit information is collected at a household level but this study uses individual-level analysis.

indicators of account ownership in Ethiopia is lower compared to the African average (35 percent) and the world average (61.5 percent). Furthermore, adults' use of a formal account to save is higher both in Africa (15%) and the world (27%) as indicated by the 2014 Global Findex data.

Figure 1: Percentages of Adults with Financial Inclusion Indicators

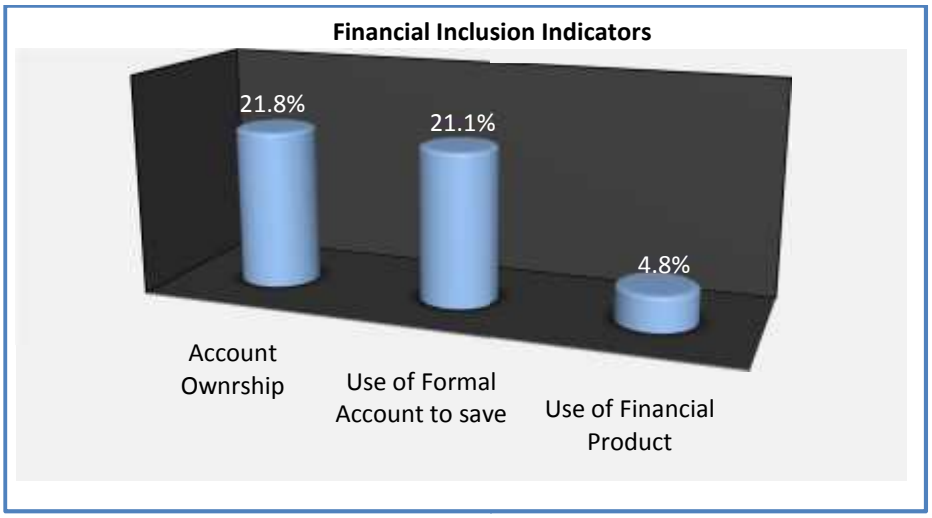


Table 1 presents the descriptive statistics of the three financial inclusion indicators with demographic, social and economic characteristics of individuals. There is a gender gap in all the three financial inclusion indicators. There is a 9-percent gender gap in account opening, a 10-percent gap in the use of an account for saving, and a 3-percent gap in the use of financial products and services. 17 percent of female and 26 percent of male adults are account holders, whereas 26.1 percent of males and 16.5 percent of females use their account to save; 3.2 percent of females and 6.4 percent males use financial products and services. The result is consistent with the study of Demirgüç-Kunt et al.(2015). The gender gap in Ethiopia in account penetration is the highest among developing countries. The global gender gap is 7 but the figure goes up to 9 percent for SSA.

Table 1: Descriptive Statistics Result Financial Inclusion Indicators with Socio-economic and Demographic Variable

Socio-economic and Demographic Characteristics		Account Ownership	Use an account to save	Use of Financial Product
Gender	Male	26.0	26.1	6.4
	Female	17.0	16.5	3.2
Region	Tigray	28.0	27.2	4.4
	Amhara	28.0	24.8	2.7
	Oromia	15.0	14.9	4.0
	SNNP	15.0	14.4	3.8
	Addis Ababa	61.0	61.0	23.4
	Others	17.0	16.9	4.3
Residence	Rural	12.0	10.7	1.2
	urban	50.0	50.0	14.7
Religion	Christian &other	25.0	23.4	3.6
	Muslim	13.0	12.1	2.2
Marital Status	Married	23.0	21.7	4.5
	unmarried	19.0	18.0	5.3
Education level	Elementary &below	19.0	18.7	2.4
	Secondary	36.0	35.9	11.1
	tertiary	79.0	79.0	37.5
Financial Literacy	Yes	54.0	52.6	12.7
	No	3.0	0.9	2.6
Financial capability	Capability to save 600 in 12 month	14.0	12.1	2.4
	Not capable	40.0	39.6	10.2
Shock	worried to cover unexpected expense	21	20	4.6
	Not worried	22	20.5	4.9
Preference	formal	37.0	35.0	8.3
	Informal	2.0	1.5	0.1

Source: ESS

Financial inclusion is higher in urban than rural areas because most formal financial services in Ethiopia concentrate in large towns and the capital cities. Only 12.0, 10.7 and 1.2 percent of individuals who live in rural areas hold

accounts, use formal accounts to save, and use financial services and products, respectively. For individuals who live in urban areas, the figures for the three indicators of financial inclusion are 50, 50.4, and 14.7 percent, respectively. By region, Addis Ababa has the highest percentage of adults with all financial inclusion indicators; 61 percent of the sample population hold accounts and use it for saving, and 23.4 of them use financial products and services. Only 28 percent of Tigray and Amhara and 15 percent of Oromia and SNNP adults have an account. The use of financial products and services in all regions is below 5 percent, except for Addis Ababa.

Financial inclusions are higher among Christians than Muslim. 25 percent of Christians and 13 percent of Muslim are account holders. The proportion of adults in account use for saving also shows the disparity; 23 percent of Christian while only 9 percent of the Muslims use their account to save.

A higher level of education is associated with a higher level of financial inclusion. Account holding is higher among adults with tertiary level of education (79.0%), followed by those who completed secondary level of education (36%). The indicators show a lower level of financial inclusion for individuals that have a primary level of education and those that are uneducated. Thus, an increase in the level of education of adults is associated with a decrease in the level of financial exclusion.

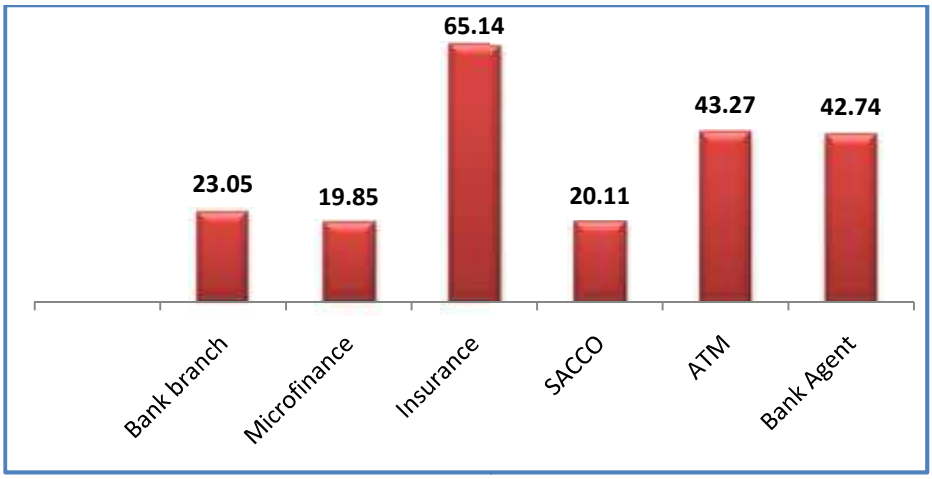
Financial inclusion indicators are also higher among financially literate adults who are aware of how to open an account in the formal financial sector. 54 percent, 52.6 percent, and 12.7 percent of financially literate adults have an account, save in the formal account, and use financial products and services, respectively. However, only 3 percent of financially illiterate adults have an account.

Paradoxically, financial inclusion is higher among financially capable individuals than those that are not. Only 14 percent of individuals who are able to save 600 *birr* at least once in a year (financially capable adults) are account holders, whereas 40 percent of financially incapable ones are account holders. There is no difference in account holding among adults who are worried or not worried about being able to cover unexpected expenses. The proportion of

adults who prefer the formal financial sector to the informal one is higher in account ownership and use of a formal account to save (37 and 35 percent). A small proportion of adults who prefer the informal financial sector are using the formal financial sector.

ESS data informs physical proximity to regulated financial infrastructure in Ethiopia. According to the survey, community leaders or representatives were asked how close infrastructures such as bank branches, MFIs, insurances, SACCOs, ATMs and bank agents are located to their community. In terms of distance, MFIs and SACCOs are the nearest financial institutions that can be accessed on average at about 20 kilometres. These are followed by bank branches, which are accessible to a community on average at 23 kilometres. Insurance is the scarcest of all financial services in Ethiopia. A person travels 65 kilometres on average to find an insurance office.

Figure 2: Distance of Financial Offices from a Community (in kms)



Source: ESS and Authors calculation

The ESS survey includes ten possible perceived reasons that individuals gave for their decision not to have a formal account. In line with Allen et al. (2012), some of these answers can be considered voluntary exclusion ("*lack of money*", "*I prefer informal services*", "*I don't have a reason*", "*I don't understand the benefit*" and "*religious reasons*") while other scan be categorized as involuntary exclusion ("*too far away*", "*the procedure is too*

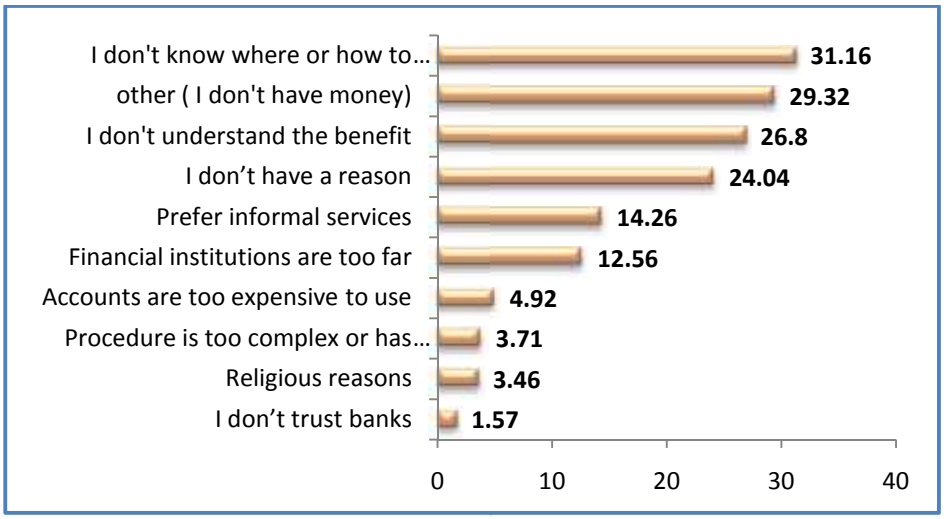
complex", "*too expensive*", "*I don't know where or how to open an account"* and "*lack of trust"*). The distinction between voluntary and involuntary exclusion is of prime importance for policy implications, as involuntary exclusion stresses the presence of obstacles to financial inclusion, which can be alleviated by implementing the right policy (Zins and Weill, 2016).

Figure 2 summarizes the different barriers to account ownership that are perceived by individuals. A first look at the data reveals that '*I don't know where and how to open an account'* is the most often cited reason for not having a formal account in Ethiopia (31%). This reason is an instance of involuntary exclusion of individuals from the formal financial sector. The second most frequently cited reason for not having an account in Ethiopia is *lack of money* (29%), which is a voluntary exclusion. Globally, lack of money is the most common reason for not having an account (59%) (Demirgüç-Kunt et al., 2015). Individuals without sufficient cash earning cannot afford the overall cost of having a formal account.

In Ethiopia, 26.8 percent of the sample population reported that they do not understand the benefits of opening an account. This was followed by '*I don't have a reason* (24%)', '*prefer informal service* (14.26%)', and '*financial institutions are too far* (12.56 %)'as important reasons in explaining financial exclusion in the country. The other reasons perceived as a barriers to financial exclusion like '*I don't trust the financial sector'*, '*religious reason'*, '*accounts are too expensive'*, and '*the procedure is too complex'* were less cited reasons (all together 15%).

Both voluntary and involuntary reasons contribute to the financial exclusion of large proportions of the population in Ethiopia. However, involuntary exclusion due to some obstacles is higher in Ethiopia. The result is similar to BRICS countries, except for China (Chen and Jin, 2017) where there is a higher voluntary exclusion. The result urges policy makers to aim at reducing these barriers and obstacles to reduce involuntary financial exclusion in Ethiopia.

Figure 3: Adult Reasons for not having a Formal Account



4.2 Econometric Analysis

At this point we present our main empirical findings by discussing determinants of financial inclusion indicators. We also present findings on the determinants of barriers to financial inclusion.

4.2.1 Determinants of Financial Inclusion Indicators

The likelihood of owning an account is lower for older age groups and rural dwellers and higher for those who are younger, married, and financially literate and capable; have tertiary education; live in Tigray/Amhara/Addis Ababa; and prefer formal financial institutions (Column 1 of Table 2). These results are in line with those of Allen *et al.* (2012).

Having tertiary education, living in a rural area, and preference for formal financial institutions have similar impacts on the use of formal financial accounts for saving as it has impacted the probability of owning an account. Individuals' characteristics and the financial capability of using a formal account to save have the reverse effect on the likelihood of owning a formal account.

Table 2: Determinants of Financial Inclusion

Variables	(1) account older	(2) Account use	(3) Account use to save
female	-0.00997	-0.0810***	-0.00960
	(0.0112)	(0.0230)	(0.00815)
age	0.0149***	0.0119**	0.000462
	(0.00255)	(0.00570)	(0.00194)
Age square	-0.000140***	-0.000180**	-3.62e-06
	(3.00e-05)	(7.05e-05)	(2.13e-05)
Marital status	0.0443***	-0.0250	0.00178
	(0.0140)	(0.0270)	(0.00999)
religion	-0.0223	0.00219	-0.00468
	(0.0144)	(0.0285)	(0.00984)
secondary	0.0209	0.151***	0.0134
	(0.0132)	(0.0299)	(0.0102)
tertiary	0.154***	0.270***	0.0320***
	(0.0157)	(0.0260)	(0.0117)
rural	-0.0927***	0.000406	0.0263**
	(0.0121)	(0.0332)	(0.0113)
Tigray	0.0473**	-0.0378	0.0171
	(0.0206)	(0.0414)	(0.0159)
Amhara	0.0758***	-0.113***	-0.0173
	(0.0184)	(0.0389)	(0.0148)
Oromia	-0.0209	0.0315	-0.0143
	(0.0174)	(0.0370)	(0.0140)
SNNP	-0.00451	-0.0152	-0.000204
	(0.0198)	(0.0390)	(0.0168)
Addis Ababa	0.0397**	0.0721*	0.00500
	(0.0192)	(0.0373)	(0.0148)
shock	0.0130	-0.0196	-0.00922
	(0.0117)	(0.0222)	(0.00879)
preference	0.201***	0.0273	0.0950***
	(0.0211)	(0.0986)	(0.0188)
Financial literacy	0.254***	0.102	-0.0244
	(0.0136)	(0.0873)	(0.0193)
Capability	-0.124***	-0.0302	-0.0189**
	(0.0113)	(0.0224)	(0.00840)
Observations	6,103	2,293	2,078

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

The last column of Table 2 shows that the likelihood of using financial products and services is lower for females, older people, and people living in the Amhara region and higher for people who are younger, have a secondary and tertiary level of education, and those who live in Addis Ababa. The

detailed correlations of each financial inclusion indicator with other demographic and socioeconomic factors are discussed below.

Both the descriptive and empirical results clearly show that the gender gap is very wide. Our econometric analysis shows that being a woman reduces (8.1%) the likelihood of using financial products and services such as online agents, mobile banking, and internet banking, even after controlling for individual characteristics, which suggests the existence of gender bias. However, as reported in Table 2, Columns 2 and 4, being female does not have an effect on the probability of owning an account and using a formal account to save.

Married people are found to have a greater chance (4.4%) to open an account in the formal financial service while no similar effect is observed for those who are single or divorced. The fact that marriage increases the chance of account ownership may be explained on the ground that married people have increased financial responsibility that leads to a higher demand for financial services (Cámara & Tuesta, 2014).

Positive evidence between general education and financial inclusion is also obtained. Tertiary level education is positively associated with ownership of a formal account. Individuals with tertiary education have a higher chance (15.4%) to open a formal account and use a formal account to save than individuals with only primary education. Secondary and tertiary education increases the likelihood of using financial products and services by 15.1 percent and 27 percent, respectively, compared to no education or only primary education.

Financial inclusion is determined by place of residence, i.e. whether an individual lives in an urban or a rural area and regional disparities are also observed. Living in a rural area reduces the likelihood of owning an account by 9.3 percent compared to living in an urban area. Regionally, adults living in Addis Ababa, Tigray, and Amhara have a higher chance of having a formal account; the marginalities are 4%, 4.7%, and7.6% compared to individuals living in other regional states. Being a rural resident increases the likelihood of using a formal account to save compared to being an urban resident by 2.6

percent. Living in Addis Ababa increases the likelihood of using financial products and services by 7.2 percent, while living in the Amhara region reduces the probability by 11.3 percent.

Individuals' ability to save, a proxy of income, also determines financial inclusion. The ability to save 600 *birr* at least once in a year increases the probability of opening an account by 12.4 percent; however, it reduces use of formal account to save by 2 %.

Individuals' knowledge of how to open an account in the formal financial sector is considered as a proxy for financial literacy. Hence, being financially literate increases the probability of account ownership by 25.4% compared to being financially illiterate.

As expected, preference for the formal financial sector increases the likelihood of both account ownership and use of a formal account to save by 20.1 percent and 9.5 percent, respectively, compared to preference for the informal financial sector.

4.2.1 Determinants of Barriers to Financial Inclusion

In order to see how an individual characteristic exerts an impact on reasons for not having a formal account, we performed an estimation using ten barriers to financial inclusion reported in the survey. The barriers are considered as dependent variables and the different socioeconomic characteristics of individuals as exogenous variables. All the discussions in this section are from the regression result (Table 3 in the Annex section).

Except for 'level of education'[8], the other socioeconomic characteristics of individuals, i.e. regional disparity, being female, religion, living in a rural area, financial capability, preference for the formal financial sector, financial literacy, and shock significantly affect reasons for not having an account. The detailed impact of individual characteristics on each barrier for financial inclusion is discussed below. The result is depicted in the Annex in Table 3.

[8] Secondary education affects preference of informal financial sector.

The characteristic '*Procedures are too complex*' is significantly less likely to be cited as a barrier to open an account in the Tigray region but it is more likely in the SNNP than the reference region (Other region). In addition, individuals with higher incomes are less probable to cite the characteristic '*Procedures are too complex*' as a barrier for financial inclusion.

As expected, distance is one of the main barriers to rural residents, and Muslims are more likely to perceive distance as a barrier to financial inclusion. Conversely, being female; living in Oromia, Tigray, and Addis Ababa; and being financially capable are less likely to be cited as barriers in account ownership. In rural areas 13.2 percent of the population reported distance as a barrier, and 14.2 percent of individuals living in Addis Ababa reported that distance is not a barrier to open an account. Here, one interesting finding was that, unlike men, women perceived distance was not a barrier for account opening. This may indicate that women perceive the characteristic '*other reason*' as a barrier. From the regression result, we found that women did not have reason for not opening an account. This implies voluntary exclusion is significant among Ethiopian women.

The characteristic '*Account opening is too expensive (costly)*' is significantly more likely to be cited as a barrier by individuals living in SNNP and Oromia regions while this is less likely to be the case for individuals living in Addis Ababa.

The characteristics of 'being Muslim; living in a rural area; living in the Amhara, Oromia, and SNNP regions; and living in Addis Ababa are more likely to be reported as reasons for not understanding the benefits of using an account. The marginal effect of 'rural residence' is very high (19.2 percent). However, individuals who prefer formal financial institutions and are financially literate are less likely to report the characteristic '*I don't know the benefit of opening an account*' as a barrier.

The characteristic '*I have no knowledge of where and how to open an account*' is more likely to be reported as a barrier by young people, rural residents, and the SNNP region, but this is less likely to be the case for older and married people, residents of Addis Ababa, and individuals with financial knowledge.

As expected, the marginal effects of residents of Addis Ababa and financially educated individuals are lower (18.7 percent and 21.3 percent, respectively).

The characteristics of being female, being Muslim, living in the four big regions (Tigray, Amhara, Oromia and SNNP), living in Addis Ababa, and being worried about unexpected expenses (shock) are significantly associated with not having an account due to religious reasons. The marginality shows that being Muslim, being male, not being worried about unexpected expenses, and being a resident of 'other regions' are more likely to be associated with religion being a barrier for not having an account.

The characteristics of being young, living in a rural area, and living in Amhara/Oromia/SNNP regions are significantly related with not having an account because they did not trust financial institutions.

Other reasons[9] like 'having no money' considered as a barrier for having an account have significantly been affected by the individual characteristics of being young, being old, being Muslim, being a rural resident, being shocked, being financially capable, living in Tigray/Amhara/Oromia, and preferences.

Individual characteristics like being Muslim, having a secondary level of education, and being financially literate are more likely to prefer informal services as a barrier to having a formal account. However, being worried about unexpected expenses, preference for formal financial services, higher income, living in Tigray/Oromia/Addis Ababa are less likely to prefer informal services as a barrier to having a formal account.

'*I have no reason*' as a barrier to having an account is more likely to affect the characteristics of being female, preference for informal financial services, and being financially literate and less likely to affect the characteristic of living in the Amhara region.

[9] About 95 percent of the respondents cited lack of money among the category of 'other reasons'.

5. Conclusion and Policy Implications

In general, financial inclusion, in terms of all the indicators, is low among Ethiopian adults compared to those in SSA. The survey covered 11,810 individual adults targeting 48 million adults and the analysis was made at an individual level. The survey questionnaire provided a large number of indicators on financial inclusion that help to assess the proportion of account penetration and the use of financial products and services. It also provided micro-level information on gender, age, marital status, place of residence, and educational level.

While the majority of Ethiopians are rural residents, only 12 percent of them have a formal account, 10.7 percent use their account to save, and use of financial products and services is negligible. Regionally, financial inclusion is highest in Addis Ababa, as expected, and lowest in both Oromia and SNNP regions. A gender gap in financial inclusion indicators is also observed. Educated and financially literate adults are exceedingly included in the formal financial sector. Financially capable adults are less included than those that are not.

The empirical specifications focused on three dimensions of the financial indicators: owning a formal financial account, using a formal financial account to save, and using financial products and services. Unusually, rural residents in Ethiopia are more likely to use their accounts to save than urban residents. The existence of gender gap in financial inclusion is also confirmed empirically. Though it is not confirmed using the econometric estimation, there is also a religious gap between Muslims and Christians. Furthermore, both general and financial literacy positively correlate with financial inclusion indicators. Old age lowers the probability whereas young people have a higher probability of being financially included. Preference for formal financial institutions and being married also increase the probability of financial inclusion. Finally, financially capable individuals have a lower probability of being financially included in Ethiopia. We have not found a significant association between financial inclusion and shock. Nor did we find a correlation between financial inclusion and religion.

In Ethiopia, both voluntary and involuntary barriers are responsible for financial exclusion. Both the descriptive and probit estimation inform us that many socioeconomic factors are associated with reasons for not having a formal account among Ethiopian adults. In line with other researchers such as Demirgüç-Kunt & Levine (2008),Fungáčová and Weill (2015),Zins & Weill (2016), and Demirgüç-Kunt et al. (2015), our results show that financial capability (income) and education are the most important factors. Our analysis reveals that both voluntary and involuntary exclusion are the most important barriers in Ethiopia. They are influenced by two types of factors: (1) variables that denote individual vulnerability such as financial capability, gender, age, financial capacity, and level of general education, and (2) geographic variables such as living in rural areas and different regions, being worried about unexpected expenses (shocks), and religion. According to both the descriptive and empirical results, the following policy recommendations are forwarded for a better financial inclusion in Ethiopia.

Government-to-people transfer and vice versa can be made digitalized, for example in the payment of utility bills, school fees, both urban and rural PSNPs, taxes (for the lower tax payer), transportation fees, etc. In Ethiopia, as of 2015/16, there were close to 8 million Productive Safety Net Program (PSNP) beneficiaries in rural Ethiopia. As of 2017, the figure reached 15 million due to the recent recurrent drought. Most of the beneficiaries live in remote areas and are food-insecure households with low incomes. The transfer is made mostly in cash. Therefore, the government can consider this as a good channel to intervene and make the payment via formal accounts.

Promoting both financial and general education. Both general and financial literacy have been found to increase financial inclusion in Ethiopia. Ethiopia has made progress in coverage of general education in the last decade; this should be strengthened, for it also increases financial inclusion. Incorporating financial education into the curriculum and using other tools such as the mass media can be considered for better financial literacy and inclusion.

Addressing the disparity between urban and rural residents and among regions. Financial and other forms of infrastructure, such as electric power, telecommunications, mobile banking, and agent banking can be developed; the

number and branches of microfinance institutions and banks could be increased in the rural areas. Tigray and Amhara regions have a greater number of microfinance institutions that help them to realize better financial inclusion than the other regions. In Oromia and SNNP regions, a special policy intervention, particularly aimed at expanding access points to and use of microfinance, is worth considering. The experience of Tigray and Amhara regions can be used as a benchmark in this case.

Developing suitable products and services for Muslims and vulnerable social groups such as the young, women, and the poor. The descriptive results reveal that financial inclusion varies between Muslims and Christians though the econometric results do not confirm that. However, empirically, religion is found to be one of the barriers to financial inclusion. Products and services that comply with Islamic banking should be developed and expanded. Of course, more surveys should be carried out to know the actual demand for such products and demands. Vulnerable social groups such as women and young people should be reached by developing products and services suitable for them.

Financial education programs targeting females will enable them to develop a reasonable understanding of owning a formal account and how to use financial products and services. Ethiopian females are among the most excluded from the formal financial sector in the world. Products and services that are suitable for females should be creatively designed. Most females live in rural areas and with a low level of both general and financial education. Introducing and expanding agent banking in rural Ethiopia will help females. Both the descriptive and empirical results show that financial inclusion is highly linked to income-generating capability. It is also important to address the issue of gender inequality in economic activities.

Removing physical, bureaucratic, and financial barriers could expand the use of formal accounts. Many of the perceived barriers to open an account have a significant correlation with many of the individual characteristics. Particularly, as pointed out earlier, involuntary forms of exclusion such as '*I don't know where or how to open an account', 'distance'*, '*procedure is too complex'*,

'*too expensive to open an account'*, and *'lack of trust'* can be reduced given the right policy is put in place.

Non-traditional financial services and products such as agent banking and mobile banking should be promoted and expanded in rural Ethiopia. More than 85% of Ethiopians live in rural areas, and distance from financial service providers is a major barrier for financial inclusion. Therefore, along with increasing traditional services such as banking and increasing the number of microfinance branches, it will be better to promote mobile banking and agent banking services.

References

Adeola, O., and Evans, O. (2017). Financial inclusion, financial development, and economic diversification in Nigeria. *The Journal of Developing Areas, 51*(3), 1-15.

Allen, F., Demirguc-Kunt, A., Klapper, L., and Peria, M. S. M. (2012). The foundations of financial inclusion: Understanding ownership and use of formal accounts.

Beck, T., Demirgüç-Kunt, A., and Levine, R. (2007). Finance, inequality and the poor. *Journal of Economic Growth, 12*(1), 27-49.

Cámara, N., and Tuesta, D. (2014). Measuring Financial Inclusion: A Muldimensional Index.

Chen, Z., and Jin, M. (2017). Financial Inclusion in China: Use of Credit. *Journal of Family and Economic Issues*, 1-13.

Demirgüç-Kunt, A., and Klapper, L. F. (2013). Measuring financial inclusion: Explaining variation in use of financial services across and within countries. *Brookings Papers on Economic Activity, 2013*(1), 279-340.

_____. (2012b). Measuring financial inclusion: The global findex database.

_____. (2012a). Financial inclusion in Africa: an overview.

Demirgüç-Kunt, A., Klapper, L. F., Singer, D., and Van Oudheusden, P. (2015). The Global Findex Database 2014: Measuring financial inclusion around the world.

Demirguc-Kunt, A., and Levine, R. (2008). *Finance, financial sector policies, and long-run growth* (Vol. 4469): World Bank Publications.

Fungáčová, Z., and Weill, L. (2015). Understanding financial inclusion in China. *China Economic Review, 34*, 196-206.

Levine, R. (2005). Finance and growth: theory and evidence. *Handbook of economic growth, 1*, 865-934.

Mlachila, M., Cui, L., Jidoud, A., Newiak, M., Radzewicz-Bak, B., Takebe, M., and Zhang, J. (2016). Financial Development in Sub-Saharan Africa: Promoting Inclusive and Sustainable Growth: International Monetary Fund.

Oji, C. K. (2015). Promoting financial inclusion for inclusive growth in Africa: South African Institute of International Affairs.

UNSGSA. (2016). Finacial Inclusion Advancing Sustainable Development *Annual Report to the Secretary-General*: UN.

Zins, A., and Weill, L. (2016). The determinants of financial inclusion in Africa. *Review of Development Finance, 6*(1), 46-57.

Annex

Table 3: Determinants of Barriers to Financial Inclusion

Variables	Complex Process	Too far away	Too Expensive	No Benefit	No knowledge	Prefer informal	Prefer informal	Lack of Trust	Lack of Money	No reason
female	-0.007	-0.0261*	0.00786	-0.0243	-0.0135	0.00836	-0.0168**	-0.00226	-0.0184	0.0479**
	(0.008)	(0.0146)	(0.0102)	(0.0197)	(0.0198)	(0.0157)	(0.00729)	(0.00402)	(0.0220)	(0.0209)
Age	-0.002	0.00123	-0.000337	0.00026	0.00859*	0.00088	0.00197	0.00164	-0.0104**	-0.000467
	(0.002)	(0.00326)	(0.00201)	(0.0040)	(0.00439)	(0.0031)	(0.00162)	(0.00103)	(0.00455)	(0.00459)
Age square	2.54e-0	-9.77e-06	4.71e-07	7.33e-6	-0.000106**	5.96e-0	-1.56e-05	-2.10e-05	0.000124**	-8.29e-06
	(2.57e-)	(3.93e-05)	(2.46e-05)	(4.81e-05)	(5.36e-05)	(3.94e-05)	(2.08e-05)	(1.37e-05)	(5.52e-05)	(5.56e-0)
Marital status	0.0043	0.0236	-0.00264	0.0102	-0.0490*	0.0545***	-0.00917	0.000604	0.00462	0.00396
	(0.013)	(0.0198)	(0.0129)	(0.0253)	(0.0259)	(0.0187)	(0.00826)	(0.00540)	(0.0263)	(0.0265)
Religion	-0.002	0.0394**	-0.00967	0.0593***	0.0180	0.0295*	0.0655***	0.00286	-0.0633***	-0.0214
	(0.009)	(0.0155)	(0.0130)	(0.0204)	(0.0208)	(0.0164)	(0.00823)	(0.00455)	(0.0235)	(0.0250)
Secondary	0.0062	-0.00220	-0.00281	-0.00398	-0.0413	0.0451**	0.0126	0.00488	0.00579	0.0268
	(0.011)	(0.0174)	(0.0125)	(0.0245)	(0.0265)	(0.0201)	(0.00829)	(0.00509)	(0.0262)	(0.0236)
Tertiary	0.0167	0.0118	-0.0122	0.0503	-0.0502	-0.0213	0.00674	-0.00608	0.0346	0.0153
	(0.018)	(0.0404)	(0.0234)	(0.0467)	(0.0522)	(0.0337)	(0.0174)	(0.00813)	(0.0502)	(0.0418)
Rural	0.0082	0.132***	0.0133	0.192***	0.0811***	0.0227	0.00214	-0.0113**	-0.136***	0.00407
	(0.011)	(0.0195)	(0.0118)	(0.0242)	(0.0260)	(0.0181)	(0.00787)	(0.00468)	(0.0241)	(0.0230)
Tigray	-0.03**	-0.0526**	-0.0542	-0.0488	-0.0558	-0.0923***	-0.0209	0.00465	0.0822**	0.0202
	(0.0166)	(0.0253)	(0.0401)	(0.0387)	(0.0369)	(0.0309)	(0.0132)	(0.00791)	(0.0394)	(0.0383)
Amhara	-0.014	-0.0320	0.0195	0.0851***	0.0330	0.0173	-0.0358***	0.0240**	0.0986***	-0.0741**
	(0.015)	(0.0214)	(0.0209)	(0.0323)	(0.0317)	(0.0234)	(0.0124)	(0.00991)	(0.0368)	(0.0344)
Oromia	-0.007	-0.129***	0.0355*	0.0554**	-0.00549	-0.0518***	-0.0143**	0.0187**	0.160***	0.0101
	(0.012)	(0.0175)	(0.0185)	(0.0270)	(0.0271)	(0.0194)	(0.00676)	(0.00853)	(0.0321)	(0.0283)
SNNP	0.0366***	-0.00420	0.150***	0.0693**	0.0680**	-0.0127	-0.0633***	0.0196**	0.0590	-0.0401
	(0.013)	(0.0197)	(0.0194)	(0.0292)	(0.0288)	(0.0216)	(0.0134)	(0.00775)	(0.0362)	(0.0329)

Variables	**Complex Process**	**Too far away**	**Too Expensive**	**No Benefit**	**No knowledge**	**Prefer informal**	**Prefer informal**	**Lack of Trust**	**Lack of Money**	**No reason**
Addis Ababa	-0.023	-0.142***	0.121***	0.0766*	-0.187***	-0.131***	-0.0372*	0.00147	-0.0125	0.0727*
	(0.0220)	(0.0528)	(0.0260)	(0.0458)	(0.0607)	(0.0404)	(0.0195)	(0.0116)	(0.0444)	(0.0412)
Shock	-0.00745	-0.00972	0.00987	0.0222	0.0134	-0.0530***	-0.0190***	-0.00651*	0.0667***	-0.0344
	(0.00864)	(0.0138)	(0.0100)	(0.0196)	(0.0203)	(0.0165)	(0.00716)	(0.00522)	(0.0239)	(0.0230)
Finliteracy	-0.00415	-0.00726	-0.00653	-0.0844***	-0.213***	0.0299*	-0.00701	-0.000785	0.0396*	0.139***
	(0.00976)	(0.0152)	(0.0102)	(0.0213)	(0.0224)	(0.0173)	(0.00743)	(0.00463)	(0.0239)	(0.0218)
capability	-0.0151*	-0.064***	0.0107	0.00166	-0.0345	-0.0343**	0.0112	-0.00240	0.0689***	-0.0192
	(0.00866)	(0.0156)	(0.0133)	(0.0232)	(0.0239)	(0.0174)	(0.00783)	(0.00465)	(0.0259)	(0.0249)
Observations	3,810	3,810	3,810	3,810	3,810	3,810	3,810	3,810	3,810	3,810

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1