working paper
CBMS-2020-08

Determinants of Financial Inclusion for Youth Entrepreneurs: Evidence from Addis Ababa City and Shirka Wereda, Ethiopia

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April 2020

pep partnership for economic policy
PAGE policy analysis on growth and employment
IDRC CRDI
UKaid

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Abstract

This study identified and examined the factors that affected the financial inclusion of young people in selected sites in Ethiopia using local-level data collected with a Community-Based Monitoring System approach. We collected data from 4,928 young respondents in Addis Ketema sub-city (in Addis Ababa) and in Gobesa Town and Mitana Gado (in Shirka Wereda). The study used binary logit analysis to examine factors that contributed to the financial inclusion of youth, a multinomial logistic regression to investigate the preferences of youth for financial providers, an ologit analysis to quantify the use of financial services, and propensity-score matching to examine the effect of financial inclusion on income. Our data showed that 65.32% of respondents had access to financial services, though more of these were young men than young women. Financial literacy, religion, repayment period, age, technology use, and access to informal sectors had varying impacts on the financial inclusion of young people. Based on these results, we recommend improving access to financial services through financial training, efforts to harmonize financial services with religion, the introduction of the latest technologies, and limitations on collateral requirements. Because of the disproportionate effect of gender on financial inclusion, programs that target young women will have a greater impact.

Keywords: Financial Inclusion, Entrepreneurship, Welfare, Unemployment.

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Acknowledgements

This research work was carried out with financial and scientific support from the Partnership for Economic Policy (PEP) (www.pep-net.org) with funding from the Department for International Development (DFID) of the United Kingdom (or UK Aid), and the Government of Canada through the International Development Research Center (IDRC). The authors are also grateful to Dr. Celia M. Reyes and Anne Bernadette Mandap for technical support and guidance, as well as to the CBMS resource persons for their valuable comments and suggestions. The authors' gratitude also goes to the CBMS International Network Research Team for their firm support in helping the team to succeed in doing the study.

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List of abbreviations

CBMS Community based monitoring system
MSEs Micro and small enterprises
MFI Micro Financial institutions
NGOs Non-governmental organizations

Executive summary

This study is designed to provide information that can be used by local officials and policy makers to identify obstacles to access to formal financial services that individuals (and youth in particular) face. In particular, this pilot study was intended to establish the major determinants of financial inclusion for youth entrepreneurship using data generated at the local level in three Ethiopia sites: Addis Ababa Subcity Wereda 10 (hereafter, Wereda 10), Shirka Wereda Gobesa Town (hereafter, Gobesa Town), and Mitana Gado in Shirka Wereda (hereafter, Mitana Gado). The study used primary data generated from a community-based monitoring system survey (Alemu, Mehari & Seyoum, 2018). In particular, basic data of the target youth population's individual characteristics such as age, gender, religion, income were drawn from the CBMS household profile questionnaire administered through a household census. Drawing from earlier literature reviews and studies of financial inclusion, we identified and adopted dependent and independent variables in conducting this study. Receipt of financial services and preferences for financial-service providers were considered factors that drove financial inclusion. Whether youth had received financial services (dependent variable) was related to whether or not young people's loan applications and other requests were accepted by the financial-service provider. The independent variables are determinants of whether young people's requests for financial services would be accepted or rejected by financial-service providers; including distance to FSP; availability of other loan sources (friends, *equb*, a rotating savings and credit service group, family, etc.); gender, age, and religion of those who saved in formal financial institutions; cost of capital (borrowing IR); repayment period; income; financial literacy; collateral; legal and regulatory restrictions; loan size; and use of technology for financial services. Some of these factors could also determine the preferences of youth for different financial-service providers among the most common sources in Ethiopia: banks, microfinance institutions, and savings and credit associations. We investigated whether these factors determined or were associated with young people's preferences for financial-service providers. We also attempted to measure the impact of financial inclusion (i.e., receiving financial services) on the welfare of youth who were micro- and small-business entrepreneurs. Hence, the dependent variable was the welfare of youth MSE entrepreneurs, and some dependent variables were taken as matching for the outcome variable (welfare) in the propensity-score matching model. Both descriptive and inferential statistics were adopted for this study. Frequency tables that showed actual CBMS census and addendum survey data and results for identified indicators were generated to support the analysis. Aside from descriptive methods of data analysis, we adopted advanced econometrics techniques of binary, multinomial, and ordinal logit regression to examine the relationship of the variables with reference to our specific research questions. These models examined the relationship among whether young people received financial services, their preferences for financial-service providers, and their level of participation in formal financial institutions. The study investigated the effect of financial inclusion on the welfare of youth using Propensity-Score Matching approach (psmatch2).

In the project sites, about 18,746 individuals and 5,106 households were covered by the census, though a larger number of households was expected prior to the implementation of the CBMS.

Among the total population at this site, 9,022 (48.11%) were men or boys, and 9,736 (51.89%) were women or girls. Individuals between 15 and 29 accounted for 4,928 (26.27%) of the population, of whom 2,138 (43.38%) were young men and 2,790 (56.62%) were young women. Among the total 4,928 youth in the three project areas,

1,709 (34.68%) had received financial services (financially included) from formal institutions in the twelve months preceding the census conversely, 3,219 (65.32%) had not. About 61.97% of youth had a low degree of financial inclusion with a slightly greater proportion of young women (63.34%) than young men (60.42%). Less than 1% of young men (0.37%) and of young women (0.55%) were highly financial included. About 39.21% of young men and 36.1% of young women were moderately financially included. Less than 5% of young people in all sites had their own businesses (3.32% in Wereda 10 and 4.81% in Gobesa Town). Among the three sites, the highest proportion of youth did not own a business was recorded in Mitana Gado at 98.2%. The study reveals that financial literacy had a positive and significant effect on whether a respondent actively saved money. This specific result implied that those who were financially literate had a greater probability of saving than did those who were financially illiterate. Our study showed that interest rate had a positive effect on the likelihood of financial inclusion among youth. Specifically, interest rate had a positive effect on remittances but not on the other dependent variables. We found that religion and culture contributed adversely to saving. Another factor known to have an influence on financial inclusion is the regulatory and legal environment. Our results revealed that this factor contributed positively to the financial inclusion of youth. The use of technology by youth had an effect on their access to finance. Financial inclusion first increases and then declines with age. As a result, older people are more likely to be financially included up to a certain age, after which the probability of being financially included diminished. High costs associated with using bank accounts, along with disclosure requirements and distance, reduce formal inclusion. Access to informal financial services had a positive effect on the likelihood that young people would have savings but not with respect to loans or remittances. In Ethiopia, a common savings platform is *equb*, a form of revolving-savings collective. On the basis of a lottery, individuals receive the money accumulated by the group. The *equb* method allows individuals either to spend for urgent consumption or accumulate and transfer funds to formal accounts until they reach a target savings level. The presence of such savings scheme contributed positively in our study toward formal financial saving. The study also reveals that financial inclusion had a maximum impact of 22,921.90 birr on the welfare (consumption) of youth. In other words, a young person who was financially included consumed 22,921.90 birr more than one who was not. Financial inclusion contributed 26,568.56 birr per annum to consumption by young women, and 21,806.93 birr to consumption by young men. Need-based financial training should be provided to older youth (25-29). Banks are more reliable and secure providers of financial services, and information outlets should deliver up-to-date and relevant financial information in order to encourage youth) to prefer the services of banks. Restraints on pledges of collateral should be modified and replaced by other security options. Promotion of entrepreneurship among rural women, improvement of financial literacy in rural areas, and mobile-money-transfer platforms should be adopted as a launch pad to financial inclusion.

1 Introduction

1.1 Context of the study

Unemployment is a major challenge in the everyday lives of modern youth. Despite recent improvements, underemployment, and unemployment remain significant in Ethiopia (Nayak, 2014). Analysis of data by age group has shown high unemployment among youth, and urban youth are particularly vulnerable to unemployment (the unemployment rate is 21.6% among urban youth and 3.1% in rural areas). The National Labor Force Survey (Central Statistical Agency, 2013) indicated that the unemployed population of Ethiopia was 1,981,165 (a rate of 4.5% among economically active individuals older than 10 years of age). The survey also showed an unemployment rate for men and women of 2.7% and 6.5%, respectively. The youth-unemployment rate in June 2013 was 6.8% (4.6% for young men and 9.1% for young women).

MSE are the heart of a productive employment system. In the United States, for example, businesses of this type generate 50% of total employment in the private sector and have represented more than 65% of new jobs over the past fifteen years (Rico-Garrido, Lacalle-Calderón & Pérez, 2012). Support for MSE has become a driving force in creating job opportunities, ensuring integration, and supporting self-employment for the unemployed workforce. The major challenge, however, is that one-third of MSE do not have access to financial services that would support their growth (Rico-Garrido, Lacalle-Calderón & Pérez, 2012).

The MSE Development Strategy, published in November 1997 by the Ethiopian Ministry of Trade and Industry outlined an approach to eliminating such challenges for MSE. The program provides information about establishing and expanding an MSE as well as such specific support as access to financing, promotion of partnerships, access to financing, markets, appropriate technology, information and advice, and strengthening of the private sector both institutionally and through infrastructure (Girma, 2015).

Financial inclusion is defined by Sarma (2012) as the activity of making access to financing to all members of the community easy, available, and usable. It is measured by the degree to which financial-service providers offer unlimited financial services such as deposits, loans, payment services, money transfers, and insurance at reasonable cost, and particularly to disadvantaged and low-income groups (Basavaraja, 2009).

Regulatory frameworks and policies that are both friendly to youth and protective of their rights are needed to increase financial inclusion. International, national, and local governmental institutions and NGOs should focus on youth entrepreneurship and the financial inclusion of young people to reduce unemployment and poverty and achieve inclusive and sustainable development.

The National Bank of Ethiopia (2017) stated that the overarching goals of the Ethiopian National Financial Inclusion Strategy (hereafter, NFIS), as expressed in Growth and Transformation Plans 2015-2016 to 2019-2020 include increasing domestic savings and jobs by fostering a vibrant productive sector in support of Ethiopia's transformation from an agricultural to a manufacturing-industrial economy. The targets of the NFIS, which were intended to be achieved by 2020, included increasing the proportion of adults who save money at regulated financial institution to 40%, increasing the proportion of adults with insurance policies to 5%, ensuring that 80% of adults live within a maximum of five kilometers of a formal financial-service provider, and increasing lending to micro and small enterprises to 15%.

Regardless of efforts made, evidence from the Global Findex 2012 database indicates that

youth make up a disproportionately large share of unbanked persons worldwide and 46% of youth aged 15-24 had an account at a formal financial institution, compared to 66% of adults (older than 24) (Demirgüç-Kunt & Klapper, 2012). Just 18% of youth reported having saved in the preceding year (compared to 30% of adults), and 5% reported having borrowed from formal institutions, compared to 12% of adults.

Zeru (2010) stated that more than two-thirds of the Ethiopian population had access to an informal finance provider such as *idir* (funeral-expense cooperatives) and *equb* (savings cooperatives). It is essential, then, to examine ways of integrating the formal financial system (and, especially, the money-lending system) with informal credit and saving organizations to increase access to financial services.

In Ethiopia alone, access continues to be a national issue: less than 8% of Ethiopians have a formal bank account. The percent of borrowers is even smaller. Microfinance institutions reached 14.5% of households, a tiny figure. Empirical evidence suggests that microfinance institutions are not in a position to guarantee access to financial services, to MSE, to those in rural areas, or to the urban poor.

This study is designed to provide information that can be used by local officials and policy makers to identify obstacles to access to formal financial services that individuals (and youth in particular) face. In particular, this pilot study was intended to establish the major determinants of financial inclusion for youth entrepreneurship using data generated at the local level in three Ethiopia sites: Addis Ababa Subcity Wereda 10 (hereafter, Wereda 10), Shirka Wereda Gobesa Town (hereafter, Gobesa Town), and Mitana Gado in Shirka Wereda (hereafter, Mitana Gado).

1.2 Research questions and objectives

1.2.1. Research questions

Main Research Question

Which factors of financial inclusion have an effect on whether young men and women receive financial services and determine their preferences for providers?

Specific Research Questions

1. What is the level of financial inclusion among young men and women in the study area?
2. What is the level of entrepreneurship among young men and women in the study area?
   What is impact of financial inclusion on the welfare of young men and young women?
3. Does involuntary financial exclusion exceed voluntary exclusion among young men and women in the study area?

1.2.2 Objective of the study

The general objective of this study was to identify determinants of financial inclusion for youth entrepreneurship.

Specific objectives of the study

- To explore levels of financial inclusion among young men and women in Wereda 10, Gobesa Town, and Mitana Gado.
- To explore the level of entrepreneurship among young men and women in Wereda 10, Gobesa Town, and Mitana Gado.
- To measure the impact of financial inclusion on the welfare of young men and young women in Wereda 10, Gobesa Town, and Mitana Gado.
- To compare the prevalence of involuntary and voluntary financial exclusion of young men and women in Wereda 10, Gobesa Town, and Mitana Gado
- To identify which factors of financial inclusion are significant determinants of whether young men and women in Wereda 10, Gobesa Town, and Mitana Gado receive financial services and to understand how these factors influence their preferences for financial-service providers.

1.2.3 Hypotheses

Hypothesis for the main research question
Involuntary factors (insufficient income, high risk, discrimination, lack of information, weak contact, price barriers caused by market imperfections, etc.) outweigh voluntary factors in determining the financial inclusion of both young men and young women.

Hypotheses for the other research questions:

H1: Financial inclusion is very low in the project areas.
H2: The level of entrepreneurship among young men and young women is low in the study area.
H3: The welfare of young men and young women who are financially included is better than the welfare of those who are financially excluded
H4: Involuntary factors (insufficient income, high risk, discrimination, lack of information, weak contact, price barriers caused by market imperfections, etc.) exceed voluntary factors in determining financial inclusion among young men and young women.

2 Literature review

2.1. Determinants of financial inclusion

Price and non-price factors in the use of financial services are associated with financial exclusion (Adeyemi, Pramanik & Meera, 2011). The presence of significant diversity of these factors among people; measurement of financial exclusion is a complex task. The World Bank Global Financial Development Report identified four main types of financial inclusion (whether involuntary or voluntary): no need for financial service, religion or culture, insufficient income

and discrimination, price barriers and lack of information (Amidžić, Massara & Mialou, 2014). Voluntary exclusion involves those individuals or firms that avoid using financial services because they do not want such services or for religious or cultural reasons. Because this type of exclusion is not a direct result of market failure, little effort is required to address it.

Financial exclusion is bound by absence of demand, considering the macroeconomic situation. Insufficient income and negative lending-risk profiles may cause some firms to be financially excluded involuntarily, another type of exclusion that is not an effect of market failure. A second group of involuntarily excluded entities is made up of individuals and firms that are denied financial services as a result of market imperfections or government failures (Amidžić, Massara & Mialou, 2014). The Amidžić group further stated that market imperfections were the main reason firms were involuntarily financial excluded. In another perspective, Gichuki, Njeru, and Tirimba (2014) observed that financial inclusion could be determined by factors such as collateral requirements, credit cost, availability of information on finance, and business risk.

Munyanyi (2014) explained an association among educational level, occupation, and income level. The higher the educational level, the higher the chances of getting a better paying job and, as a result, the better the chances of earning higher income. Surveys by different groups have indicated that financial exclusion is especially severe among women. Because the majority of women in rural areas are less educated, they are largely unemployed or employed in jobs that pay poorly; consequently their income is very low. A report by the African Development bank ("Financial Inclusion in Africa," 2013) showed that 4 out of 5 women lacked access to financing whereas the lack of access among men was 25%. This difference is more pronounced in rural areas where only one in ten women benefits from credit services to farmers; for agricultural credit services, the proportion is below 1%. The African Development Bank report also notes that considerable study has gone into attempts to identify the factors that prevent women's access to and use of financial products and services, including financial illiteracy, physical access, and social norms. Most of these problems fall under the broad categories of economic barriers (i.e., supply-side issues), sociocultural barriers, and unfavorable enabling environment.

Girma (2015) stated that more than 50% of all women entrepreneurs in Ethiopia face gender related problems in setting up new businesses and in operating or expanding existing businesses. Women are disadvantaged due to religion, culture, and tradition. For instance, many women encounter difficulties in receiving financing from both banks and informal networks. This could explain why urban women participate more in financial services. Because of lack of a regular income, rural women may not be interested in opening bank accounts because they may not be capable of sustaining the bank's regular charges. As a way of promoting women entrepreneurship and fostering financial inclusion (in line with the recommendations Valla, 2001), financial institutions should ease administrative procedures for women and revisit loan-eligibility criteria to include "softer" assessments.

According to Zwedu (2014) absence of physical access is the main reason for low financial inclusion in Ethiopia despite tremendous movement over the past decade. Raising the paid-up capital for commercial banks by 566% and microfinance institutions by 900%) the National Bank of Ethiopia issued regulations that limit the creation of new institutions in the financing sector. Moreover, though recent regulations demanding tighter loan policies may reduce the possibility of non-performing loans, they have aggravated lack of access to banks.

Financial-literacy, business, and vocational training aimed at reinforcing young people's

financial abilities and business skills have become a component of many kinds of programs and activities. While business training is still necessary for young people who plan to take out loans, government agencies, funders, and financial institutions increasingly view financial education (training in budgeting, savings, debt management, consumer-protection awareness, explanation of financial products, and information on types of financial providers, for example) as necessary to developing the financial capability of young people. In one randomized control trial conducted in Uganda, the interplay between savings by young people and financial education was examined to determine whether interventions acted as complements or substitutes. The finding was that financial literacy and savings independently increased the number of youth who saved in financial institutions. A Youth Invest study observed that the number of young people from 15-24 increased savings after receiving life-skills training and financial education.

Zeru (2010) found that the following were the main issues that kept small businesses from seeking financing:

- Loan covenants and information requirements;
- Collateral requirements;
- Available size of loan;
- Level of cost of financing; and
- Availability of other loan sources (friends, family, *equb*, etc.)

2.2. Youth unemployment, entrepreneurship, and financial inclusion

Entrepreneurship is seen as a way to reduce unemployment and, for both developing and developed countries, MSE are the major source of employment (International Labor Organization, 2014). For the purposes of survival, youth will engage in self-employment if the labor market does not offer them positions. A "necessity entrepreneur" assists in supporting the livelihood of youth whereas "opportunity entrepreneurs" are sources of jobs. According to United Nation's Industrial Development Organization, a study from Oxford University listed a number of reasons for the importance of promoting youth entrepreneurship:

- Entrepreneurship provides self-employment opportunities as well as employment opportunities for other youth.
- Entrepreneurship brings isolated or disregarded youth into the mainstream economic system and gives them a sense of meaning and belonging.
- Entrepreneurship helps avoid delinquency and socioeconomic problems arising from unemployment.
- Entrepreneurship changes the lives of young people, and enabling them to develop skills and experience is important.
- Entrepreneurship promotes the recovery of local communities by providing valuable goods and services;
- Entrepreneurship capitalizes on the fact that young entrepreneurs may be particularly adaptive to new trends and opportunities in the economy

Though there are limited studies on the causes of unemployment in Ethiopia, the problems that occur in European countries may simply be exacerbated in developing countries. For instance, the Analysis Minister of Employment and Social Security (2013-2016) in Spain noted that, in addition to conditions stemming from the economic situation, structural problems were the cause of an increase in youth unemployment. These included:

- High rate of school dropouts.
- Marked polarization in the labor market: some young people give up their studies (and, thus, possess few marketable skills) while others who are highly qualified are under-employed.
- Insufficient availability of medium-level vocational training.
- Poor employability among youth, especially regarding foreign language skills.
- High rate of temporary employment among young people.
- Involuntary temporary employment.
- High levels of undesired part-time employment (51% of young people).
- Individuals in part-time employment who want full-time jobs.
- Groups at risk of social exclusion have more difficulty in entering the labor market.
- The need to expand self-employment and entrepreneurial initiatives among young people.

Moreover, though many factors influence unemployment rates in Africa, the largest contributor is problems related to financing: collateral requirements; cost of credit; availability of information on finance; business risks, and the dependent variable, access to credit facilities by micro and small enterprises (Gichuki, Njeru & Tirimba, 2014).

A World Bank study (2012) noted that one of the major problems of MSE development in Ethiopia was financial access, and access to financing was listed as the most severe obstacle by entrepreneurs themselves.

A variety of studies have described the multidimensional problems of financial inclusion. According to Zwedu (2014) and Demirgüç-Kunt and Klapper (2012) in Sub-Saharan Africa, distance from FSP was the cause of financial exclusion for 20% of unbanked individuals. Zwedu added that the geographical inaccessibility of banks was worsened by National Bank of Ethiopia financial regulations that led to highly conservative loan policies. Amidžić, Massara, and Mialou (2014) indicated that financial exclusion could be voluntary—that is, a situation is which individuals, groups, or firms prefer not to seek financial services because of religion, culture, or lack of encouraging projects.

Munyanyi (2014) took another perspective on financial inclusion, stating that the use of technology, financial literacy, and gender led to financial inclusion. Our findings revealed that the implementation of financial services via mobile phone has been driven by the growing number of low-income earners who own cellular phones, pre-paid billing systems sensitive to users' incomes, and improving technology. Lack of financial literacy is a barrier to the proper use of financial services. In Africa, women entrepreneurs have limited access to land, finance, and education because of social exclusion. Lack of regular income could also reduce rural women's interest in opening bank accounts because they may not be able to sustain the bank's regular charges.

Moreover, Zeru (2010) indicated that the basic aspects that hinder ability of small businesses to use financial services include loan covenants and information requirements, collateral requirements, available size of loan, cost of financing, and availability of other loan sources(friends, family, *equb*, etc.). Mackie et al. (2015) also stated that, in Ethiopia, over two-thirds of the population has access to financial services from informal providers such as friends/relatives, money lenders, or the three widely used Ethiopia-specific informal financial

systems: *idir* (funeral-expense cooperatives), *equb* (savings cooperatives), and Meskel Aksiyon (meat-purchasing cooperatives for religious festivals).

2.3. Analytical framework

Drawing from earlier literature reviews and studies of financial inclusion, we identified and adopted dependent and independent variables in conducting this study. Receipt of financial services and preferences for financial-service providers were considered factors that drove financial inclusion.

Whether youth had received financial services (dependent variable) was related to whether or not young people's loan applications and other requests were accepted by the financial-service provider.

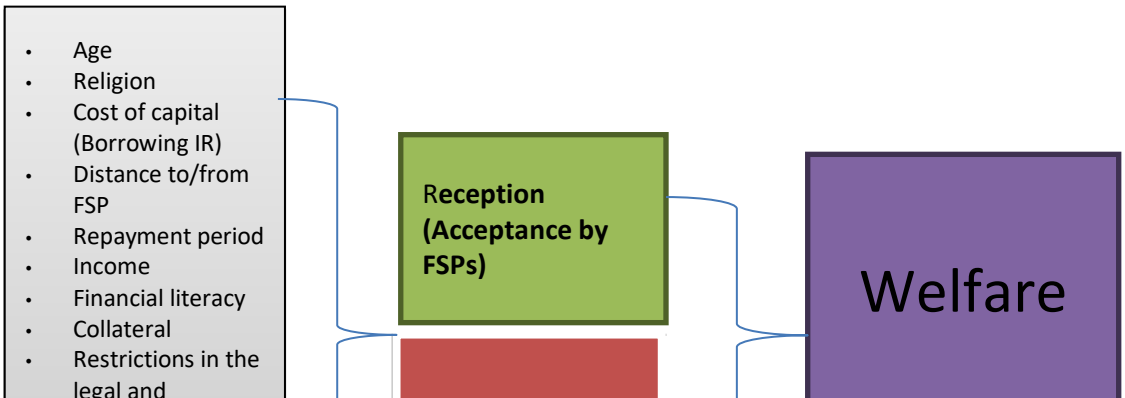
The factors listed in the first box of Figure 1 are independent variables (i.e., determinants of whether young people's requests for financial services would be accepted or rejected by financial-service providers), including distance to FSP; availability of other loan sources (friends, *equb*, a rotating savings and credit service group, family, etc.); gender, age, and religion of those who saved in formal financial institutions; cost of capital (borrowing IR); repayment period; income; financial literacy; collateral; legal and regulatory restrictions; loan size; and use of technology for financial services. Some of these factors could also determine the preferences of youth for different financial-service providers among the most common sources in Ethiopia: banks, microfinance institutions, and savings and credit associations.

We investigated whether these factors determined or were associated with young people's preferences for financial-service providers. We also attempted to measure the impact of financial inclusion (i.e., receiving financial services) on the welfare of youth who were micro- and small-business entrepreneurs. Hence, the dependent variable was the welfare of youth MSE entrepreneurs, and some dependent variables were taken as matching for the outcome variable (welfare) in the propensity-score matching model.

Accordingly, the following conceptual framework was designed for the project, and research questions were developed with a focus on these dependent and independent variables. Household- and individual-level data were gathered through a CBMS household census and addendum survey of targeted youth and were then used to explain and understand the interrelationships among the dependent and independent variables shown in the econometric models.

Moreover, the study intended to determine the level of financial inclusion of youth in the study area and to investigate the impact of financial inclusion on the welfare of youth who were micro- and small-business entrepreneurs. Welfare was measured in terms of income data collected through the household-profile and addendum questionnaires. CBMS data from the study site also generated information concerning variables that were used for matching treatment and control groups (e.g., age, gender, savings trends, and income).

Figure 1: Conceptual Framework of the Study



3 Methodology and data

3.1. Source of data

The study used primary data generated from a community-based monitoring system survey (Alemu, Mehari & Seyoum, 2018). In particular, basic data of the target youth population's individual characteristics such as age, gender, religion, income were drawn from the CBMS household profile questionnaire administered through a household census.

3.2. Variables of the analysis

Dependent Variables (DVs)
DV1: Whether youth received financial services (i.e., was financially included or excluded): binary logit
DV2: Youth preferences for financial-service providers: mlogit

The responses for this DV were:

(1) banks, (2) microfinance Institutions, (3) savings and credit associations, (4) local money lenders, and (5) Other.
Independent variables that affect the likelihood that youth will receive financial services or prefer specific types of financial-service providers:

A. Age
B. Religion
C. Cost of capital (borrowing IR)
D. Distance to FSP
E. Repayment period
F. Income
G. Financial literacy
H. Collateral
I. Regulatory and legal environment restrictions
J. Loan covenants and information requirements

K. Loan size
L. Availability of other loan sources (friends, *equb*, family, etc.)
M. FSP technology use

Both descriptive and inferential statistics were adopted for this study. Frequency tables that showed actual CBMS census and addendum survey data and results for identified indicators were generated to support the analysis. Aside from descriptive methods of data analysis, we adopted advanced econometrics techniques of binary, multinomial, and ordinal logit regression to examine the relationship of the variables with reference to our specific research questions. These models examined the relationship among whether young people received financial services, their preferences for financial-service providers, and their level of participation in formal financial institutions. The common types of lending institutions in Ethiopia are banks, microfinance, and savings and credit associations. The binary logit model provided the opportunity to identify the probability that respondents would participate in the financial market (i.e., receive financial services from formal financial institutions).

The logit/probit model is a model for binary response in which the response probability is the logit function or standard normal cumulative function used to measure the linear function of the independent variable (Wooldridge, 2013).

In the logit model, the probability of participation (receipt of financial services) can be defined as $P_i = \frac{e^z}{1+e^z}$ where Zi = , which is an estimated value of financial inclusion for observed individual, household, and community characteristics.

$$P_i = p(y = 1|x) = p(z_i \leq \beta x) = F(\beta x)$$

The logit as well as probit models are similar, though logit is flat at the top. In addition, the probabilities in logit approach 0 or 1 sluggishly as compared to probit. Considering these factors, we had no rationale other than simplicity for choosing the logit model (Gujarati, 2004), which we used to estimate the probability of participation or not based on apparent individual, household, and community characteristics. Conditionally, the study used the following binary choice model, which was helpful for identifying prospective factors that affected young people's preferences for the formal financial sector for loans.

$$\log(\frac{p_i}{1-p_i}) = \alpha + \beta I + \theta H + \delta C + e$$

where

α = Vector of coefficient of independent variation;
β = Vector coefficient of variables that indicate individual characteristics;
θ = Vector coefficient of variables that indicate household characteristics;
δ = Vector coefficient of variables that indicate community level characteristics;
Y- Whether or not the individual received a loan from legally established institutions (i.e., 1 = loan from legally established financial institution and 0 = loan from illegally established financial institution/source);
P_i= probability of Y=1;

I = Vector variables that indicate individual characteristics;
C = Vector variables that indicate community characteristics;
H = Vector variables that indicate household characteristics; and
e = Error term

Mlogit was used to identify the probability of the effect of the independent variables on youth entrepreneurs' preferences for financial-service providers. Accordingly, the dependent variable (preference for FSP among youth) was regressed against the observable explanatory variables (e.g., age of the business, collateral, loan size, income, etc.)

The mlogit for each non-reference category j = 1; C-1 against the reference category 0 depends on the values of the explanatory variables through:

$$\log \frac{\pi_i^{(j)}}{\pi_i^{(0)}} = \alpha^{\,j} + \beta_1^j x_1^i + \cdots \ldots \ldots \ldots + \beta_k^j x_{ki}$$

For each j = 1,……., C-1 where $\alpha^{\,j}$, β_1^j,…..,β_k^j are unknown population parameters

Pr (Y1 = y1,….,Yk = yk) = $\begin{cases} \frac{n!}{y_j!\ldots y_k!}\pi_1^{(0)} \ldots \ldots \pi_k^{(C-1)} \text{ when } \sum_{j-1}^{k} y_j = n \end{cases}$
and otherwise 0.

Response variables: Preferences for financial-service providers

Microfinance is the reference category, j =1;
banks are category j = 2;
Insurance companies are category j=3;
Saving and credit associations are category j=4; and
Financially excluded is category j=5
(Note that this codification is arbitrary)

Independent variables:
Cost of capital (borrowing IR), distance to FSP, repayment period, insufficient income, financial education, collateral, restrictions in the legal and regulatory environment, insufficient income, loan covenants and information requirements, availability of other loan sources (e.g., friends, *equb*, family, etc.), and technology use by FSP.

We also used an ordered logit model to determine the level of financial inclusion of youth in three different ways: savings, credit, and transfers of money through financial institutions. Thus the representation for this model would be:

$$y* = \beta 1x1 + \cdots + \beta kxk + e$$

Taking the three values, 0, 1, or 2, we then have

Y=0 if x'β =e $\leq \alpha_1$
Y=1 if $\alpha_1 \leq$ x'β +e $\leq \alpha_2$
Y=2 if $\alpha_2 \leq$ x'β +e

Thus:

y=0, if youth are engaged in one financial activity; either savings, credit, or transfer (low level of financial participation)

y=1, if youth are engaged in two of these financial activities (moderate level of financial participation)

y=2, if youth are engaged in all financial activities (high level of financial participation)

Gujarati (2004) stated that the variance of an estimator factor might be inflated if a multicollinearity existed. The existence of multicollinearity is explained by the Variance Inflation Factor (VIF) which is computed using $VIF_j = \frac{1}{1-R_j^2}$ where R_j^2 stands for coefficient of determination, which explains the percent of the variation in the variables explain the variation of the response variable. When the VIF increases with R_j^2, collinearity will increase. As Gujarati explained, and as rule of thumb, when R^2 is greater than 0.90, the VIF will be greater than 10. Hence the variables tend to be extremely multicollinear.

PROPENSITY-SCORE MATCHING (PSM)

The study investigated the effect of financial inclusion on the welfare of youth using Propensity-Score Matching approach (psmatch2). Using Propensity-Score Matching, we collected data and attempted to form groups based on respondents' exposure to formal financial institutions (considered a treatment factor) as well as monitor differences in their levels of consumption.

The Propensity-Score Matching impact-analysis tool we designed analyzed the average treatment effect (the use of formal financial services) on the treated (ATT) in the context of investigating the welfare of youth.

The procedure is as follows:

Step 1: We initially selected matching variables (i.e., treatment-independent variables), which helped to balance treatment and control groups and determine the number of blocks as well as a common support area.

Step 2: Then we computed pscores and balanced groups ready for matching and meanwhile determined the average effect of the treatment dependent variable (use of formal financial services). In this step, STATA set the total number of blocks.

Step 3: In this step, we chose a matching method. As is well known, four matching methods exist: nearest neighbor, radius matching, kernel matching, and stratification matching.

These procedures assisted in analyzing the effect of financial inclusion on the welfare of youth. Basically, the study measured the welfare of youth entrepreneurs based on their levels of consumption.

3.3. Project site and population

An addendum questionnaire, composed of sixty-two items, was developed for the purpose of

generating local-level data on determinants of financial inclusion and youth entrepreneurship. The addendum was administered by targeting one member, aged 15-29 years old, from households that included youth. In the event there was more than one youth in a household during data collection, priority was given to the youth with a business(es) and who participated in financial services.

4 Application and results

4.1. Project site profile

The study was conducted in three sites in Ethiopia with the following general demographic characteristics:

Table 1: Profile of Wereda 10, Gobesa Town and Mitana Gado

No	**Wereda**	**Total population size**	**Number of Households**	**No. of households covered by the core CBMS household census**
1.	Wereda 10	6,313	1,814	1,814
2.	Gobesa Town	9,742	2,677	2,677
3.	Mitana Gado	2,696	617	617

Source: 2018 CBMS Census, selected sites, Ethiopia.

4.2. Sample profile

Table 2: Profile of Youth Population

No	**Item**		**Young Men**	**Young Women**	**Total**
1.	Total Population		9,022	9,729	18,751
2.	Youth population		2,138	2,790	4,928
3.	Employed youth		983	774	1,757
4.	Youth with own business		110	85	195
5.	Youth having own savings account		702	771	1,473
6.	Youth made payment/transfer		417	457	874
7.	Youth with credit		9	11	20
8.	Young people's Religion	Protestant	71	94	165
		Orthodox	1,255	1,617	2,872
		Catholic	2	0	2
		Muslim	808	1,078	1,886
		Waaqeffataa	2	1	3

Source: 2018 CBMS Census, selected sites, Ethiopia.

We collected primary data with two questionnaires: a CBMS household profile questionnaire and an addendum questionnaire that collected individual-level data related to financial inclusion and entrepreneurship (Alemu, Mehari & Seyoum, 2018). For instance, data on such independent variables (determinants of financial inclusion) as distance, repayment period, and regulatory requirements were directly incorporated into the addendum as separate questions.

In the project sites, about 18,746 individuals and 5,106 households were covered by the census, though a larger number of households was expected prior to the implementation of the CBMS. The reduced number of households in the Wereda 10 site was a consequence of movement of the population to other areas in response to the transformation of the site into a business area in which business centers had been constructed in the place of dwellings. In Shirka Wereda, conversely, a high level of rural to urban migration had reduced the number of households.

Among the total population at this site, 9,022 (48.11%) were men or boys, and 9,736 (51.89%) were women or girls. Individuals between 15 and 29 accounted for 4,928 (26.27%) of the population, of whom 2,138 (43.38%) were young men and 2,790 (56.62%) were young women.

With regard to the employment status of youth who responded to the addendum questions, about 1,734 (37.33%) had held a job for the twelve months preceding the census while 2,911 (62.67%) of addendum respondents had been off the job for at least one month in the twelve months preceding the census. Nine hundred and sixty-nine employed youth were young men and 765 were young women; 1,839 of the unemployed were young men and 1,872 were young women.

4.3. Descriptive analysis

Table 3: Proportion of Youth Who Were Financially Included, by Gender

Financial inclusion	**Young Men**		**Young Women**		**Total**	
	Magnitude	**Proportion**	**Magnitude**	**Proportion**	**Magnitude**	**Proportion**
Access financial services	806	37.70	903	32.37	1,709	34.68
Without access to financial services	1,332	62.30	1,887	67.63	3,219	65.32
Total	2,138		2,790		4,928	

Source of basic data: 2018 CBMS Census, selected sites, Ethiopia.

Table 3 shows that, among the total 4,928 youth in the three project areas, 1,709 (34.68%) had received financial services from formal institutions in the twelve months preceding the census (i.e., were financially included); conversely, 3,219 (65.32%) had not. Within the context of this study, “financially included” means youth who receive savings services, credit services, or transfer money through a formal financial institution. Among young men, 806 (37.70%) were financially included in contrast to 903 (32.37%) young women. Those financially

excluded were 1,332, of which 62.30% were young men, and 67.63% were young women.

Table 4: Proportion of Youth Who Were Financially Included, by Project Site

Financial inclusion	**Wereda 10**		**Gobesa**		Mitana Gado	
	Magnitude	**Proportion**	**Magnitude**	**Proportion**	**Magnitude**	**Proportion**
Financially included	832	46.09	835	31.85	42	8.38
Financially excluded	973	53.91	1,787	68.15	459	91.62
Total	1,805	100	2,622	100	501	100

Source of basic data: 2018 CBMS Census, selected sites, Ethiopia.

Table 4 shows the financial inclusion of young people by project site. Accordingly, 832 (46.09%) of the youth population in Addis Wereda 10 were financially included, 835 (31.85%) in Gobesa Town were financially included, and 42 (8.38%) in Mitana Gado were financially included. Comparatively, 973 (53.91%) of youth in Wereda 10, 1,787 (68.15%) in Gobesa, and 459 (91.62%) in Mitana Gado were financially excluded.

Table 5: Access of Youth to Savings Accounts, by Sex

Access to saving	**Young men**		**Young women**		**Total**	
	Magnitude	**Proportion**	**Magnitude**	**Proportion**	**Magnitude**	**Proportion**
Have an account	702	32.83	771	27.63	1,473	29.89
Have no Account	1,436	67.17	2019	72.37	3,455	70.11
Total	2,138	100	2,790	100	4,928	100

Source of basic data: 2018 CBMS Census, selected sites, Ethiopia.

Access to savings accounts in formal financial institutions is one measure of financial inclusion, and Table 5 shows that 1,473 (29.89%) of youth in the three project sites had a savings account in a financial institution while 3,455 (70.11%) did not. Among the total of 2,138 young men, 702 (32.83%) had a savings account in a formal financial institution; the number was even smaller among young women (771 or 27.63%). The proportion of youth who had no savings account was 67.17% and 72.37% for young men and young women, respectively.

Table 6: Access of Youth to Credit, by Project Site

Access to credit	Wereda 10		Gobesa		Mitana Gado		Total	
	Magnitude	Proportion	Magnitude	Proportion	Magnitude	Proportion	Magnitude	Proportion
Received credit	13	0.72	7	0.27	0	0.00	20	0.41
Not Received credit	1,792	99.28	2,615	99.73	501	100.00	4,908	99.59
Total	1,805	100.00	2,622	100.00	501	100.00	4,928	100

Source of basic data: 2018 CBMS Census, selected sites, Ethiopia.

Table 6 shows the distribution of credit services received in the three project areas. Based on these data, no one in Mitana Gado had received credit services. A majority (13 out of 20) of credit services went to youth in Wereda 10; the remaining seven individuals were from Gobesa Town. This indicates that, though access to credit was very poor in all project sites, the lowest level of access was observed in rural areas.

Table 7: Access of Youth to Money-Transfer Facilities

Access to money transfer	Magnitude	Proportion (%)
Made money transfer	874	17.74
Not made money transfer	4,054	82.26
Total	4,928	

Source of basic data: 2018 CBMS Census, selected sites, Ethiopia.

Another indicator of financial inclusion is money transfers through formal financial institutions. In these project sites, 874 (17.74%) youth had made a money transfer in the twelve months preceding the census while 4,054 (82.26%) had not.

Table 8: Degree of Financial Inclusion, by Project Site

Degree of Financial	Wereda 10	Gobesa	Mitana Gado	Total

Inclusion	Magnitude	Proportion	Magnitude	Proportion	Magnitude	Proportion	Magnitude	Proportion
High financially inclusion	5	0.60	3	0.36	0	0.00	8	0.47
Moderate inclusion	231	27.76	401	48.02	10	23.81	642	37.57
Low financial inclusion	596	71.63	431	51.62	32	76.19	1,059	61.97
Total	832		835		42		1,709	

Source of basic data: 2018 CBMS Census, selected sites, Ethiopia.

CBMS data, as shown in Table 8, point out the degree of financial inclusion in the project sites. Thus, 5 (0.60%) in Addis Ketema Wereda 10, 3 (0.36%) in Gobesa Town and zero in Mitana Gado are of youth highly financially included, 231 (27.76%) in Wereda 10, 401 (48.02%) in Gobesa Town and 10 (23.81%) of them are moderately included and 596 (71.63%) in Wereda 10, 431 (51.62%) in Gobesa Town and 32 (76.19%) in Mitana Gado of them have low financial inclusion.

Table 9: Degree of Financial Inclusion, by Sex

Degree of Financial Inclusion	Young Men		Young Women		Total	
	Magnitude	Proportion	Magnitude	Proportion	Magnitude	Proportion
High financially inclusion	3	0.37	5	0.55	8	0.47
Moderate inclusion	316	39.21	326	36.10	642	37.57
Low financial inclusion	487	60.42	572	63.34	1,059	61.97
Total	806	100	903	100	1,709	100

Source of basic data: 2018 CBMS Census, selected sites, Ethiopia.

It is also investigated the degree of financial inclusion among young men and women. Based on this CBMS data, about 61.97% of youth had a low degree of financial inclusion with a slightly greater proportion of young women (63.34%) than young men (60.42%) (Table 9), Less than 1% of young men (0.37%) and of young women (0.55%) were highly financial included. About 39.21% of young men and 36.1% of young women were moderately financially included.

Table 10: Youth Ownership of Business, by Gender

Business ownership	**Young Men**		**Young Women**		**Total**	
	Magnitude	**Proportion**	**Magnitude**	**Proportion**	**Magnitude**	**Proportion**
Have own business	110	5.14	85	3.05	195	3.96
Do not own business	2028	94.86	2,705	96.95	4,733	96.04
Total	2138		2790		4,928	

Source of basic data: 2018 CBMS Census, selected sites, Ethiopia.

Table 10 shows the gender disaggregation of CBMS results regarding ownership of businesses: out of a total of 4,928 youth in the project sites, only 195 (3.96%) had their own businesses while 4,733 (96.04%) did not. Lack of financing was cited as the major reason for this by young women and young men alike: only 5.14% of young men and 3.05% of young women surveyed had their own businesses.

Table 11: Proportion of Youth Who Had Their Own Business, by Project Site

Business ownership	**Wereda 10**		**Gobesa**		**Mitana Gado**	
	Magnitude	**Proportion**	**Magnitude**	**Proportion**	**Magnitude**	**Proportion**
Have own business	60	3.32	126	4.81	9	1.80
Do not own business	1,745	96.68	2,496	95.19	492	98.20
Total	1,805		2,622		501	

Source of basic data: 2018 CBMS Census, selected sites, Ethiopia.

CBMS data also revealed the level of business ownership among young people across the three project sites (Table 11). Less than 5% of young people in all sites had their own businesses (3.32% in Wereda 10 and 4.81% in Gobesa Town). Among the three sites, the highest proportion of youth did not own a business was recorded in Mitana Gado at 98.2%.

Table 12: Reasons for Not Owning a Business

Business ownership	**Magnitude**	**Proportion**
No need	961	20.30

Lack of finance	2,321	49.04
Lack of working premise	281	5.94
Lack of business idea	510	10.78
Other	406	8.58
No stated reason	254	5.37
Total	4,733	

Source of basic data: 2018 CBMS Census, selected sites, Ethiopia.

Among youth who did not own a business, around half (49.04%) indicated that lack of access to financing was the main reason (Table 12). they had not started their own business, while about 20.30% said they had no need to own a business. Lack of ideas for business was third among the top reasons for not owning a business (10.78%). Other respondents (5.94%) mentioned having no premises or working area) for a business.

Table 13: Youth Employment Status, by Sex

Employment status	**Young Men**		**Young Women**		**Total**	
	Magnitude	**Proportion**	**Magnitude**	**Proportion**	**Magnitude**	**Proportion**
Employed	983	45.98	774	27.74	1,757	35.65
Unemployed	1155	54.02	2016	72.26	3171	64.35
Total	2,138	100	2,790	100	4,928	100

Source of basic data: 2018 CBMS Census, selected sites, Ethiopia.

Among all respondents, 1,757 (35.65%) of youth were employed, and 3,171 (64.35%) were unemployed. Of these, 983 young men (45.98%) and 774 young women (27.74%) were employed. CBMS data revealed a higher unemployment rate among young women than among young men: 1,155 or 54.02% vs 2,016 or 72.26%, respectively.

Table 14: Youth Employment Status, by Project Site

Employment Status	**Wereda 10**		**Gobesa**		**Mitana Gado**	
	Magnitude	**Proportion**	**Magnitude**	**Proportion**	**Magnitude**	**Proportion**
Employed	802	44.43	815	31.08	140	27.94
Not employed	1003	55.57	1,807	68.92	361	72.06
Total	1,805	100	2,622	100	501	100

Source of basic data: 2018 CBMS Census, selected sites, Ethiopia.

The CBMS data shown in Table 14 illustrate the employment situation among youth in the three project sites. Less than half of youth respondents were employed: only 802 (44.43%) in Wereda 10, 815 (31.08%) in Gobesa Town, and 140 (27.94%) in Mitana Gado. Unemployment was highest among youth in Mitano Gado (72.06%), followed by Gobesa Town (68.92%) and Wereda 10 (55.57%).

4.4 Econometrics analysis

We employed a logistic regression analysis that took financial inclusion as the dependent variable, and age, gender, collateral, and distance to the financial institution, loan size, use of technology, religion, financial literacy, and access to informal financial service providers as independent variables. The dependent variables were designated *save*, *remit*, and *loan*, and each had a discreet value of 0 or 1, indicating financially inclusion of exclusion. These values were extracted on the basis of these three items: savings, payments, and credit. An individual who had a savings account, for instance, was assumed to be financially included by that parameter. Similarly, we grouped respondents on the basis of money transfers and access to credit. In contrast, an individual who was involved in none of these financial services was assumed not to be financially included: 1 implied financial inclusion, and 0 represented being financially excluded.

We used the following dependent and independent variables:

A. **save**: Whether or not a respondent was financially included with specific regard to savings. The value ranged from 0 to 1—i.e., discrete values.

B. **remit**: Whether or not a respondent was financially included with specific regard to remittances. The value ranged from 0 to 1—i.e., discrete values.

C. **loan**: Whether or not a respondent was financially included with specific regard to credit involvement. The value ranged from 0 to 1—i.e., discrete values.

D. **age_yr**: The respondent's age. Financial inclusion likely changes with an individual's age.

E. **finlit**: An independent variable that assessed the financial literacy of youth in relation to interest rates and availability of financial services. The value of this variable was a dummy—i.e., 0 and 1.

F. **intdummy**: Cost of capital (that is, the interest rate), a factor that affected youth financial inclusion.

G. **reldummy**: Strength of adherence to religious or cultural beliefs. This was a dummy variable. If a respondent felt that religion and culture posed a challenge, the value of the variable was be 1, and otherwise 0.

H. **legdummy**: The regulatory and legal restrictions with regard to financial services. This was a dummy variable. If a respondent felt that the regulatory and legal environment posed a challenge, the value of the variable was be 1, and otherwise 0.

I. **rpdummy**: Repayment period, also called the due date or the time by which the borrower was expected to repay the loan.

J. **colldummy**: Availability of collateral which was crucial for approval of loans.

K. **covendummy**: Loan covenants and information requirements.

L. **lsdummy**: Loan size. Responses were affected by the size of loan.

M. **techudummy**: A financial-service provider's use of technology.

N. maledummy: Having hypothesized that gender would influence financial inclusion, we used maledummy as one independent (explanatory) variable.

O. Inforaccess: Informal access might affect the decision to be formally financially included.

Table 15: Logistic Regression Result for Covariates of Saving and Their Marginal Effects

Variable (label)	Overall		Young Women		Young Men	
	Financial Inclusion	Marginal effect	Financial Inclusion	Marginal effect	Financial Inclusion	Marginal effect
	Coefficient (Standard Error)					
Financial Literacy (finlit)*	0.66*** (0.08)	0.14*** (0.02)	0.66*** (0.11)	0.14*** (0.02)	0.66*** (0.12)	0.15*** (0.03)
Interest rate (intdummy)*	-0.10 (0.11)	-0.02 (0.02)	-0.08 (0.15)	-0.15 (0.03)	-0.11 (0.16)	-0.02 (0.03)
Religion and culture (reldummy)*	-0.92*** (0.23)	-0.15*** (0.03)	-0.77*** (0.27)	-0.12*** (0.03)	-1.14*** (0.39)	-0.19*** (0.05)
Regulatory and legal environment restrictions (legdummy)*	0.68*** (0.23)	0.15*** (0.06)	0.66* (0.35)	0.14* (0.08)	0.69** (0.33)	0.16** (0.08)
Loan covenants and information requirements (covendummy)*	-0.02 (0.16)	-0.004 (0.03)	-0.12 (0.21)	-0.02 (0.04)	0.14 (0.24)	0.03 (0.05)
FSP Technology use (techudummy)*	2.49*** (0.14)	0.55*** (0.02)	2.50*** (0.18)	0.55*** (0.03)	2.48*** (0.20)	0.55*** (0.03)
Gender (maledummy)*	0.08 (0.08)	0.02 (0.02)	NA	NA	NA	NA
Age (age)*	0.06*** (0.01)	0.01*** (0.002)	0.06*** (0.01)	0.01*** (0.002)	0.05*** (0.02)	0.01*** (0.004)
Distance to FSP (fininst_dist)	0.006*** (0.00)	0.001*** (0.00014)	0.007*** (0.001)	0.001*** (0.0002)	0.005*** (0.001)	0.001*** (0.0002)
Household per-capita income (PCI)	0.00 (0.00)	0.00 (0.00)	0.00003*** (0.000007)	0.000006*** (0.000)	0.000005 (0.0000)	0.000001 (0.000)
Availability of other loan sources (inforaccess)*	0.87** (0.35)	0.20** (0.09)	0.98** (0.44)	0.22** (0.11)	0.67 (0.58)	0.16 (0.15)
Constant	-2.70 (0.22)		-2.90 (0.26)		-2.48 (0.34)	
Number of observations = 4,928 (overall); young women = 2,790, young men = 2,138. *significant at 10% **significant at 5% *** significant at 1%.						
(*)dy/dx is for discrete change of dummy variable from 0 to 1						

Source of Basic Data: 2018 CBMS Census, selected sites, Ethiopia.

Tables 15, 16, and 17 indicate the effects of various independent variables on the financial inclusion of young people (with reference to savings, remittances, and loans). As Table 15 shows, financial literacy had a positive and significant effect on whether a respondent actively saved money. This specific result implied that those who were financially literate had a greater probability of saving than did those who were financially illiterate. This result was statistically significant at 1%.

Other studies support this finding. For, instance Beverly, Hilgert, and Hogarth (2003) found that the link between financial education (literacy) and household behavior was not only positive but significant. Similarly, Kihiu and Wachira (2012) in Kenya; Siddik, Sun, and Kabiraj (2015) in Bangladesh; and Abel (2018) in Zimbabwe showed a positive link between financial literacy and access to financial services.

The other variable that strong influences the financial inclusion of young people is interest rates. Our study showed that interest rate had a positive effect on the likelihood of financial inclusion among youth. Specifically, interest rate had a positive effect on remittances (see Table 15) but not on the other dependent variables.

Religion and culture were believed to affect the participation of people in financial services. Demirgüç-Kunt, Klapper, and Singer (2013), for example, used a sample of 65,000 adults from sixty-four economies. They found that Muslims resorted significantly less to formal account ownership and formal savings than did non-Muslims. Many banks, in consideration of the impact of this factor, have introduced different financial schemes, including interest-free banking. We found that religion and culture contributed adversely to saving (the effect was significant at 1%). They did not, however, have a have a significant effect on credit (loans) and remittances as shown in Tables 16 and 17, respectively.

Another factor known to have an influence on financial inclusion is the regulatory and legal environment. Our results revealed that this factor contributed positively to the financial inclusion of youth at a 1% level of significance.

The use of technology by youth had an effect on their access to finance. This is clearly shown in the binary output results in Tables 15 and 16, where the p-value is significant at 1%, and the sign of the respective coefficient is positive.

Zins and Weill (2016) found that being a woman significantly decreased the chance of owning an account in Africa. They also stated that being a woman increased informal savings while decreasing formal savings, in line with the view that African women resort more to informal than to formal finance. Using the 2012 Global Findex on ninety-eight developing countries, Demirgüç-Kunt, Klapper, and Randall (2013) found a significant gender gap in account ownership, formal savings, and formal credit, meaning that women had an increased likelihood of being financially excluded. Fungácová and Weill (2015) found the same result regarding gender and financial inclusion in China. Ducrotoy et al. (2017) in their study in Nigeria stated that the households of older women and individuals with lower-incomes had a reduced likelihood of being financially included. We found that almost all factors had a significant effect on the likelihood of having savings or making remittances for young women.

Based on the results shown in Table 15, finlit, reldummy, legdummy, techudummy, age, fininst_dist, PCI, and inforaccess had a significant effect on the possibility that young women would save in financial institutions. Similarly as shown in Table 16, intdummy, legdummy, techudummy, age, fininst_dist, and PCI had a significant effect on remittances.

Zins and Weill (2016) and Kihiu and Wachira (2012) noted that age had a nonlinear

(quadratic) relation with all three indicators of financial inclusion. Financial inclusion first increases and then declines with age. As a result, older people are more likely to be financially included up to a certain age, after which the probability of being financially included diminished. Because Ethiopian citizens younger than 18 are not allowed to receive financial services formally and independently, we made our age variable dichotomous: the first dummy (zero) referred to those younger than 18, and the second group (value = 1) was an age subgroup from 18-29. We found that youth in the second subgroup were more involved in savings and remittances than their younger counterparts.

Table 16: Logistic Regression Results for Covariates of Remittances and Their Marginal Effects

Variable (label)	**Overall**		**Young Women**		**Young Men**	
	Financial Inclusion	**Marginal effect**	**Financial Inclusion**	**Marginal effect**	**Financial Inclusion**	**Marginal effect**
	Coefficient (Standard error)					
Financial literacy (finlit)*	0.02 (0.10)	0.002 (0.01)	0.11 (0.13)	0.01 (0.02)	-0.003 (0.14)	-0.0004 (0.02)
Interest rate (intdummy)*	0.52*** (0.11)	0.08*** (0.02)	0.63*** (0.15)	0.09*** (0.03)	0.44 (0.16)	0.06 (0.02)
Religion and culture (reldummy)*	-0.08 (0.19)	-0.01 (0.02)	-0.21 (0.25)	-0.02 (0.03)	0.17 (0.29)	0.02 (0.04)
Regulatory and legal environment restrictions (legdummy)*	0.76*** (0.26)	0.13** (0.05)	0.98*** (0.33)	0.17** (0.07)	0.71 (0.39)	0.10 (0.07)
Loan covenants and information requirements (covendummy)*	-0.24 (0.20)	-0.03 (0.02)	-0.35 (0.28)	-0.04 (0.03)	0.14 (0.29)	0.02 (0.04)
FSP Technology use (techudummy)*	1.24*** (0.12)	0.22*** (0.03)	1.06*** (0.16)	0.18*** (0.03)	1.37 (0.15)	0.21 (0.03)
Gender (maledummy)*	0.11 (0.09)	0.02 (0.01)	NA	NA	NA	NA
Age (age)*	0.05*** (0.01)	0.007*** (0.002)	0.05*** (0.013)	0.007*** (0.002)	0.04 (0.01)	0.004 (0.002)
Distance to FSP (fininst_dist)	-0.01 (0.005)	-0.001 (0.00)	-0.004** (0.002)	-0.0005** (0.0002)	-0.09 (0.02)	-0.01 (0.0012)
Household Per capita Income (PCI)	0.00 (0.00)	0.00 (0.00)	**0.00002*** (0.000005)**	0.000002*** (0.000)	0.000001 (0.000002)	0.0000002 (0.000)
Availability of other loan sources (inforaccess)*	0.22 (0.38)	0.03 0.06	0.60 (0.47)	0.09 (0.09)	-0.53 (0.67)	-0.05 (0.05)
Constant	-2.96 (0.24)	NA	-3.13 (0.30)	NA	-2.32 (0.31)	NA
Number of observations = 4,928 (overall); young women = 2,790, young men = 2,138.						

*significant at 10% **significant at 5% *** significant at 1%.
(*) dy/dx is for discrete change of dummy variable from 0 to 1

Source of basic data: 2018 CBMS Census, selected sites, Ethiopia.

High costs associated with using bank accounts, along with disclosure requirements and distance, reduce formal inclusion. Trust of the banking sector can also have an influence. Kihiu and Wachira (2012) showed that distance from a financial-service provider posed a significant challenge to access to formal financial services. Households have been observed to shift their preference for formal and semi-formal financial services toward informal services as a result. Our results, conversely, revealed that distance to FSP had a positive effect on whether young people had savings but not on their use of remittances, implying that those who were farther away from FSP were highly involved in saving at the 1% level of significance. This result could be justified by the prevalence of agent banking and mobile banking options such as M-BIRR.

Zins and Weill (2016) found that greater income was associated with higher financial inclusion. We found, conversely, that income had no significant relationship with overall financial inclusion of young people (savings, remittances, and loans), except in the case of young women, for whom the impact on the likelihood of being financially included was significant and positive.

Access to informal financial services had a positive effect on the likelihood that young people would have savings (at a 5% level of significance) but not with respect to loans or remittances. In Ethiopia, a common savings platform is *equb*, a form of revolving-savings collective. On the basis of a lottery, individuals receive the money accumulated by the group. The *equb* method allows individuals either to spend for urgent consumption or accumulate and transfer funds to formal accounts until they reach a target savings level. The presence of such savings scheme contributed positively in our study toward formal financial savings (5% level of significance).

With the revised regression output separately regressed for savings and remittances, we removed repayment period and collateral from the factor variables, though they were included in the IV probit (Table 17) were DV was loans.

Loan covenants and financial information made no contribution to the likelihood that young men or young women) would be financial included because the p-value was not significance at 10%.

Table 17: IV probit Regression Result for Covariates of Loan and Their Marginal Effects

Variable (label)	**Overall**		**Young Women**		**Young Men**	
	Financial Inclusion	**Marginal effect**	**Financial Inclusion**	**Marginal effect**	**Financial Inclusion**	**Marginal effect**
	Coefficient (Standard error)					
Interest rate (intdummy)*	-3.08*** (0.22)	-3.08*** (0.22)	-3.08*** (0.32)	-3.08*** (0.32)	-3.07*** (0.65)	-3.07*** (0.65)
Financial literacy (finlit)*	-0.015 (.41)	-0.015 (0.41)	-0.03 (0.55)	-0.03 (0.55)	0.01 (1.06)	0.01 (1.06)
FSP technology use (techudummy)*	0.06 (0.12)	0.06 (0.12)	0.11 (0.32)	0.11 (0.32)	0.01 (0.07)	0.01 (0.07)
Gender (maledummy)*	-0.004 (0.03)	-0.004 (0.03)	NA	NA	NA	NA
Age (age)*	0.014 (0.01)	0.014 (0.01)	0.006 (0.03)	0.006 (0.03)	0.02 (0.02)	0.02 (0.02)
Distance to FSP (fininst_dist)	-0.0007 (0.03)	-0.0007 (0.03)	-0.002 (0.08)	-0.002 (0.08)	-0.001 (0.07)	0.001
Household per-capita income (PCI)	-0.0000003 (0.0000006)	-0.0000003 (0.00000)	-0.000001 (0.000007)	-0.000001 (0.00001)	-0.0000008 (0.00001)	-0.0000008 (0.00001)
Constant	-0.17 (2.14)	NA	0.007 (3.30)	NA	-0.42 (4.92)	NA
Number of observations = 4,928 (overall); young women = 2,790, young men = 2,138. *significant at 10% **significant at 5% *** significant at 1%						
Instrumented: intdummy *Instruments: finlit, techudummy, maledummy, age, fininst_dist, hhincome, reldummy*						
Wald test of exogeneity (corr = 0): chi2 (1) = 0.15 Prob > chi2 = 0.6950 (overall) *Wald test of exogeneity (corr = 0): chi2 (1) = 0.07 Prob > chi2 = 0.7976 (young women)* *Wald test of exogeneity (corr = 0): chi2 (1) = 0.03 Prob > chi2 = 0.8556 (young men)*						
(*) dy/dx is for discrete change of dummy variable from 0 to 1						

Source of basic data: 2018 CBMS Census, selected sites, Ethiopia.

4.4.1 Marginal effect of the binary logit estimations

William (2018) noted that marginal effects are computed differently for discrete (i.e. categorical) and continuous variables. With binary independent variables, marginal effects measure discrete change—that is, how predicted probabilities change as the binary independent variable changes from 0 to 1.

Table 16 shows that, when interest rates were high, young people's use of remittances increased by 8% (statistically significant at 1%).

As Table 16 demonstrates, being financially literate or having financial knowledge increased saving by 14% (statistically significant at the 1% level).

Table 15 also shows that those who adhere rigorously to religious and cultural beliefs have a 15% lower probability of having savings than those who do not (statistically significant at 1%). Similarly, when the regulatory or legal environment changes from flexible to strict and rigid, the likelihood of having savings increases by 15% (statistically significant at the 5% level). As FSP shift from being non technology users to technology users, the probability that young people will have savings and make remittances increases by 56% and 23%, respectively (both statistically significant at 1%).

Table 15 and Table 16 explain being between the ages of 18-29 increases the chance of having savings or making remittances by 1% and 0.7%, respectively (both significant at 1%).

Availability of and access to informal financial-service providers contributes positively to the probability that young people will have savings, but not to the likelihood that they will make remittances. As Table 15 demonstrates, youth who lack access to informal FSP are 21% more likely to save in a formal institution than those who have such access (significant at 5%).

Loan size, repayment period, and collateral requirements were not included in the savings and remittances regressions, nor were their marginal effect generated.

4.4.2 Post estimation test

As a post-estimation test, we checked the presence of multicollinearity. Table 18 shows the variance inflation factor (VIF), which quantifies the extent of correlation between one predictor and the other predictors in a model (Bock, n.d.).

The mathematical formula of the VIF is: $VIF = \frac{1}{1-R^2}$

In the table, values of both VIF and tolerance are reported. The mathematical formula for tolerance is:

$$1 - R^2 = \frac{1}{VIF}.$$

where

R^2-Correlation coefficient.

Table 18: Variance Inflation Factor Result

Variable	***VIF***	***1/VIF***
Age	2.39	0.42
Maledummy	1.75	0.57

Finlit	1.45	0.69
Intdummy	1.18	0.85
Techudummy	1.26	0.79
Covendummy	1.08	0.92
Fininst_dist	1.08	0.92
Legdummy	1.06	0.95
Reldummy	1.05	0.95
PCI	1.10	0.91
Inforaccess	1.01	0.99
Mean VIF	**1.31**	

Source of basic data: 2018 CBMS Census, selected sites, Ethiopia.

A value of 1 means that the predictor was not correlated with other variables. The higher the value, the greater the correlation of the variable with other variables. Values of more than 4 or 5 are sometimes regarded as being moderate to high, with values of 10 or more being regarded as very high (Bock, n.d.). The mean VIF for this estimation, as shown in Table 18, was 1.31, quite a bit lower than 4 or 5. Hence, there was no issue of multicollinearity in the model.

4.4.3. Multinomial logistic regression result

This study used multinomial logit analysis to identify the preferences of young people for financial-service providers, which could identify factors relevant to decision-making and customer-targeting for FSP.

In this analysis, independent variables similar to those used in the binary choice model were used, but the dependent variable we used was types of financial-service providers (types of financial institutions). The values of the dependent variable were: ***banks (1), microfinance institutions (2), saving and credit associations (3), local money lenders (4), and informal institutions (such as equb/idir) (5).***

Table 19: Multinomial Logistic Regression Result for Covariates of FSP

Variable description	**FSP Preference**
	Coefficient (Standard error)
Banks (base outcome)	
MFI	
Financial literacy (finlit)	-1.10** (0.48)
Interest rate (intdummy)	-0.87 (0.70)
Religion and culture (reldummy)	-16.3 (2880)
Regulatory and legal environment restrictions (legdummy)	-15.4 (2882)
Repayment period (rpdummy)	1.24** (0.59)
Collateral (colldummy)	0.16 (0.66)
Loan covenants and information requirements (covendummy)	-15.8 (2228)
Loan size (lsdummy)	0.84 (1.12)
FSP Technology use (techudummy)	1.23*** (0.38)
Gender (maledummy)	0.15 (0.36)

Age (age)	-0.052 (0.046)
Distance to FSP (fininst_dist)	-0.004 (0.008)
Household per capita income (PCI)	-0.00003 (0.00)
Availability of other loan sources (inforaccess)	-16.9 (4586)
Constant	-2.65 (1.01)
*significant at 10% **significant at 5% *** significant at 1%	
Number of observations = 1,709	

Source of basic data: 2018 CBMS Census, selected sites, Ethiopia.

Table 20: Multinomial Logistic Regression Result for Covariates of FSP

Variable description	**FSP Preference**
	Coefficient (Standard error)
banks (Base outcome)	
Saving and Credit Association	
Financial literacy (finlit)	0.41 (0.59)
Interest rate (intdummy)	-15.9 (1785)
Religion and culture (reldummy)	-15.05 (3631)
Regulatory and legal environment restrictions (legdummy)	-14.9 (4069)
Repayment Period (rpdummy)	0.96 (1.11)
Collateral (colldummy)	1.03 (0.82)
Loan covenants and information requirements (covendummy)	-15.85 (3396)
Loan size (lsdummy)	-17.3 (12970)
FSP Technology use (techudummy)	0.95* (0.59)
Gender (maledummy)	-0.008 (0.55)
Age (age)	-0.05 (0.07)
Distance to FSP (fininst_dist)	-0.36 (0.35)
Household per capita income (PCI)	0.00 (0.00)
Availability of other loan sources (inforaccess)	-16.3 (6448)

Constant	-3.60 (1.61)
*significant at 10% **significant at 5% *** significant at 1% Number of observations = 1,709.	

Source of basic data: 2018 CBMS Census, selected sites, Ethiopia.

Table 21: Multinomial Logistic Regression Result for Covariates of FSP

Variable description	**FSP Preference**
	Coefficient (Standard error)
Banks (Base outcome)	
Local Money Lenders	
Financial literacy (finlit)	-0.82 (0.84)
Interest rate (intdummy)	0.15 (1.10)
Religion and culture (reldummy)	1.34 (1.11)
Regulatory and legal environment restrictions (legdummy)	-15.6 (5798)
Repayment Period (rpdummy)	-15.6 (2764)
Collateral (colldummy)	-15.8 (3238)
Loan covenants and information requirements (covendummy)	-15.3 (3864)
Loan size (lsdummy)	-15.8 (13520)
FSP Technology use (techudummy)	0.67 (0.69)
Gender (maledummy)	0.50 (0.66)
Age (age)	-0.04 (0.08)
Distance to FSP (fininst_dist)	-0.05 (0.08)
Household per capita income (PCI)	0.00 (0.00)
Availability of other loan sources (inforaccess)	-15.6 (8543)
Constant	-4.21 (1.87)

*significant at 10% **significant at 5% *** significant at 1% Number of observations = 1,709.

Source of basic data: 2018 CBMS Census, selected sites, Ethiopia.

Table 22: Multinomial Logistic Regression Result for Covariates of FSP

Variable description	**FSP Preference**
	Coefficient (Standard error)
Banks (Base outcome)	
Informal institutions (Like *equb*/*idir*)	
Financial literacy (finlit)	-1.43* (0.77)
Interest rate (intdummy)	0.84 (0.52)
Religion and culture (reldummy)	1.02 (0.78)
Regulatory and legal environment restrictions (legdummy)	0.71 (1.10)
Repayment period (rpdummy)	-0.77 (0.81)
Collateral (colldummy)	0.20 (0.71)
Loan covenants and information requirements (covendummy)	1.23 (0.81)
Loan size (lsdummy)	1.70 (1.17)
FSP Technology use (techudummy)	-0.47 (0.65)
Gender (maledummy)	0.07 (0.44)
Age (age)	-0.08 (0.06)
Distance to FSP (fininst_dist)	-0.11 (0.11)
Household Income (hhincome)	-0.00003* (0.0000)
Availability of other loan sources (inforaccess)	-16 (4839)
Constant	-2.12 (1.21)
*significant at 10% **significant at 5% *** significant at 1%. Number of observations = 1,709.	

Source of basic data: 2018 CBMS Census, selected sites, Ethiopia.

As described in Table 19, the reference variable independent of the multinomial logistic regression was banks. All interpretations were therefore made on respondents' preferences for toward banks. As illustrated in Table 19, the independent variables finit, rpdummy, and techudummy were statistically significant. The findings shown in Table 19 specifically imply that youth who were financially literate or had financial information preferred banks to microfinance institutions (MFIs) at a 5% level of significance.

Our results indicated that as constraints or pressure regarding the length of the repayment period escalated, youth preferred to use MFI rather than banks at a 5% level of significance. Similarly, youth tended to choose MFI as they adopted the use of technology (significant at 1%).

Table 20 shows the results of the multinomial logit analysis in which we tried to reveal the preferences of youth regarding toward savings and credit associations (SACAs) in relation to banks. Accordingly, out of the fourteen variables used in the analysis, only one had a significant effect. Table 20 shows that, as technology use was adopted in the financial market, youth

preferred to use SACAs rather than banks (significant at 10%).

The third face of the multinomial logistic regression investigated the preferences of youth for Local Money Lenders with respect to banks. Table 21 shows that none of the fourteen variables significantly explained the preferences of youth.

Finally, in Table 22 indicates the presence or absence of significant effects derived from a variables related to the choices of young people for informal FSP. Those who had good financial literacy preferred to receive financial services from banks than informal FSP at a 10% level of significance. Similarly, those whose incomes were large preferred to use banks rather than informal financial institution (10% of significance).

4.4.4. **Ordered logistic regression result**

Our study attempted to associate various explanatory variables to financial inclusion as well as determine the factors that contributed significantly toward respondents' choices of financial-service providers. Even among those who are financially included, the use of those financial services might vary.

Here, we describe our efforts to assess the relationship between the explanatory variables and the dependent variable (*degruse*). *Degruse* represented the degree of use of financial services, which was subdivided into high users, mild users, and low users. This classification was based on the following three points: owning a bank account, using payment/transfer services, and using credit services. Those who used only one of these three items were assumed to be low users, those who used two of the three services were termed mild users, and those who used all the services were considered high users of financial services.

Table 23: Ordered Logistic Regression Result for Covariates of Degree of Use of Financial Services

Variable (label)	**Overall**		**Young Women**		**Young Men**	
	Financial Inclusion	**Marginal effect**	**Financial Inclusion**	**Marginal effect**	**Financial Inclusion**	**Marginal effect**
	Coefficient (Standard error)					
Financial literacy (finlit)*	0.10 (0.11)	-0.02 (0.03)	0.26 (0.16)	-0.06 (0.04)	0.11 (0.17)	-0.02 (0.03)
Interest rate (intdummy)*	-0.002 (0.16)	-0.0004 (0.04)	0.12 (0.22)	-0.03 (0.05)	0.11 (0.25)	-0.02 (0.05)
Religion and culture (reldummy)*	-0.64** (0.31)	0.14** (0.06)	-0.45 (0.40)	0.10 (0.08)	-0.79 (0.48)	0.11** (0.06)
Regulatory and legal environment restrictions (legdummy)*	0.71** (0.31)	-0.17** (0.08)	1.16*** (0.44)	-0.28*** (0.10)	0.81* (0.49)	-0.17 (0.12)
Repayment Period (rpdummy)*	-0.62*** (0.22)	0.13*** (0.04)	-0.81** (0.32)	0.16*** (0.06)	-0.55* (0.32)	0.09** (0.04)
Collateral (colldummy)*	0.32* (0.19)	-0.08 (0.05)	0.25 (0.26)	-0.06 (0.06)	0.33 (0.27)	-0.06 (0.06)
Loan covenants and information	0.22 (0.25)	-0.05 (0.06)	0.40 (0.38)	-0.10 (0.09)	0.32 (0.35)	-0.06 (0.07)

requirements (covendummy)*						
Loan size (lsdummy)*	-0.37 (0.56)	0.08 (0.12)	-0.50 (0.77)	0.11 (0.15)	-0.57 (0.86)	0.09 (0.11)
FSP Technology use (techudummy)*	0.32*** (0.12)	-0.08*** (0.03)	0.14 (0.17)	-0.03 (0.04)	0.53*** (0.17)	-0.10*** (0.03)
Gender (maledummy)*	0.07 (0.10)	-0.02 (0.02)	NA	NA	NA	NA
Age (age)	-0.02 (0.01)	0.004 (0.003)	-0.003 (0.02)	0.0006 (0.004)	-0.04* (0.02)	0.01* (0.003)
Distance to FSP (fininst_dist)	-0.005*** (0.002)	0.001*** (0.0004)	-0.004** (0.002)	0.0009** (0.0004)	-0.08*** (0.02)	0.01*** (0.002)
Household per capita income (PCI)	0.000006*** (0.000003)	- 0.000001** (0.00)	0.000009* (0.000005)	- 0.000002* (0.000)	0.000005 (0.000004)	- 0.0000009 (0.0000)
Availability of other loan sources (inforaccess)*	0.32 (0.43)	-0.08 (0.11)	0.66 (0.54)	-0.16 (0.13)	-0.22 (0.75)	0.04 (0.12)
/cut1	0.30 (0.30)	NA	0.67 (0.42)	NA	-0.39 (0.43)	NA
/cut2	5.21 (0.46)	NA	5.36 (0.61)	NA	4.88 (0.71)	NA
Number of observations = 1,709; young women = 903, young men = 806. *significant at 10% **significant at 5% *** significant at 1%.						
Marginal effects after ologit y = Pr (degruse = 1) (predict) = .62696355. *(*) dy/dx is for discrete change of dummy variable from 0 to 1*						

Source of basic data: 2018 CBMS Census, selected sites, Ethiopia.

The "Overall" section in Table 23 shows that, of the total explanatory variables, only seven were statistically significant and, therefore, suitable for interpretation: reldummy, legdummy, rpdummy, colldummy, techudummy, fininst_dist, and PCI. Adherence to culture and religion places young people in the lower range of use of financial services. In other words, youth who are rigid and dogmatic are probably low users of financial services because most formal banking services are believed to be "anti-religious." Strain in the legal and regulatory environment tends to place youth in the upper category of degree of use, which was statistically significant at 5%. Strain in the repayment period increases the chance that youth will be in the lower category of use of financial services (significant at the 1% level).

The rest of the explanatory variables (finlit, intdummy, covendummy, lsdummy, maledummy, age, and in for access) had no significant effect on degree of use of financial services.

Young women were likely to be high users of financial services as the legal and regulatory environment improved, though both strain on loan repayment period and increased distance to FSP lowered their use of financial services.

The study determined that five out of the list of the factors significantly affected the degree of financial inclusion of young men: legdummy, rpdummy, techudummy, age, and fininst_dist.

4.4.5. Propensity score matching result

In this study, effort has been made to identify the impact of financial inclusion on the household consumption of youth, identified by the variable consumpt.

The treatment factor that we used to segregate and form treatment and comparison groups was finclude, which showed the financial inclusion status of young people as a value of either 0 or 1 (financially included or financially excluded). As a background matching variable, we tried to match using income, age, sex, literacy, educational level, marital status, family size, disability status, religion, and training. However the only valid matching variables appropriately matching the groups were: ***age, sex, literacy, and educational level***.

The model is presented below:

$$ATT = \frac{1}{N_T}(\sum_{1}^{N_T}(Y_T - Y_C)$$

where Yt is the outcome of the treated group, Yc is the outcome of the comparison group, Nt is the matched sample, and ATT is the average treatment effect on the treated.

4.4.5.1 Descriptive statistics of covariates and of treatment and outcome variables before matching

The total number of observations, as indicated in Table 24, was 4,928. Of these, 65% were treated (were financially included), and 35% were in a comparison group (not financially included).

Table 24: Outcome Variables, Matching Variables, and Total Observation

Matching variables	**Category**	**Before Matching**	
		Treatment Group	**Comparison Group**
Outcome variable			
Consumption (in ETB) Outcome variable		59274.99	44630.27
Treatment independent variables (matching variable)			
Age (in years)		22.80	21.01
Gender (in number)	Young men	806	1,332
	Young women	903	1,887
Literacy (in number)	Literate	535	1,262
	Illiterate	1,174	1,957
Education Level	Primary	94	402
	Secondary	269	714
	Tertiary	190	182
	Informal	1,156	1,921
Observations (in number). (Note: this is not aggregate result.)		3,219	1,709

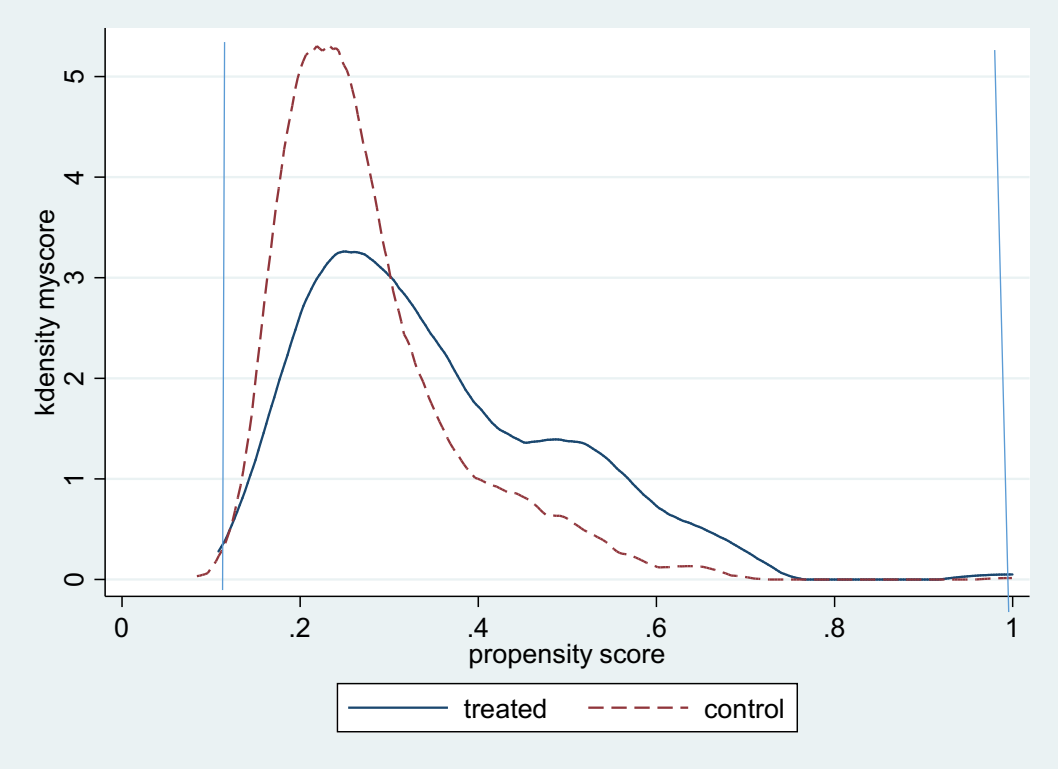
Source of basic data: 2018 CBMS Census, selected sites, Ethiopia.

Most of the treatment independent variables used to match treatment and comparison groups showed no match between the groups, though the age variable was an exception. As the Table indicates, the average age of the treatment group (22.80) was approximately equivalent to the average age of the comparison group (21.01). Given that, identifying the impact of the treatment factor was not appropriate and it became important instead to use appropriate statistical approaches and to determine common support.

4.4.5.2 Common Support (Kernel Density and Psgraph)

To ensure good matching between the comparison and treatment groups, common support was generated as n a kernel density and psgraph:

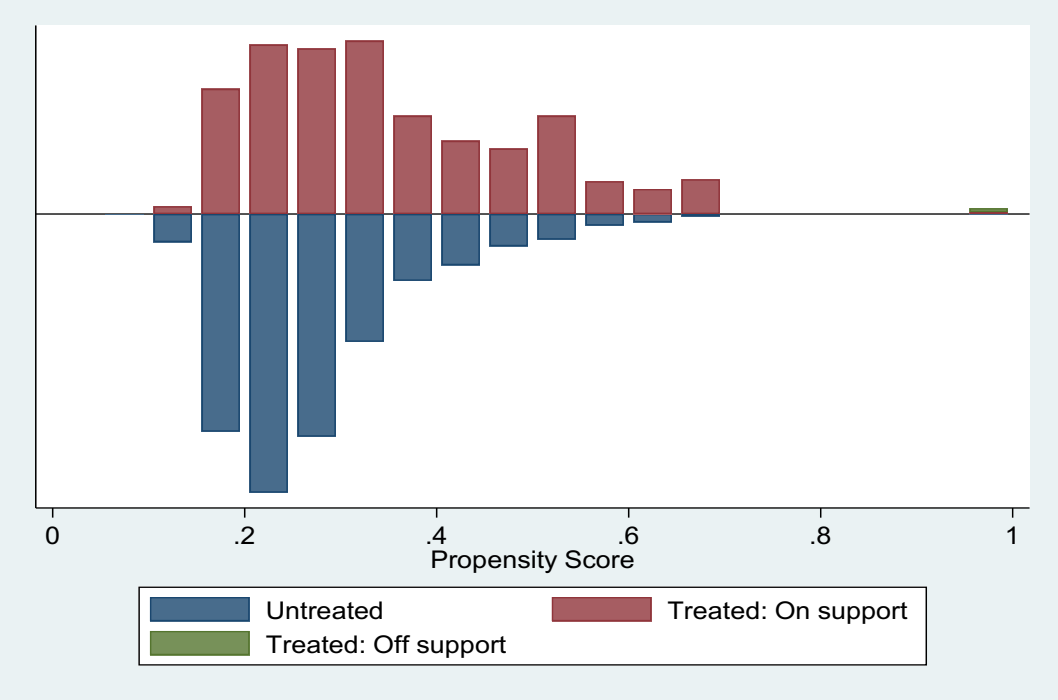
Figure 2: Kernel Density of Common Support



Source of basic data: 2018 CBMS Census, selected sites, Ethiopia.

The kernel density graph indicates that common support ranged from 0.11 to 0.99. Thus, observations below 0.11 or above 0.99 were assumed to be not in a range of common support. For instance, though there were comparison group observations below the score of 0.11, there was no treatment group with which to match them.

Figure 3: Psgraph of Matched Observation



Source of basic data: 2018 CBMS Census, selected sites, Ethiopia.

Similarly, as with kernel density, the psgraph in Figure 2 shows that the common support area ranged between 0.11 and 0.99. The off-support area begins with scores near 1. The graph confirms that, for all treatment groups, there were matching comparison-group observations.

4.4.5.3 Matching Results and Post Matching

The probit estimation shown in in Table 25 indicates that all treatment independent variables (matching variables), except gender, had a strong influence on the possibility of being treated

Table 25: Probit Regression of Covariates against Treatment Status

Variable	Coefficient	Standard Err
Age (in years)	0.07***	.01
Gender	-0.04	0.06
Literacy	-0.32*	0.18
Education Level	0.04***	0.01
Constant	-1.94***	0.25
Observations = 1,868. Prob > chi2 = 0.0000. *significant at 10% **significant at 5% *** significant at 1%.		

Source of basic data: 2018 CBMS Census, selected sites, Ethiopia.

Table 26: Effect of Being Treated (Financially Included) on Consumption

Overall (Both Young Men and Young Women)					
Variable	**Status**	**Treated**	**Controls**	**Difference**	**T-stat**
Consumption	Unmatched	78513.9	55764.55	22749.35***	4.98

(in ETB)	ATT	78727.48	55805.6	22,921.9**	2.32
Young women only					
Consumption (in ETB)	Unmatched	84973.5	52990.0	31983.4***	5.31
	ATT	85442.9	58874.4	26568.57**	1.74
Young men only					
Consumption (in ETB)	Unmatched	71473.7	58880.8	12592.9**	1.82
	ATT	72269.7	50462.75	21,806.93**	1.94
Overall Matched Observation=1,866; young women matched = 982, young men matched = 879. Overall Prob > chi2 = 0.013. *significant at 10% **significant at 5% *** significant at 1%					

Source of basic data: 2018 CBMS Census, selected sites, Ethiopia.

The post-estimation-check (ps test) results shown in Table 27 confirm that, before impact had been determined, observations were balanced based on the predetermined treatment independent variables (matching variables).This was statistically significant at the 1% level of significance for all variables except literacy.

Table 27: PS test of the matching variables after overall matching

Variables	**Treatment**	**Comparison**	**%bias**	**p>|t|**
Age (in years)	19.72	19.60	3.6	0.59
Sex	1.52	1.53	-0.7	0.91
Literacy	1.04	1.02	11.2	0.03
Education level	12.31	12.37	-1.00	0.86

Source of basic data: 2018 CBMS Census, selected sites, Ethiopia.

In their 2017 study, Wang and Shen, using such outcome-independent variables for propensity-score matching as gender, literacy, age, and education level, noted that sex, age, education, and marriage significantly affected personal income.

Table 26 shows that financial inclusion had a maximum impact of 22,921.90 birr on the welfare (consumption) of youth. In other words, a young person who was financially included consumed 22,921.90 birr more than one who was not (statistically significant at 1%). Financial inclusion contributed 26,568.56 birr per annum to consumption by young women, and 21,806.93 birr to consumption by young men (statistically significant at 5% for both men and women).

4.4.6. Factors that determined entrepreneurial engagement

We considered characteristics such as sex, educational status, age, geographical location, per-capita income, household size, current employment status, participation in *idir* (rotating savings and credit groups), loans, receipt of remittances, and access to informal financial services. As in the case of financial inclusion, we used binary logit to determine whether the factors listed above contributed to the involvement of youth in entrepreneurial activities.

Table 28: Logistic Regression Result for Covariates of Entrepreneurial Engagement

Variable (label)	Overall		Young Women		Young Men	
	Entrepreneurial Involvement	Marginal effect	Entrepreneurial Involvement	Marginal effect	Entrepreneurial Involvement	Marginal effect
	Coefficient (Standard error)					
Sex (sex)	-0.02 (0.16)	-0.0003 (0.02)	NA	NA	NA	NA
Educational status (educind)	0.49* (0.27)	0.01* (0.004)	1.04** (0.48)	0.008** (0.004)	0.22 (0.35)	0.01 (0.01)
Age (age)	0.02 (0.02)	0.0003 (0.0003)	0.03 (0.03)	0.000 (0.00)	0.006 (0.03)	0.000 (0.001)
Subcity (subcity)	0.27* (0.13)	0.004** (0.002)	0.30 (0.20)	0.002 (0.002)	0.23 (0.17)	0.01 (0.005)
Per capita income (PCI)	0.000001** (0.000001)	0.000 (0.000)	0.00001 (0.00001)	0.000 (0.00)	0.000 (0.000)	0.000 (0.000)
Family size (phsize)	0.10*** (0.04)	0.002*** (0.001)	0.21*** (0.06)	0.002*** (0.001)	0.01 (0.06)	0.0003 (0.00)
Disability status (pwd_ind)	-0.09 (1.04)	-0.001 (0.02)	Omitted	Omitted	Omitted	Omitted
Entrepreneurial training (training_ind)	0.51* (0.29)	0.01* (0.004)	0.18 (0.42)	0.001 (0.003)	0.78* (0.42)	0.02* (0.01)
Employment status (empind)	-2.70*** (0.27)	-0.04*** (0.004)	-3.02** (0.38)	-0.02*** (0.005)	-2.31*** (0.40)	-0.06*** (0.01)
Social capital (idir_ind)	-0.05 (0.17)	-0.001 (0.002)	0.01 (0.25)	0.00 (0.00)	-0.16 (0.23)	-0.004 (0.01)
Saving status (save)	0.14 (0.18)	0.002 (0.003)	-0.14 (0.28)	-0.001 (0.002)	0.32 (0.24)	0.01 (0.01)
Credit involvement (loan)	1.09 (0.69)	0.03 (0.03)	0.51 (1.16)	0.005 (0.01)	1.63* (0.89)	0.1 (0.1)
Remittances involvement (Remit)	0.87*** (0.18)	0.02*** (0.01)	0.87*** (0.29)	0.01** (0.005)	0.80*** (0.24)	0.03** (0.01)
Informal FSP (informalinst_acc)	-1.57*** (0.47)	-0.02*** (0.008)	-2.53*** (0.60)	-0.02*** (0.01)	-0.01 (1.07)	-0.000 (0.03)
Constant	0.32 (2.54)	NA	1.02 (1.94)	NA	-2.57 (2.65)	NA
Number of observations=4,928 (young women = 2,790; young men = 2,138. *significant at 10% **significant at 5% *** significant at 1%.						
(*) dy/dx is for discrete change of dummy variable from 0 to 1						

Table 28 indicates that the basic factors that contributed negatively to entrepreneurship among young women were educational status, family size, whether they received remittances even though they were employed, and the existence of informal FSP. In the case of entrepreneurship among young men, training, access to loans, and access to remittances contributed highly but being employed affected entrepreneurial intention somewhat negatively.

In general, youth who were educated, lived in rural areas, had high household per-capita income, had large families, received entrepreneurial training, and had access to remittances were highly associated with being an entrepreneur. In contrast, youth who were employed elsewhere and had ready access to remittances were less likely to be entrepreneur.

5 Conclusions and policy implications

5.1 Conclusion

The results and analysis of CBMS data in selected sites in Ethiopia point to the following significant findings on the factors that affect financial inclusion among youth:

- Financial literacy had a positive and significant effect on the degree of use of financial services among financially included youth. The effect varied across the study sites and gender.
- Religion and culture affected participation in financial services.
- The length of the repayment period was important to those who sought financial services from FSP.
- Use of technology by youth (mobile banking and ATMs, e.g.) had an impact on the level of use of financial services.
- Being young men contributed positively to financial inclusion. The proportion of young men who were financially included was 37.70%, but only 32.37% of young women were.
- Youth aged 18 and older were more financially included than those from 15 to 17.
- Distance to FSP had a positive effect on financial inclusion, counter to expectations.
- Income did not have a significant relationship to financial inclusion, contrary to expectations.
- The existence of informal financial sectors had a positive effect on financial inclusion.

In relation to preferences for financial-service providers: (selection)

- Youth who were financially literate preferred banks over microfinance institutions.
- As collateral restraints became tight, youth tended to prefer SACAs over banks. In addition, when the legal and regulatory environment was challenging, youth still preferred SACAs over banks.
- As youth acquired financial information or, similarly, when youth became financially literate, they preferred to receive financial services from banks rather than Local Money Lenders.
- As restraint on collateral request increased, youth moved from banks to Local Money Lenders.
- Those with good financial literacy preferred to receive financial services from banks rather than from informal FSP.
- Strict adherence to religious or cultural values had a positive effect on respondents'' preferences for informal FSP over banks.
- As the challenge of collateral increased, people tended to move toward informal financial institutions such as *equb* rather than to banks for financial services.

The ordered logistic regression enables this study to make the following conclusions:

- Youth who were rigid and dogmatic regarding religious or cultural beliefs were low

users of financial services.

- Strain in the legal and regulatory environment tended to place youth in the category of low use.
- Longer repayment periods tended to make youth high users of financial services (at the 5% level of significance). A short repayment period is, therefore, advisable for FSP.
- The inability to pledge collateral contributed negatively to high use of financial services.
- As technology access increases, youth tended to move into the category of high users of financial services.

Based on the PSM findings, we concluded the following:

- The effect of financial inclusion on welfare is an additional birr 22,921.90 per year.
- Gender-disaggregated regression shows that the effect of financial inclusion on welfare (consumption) is higher and more significant for young women than for young men.

4.5.2. Recommendations

- Need-based financial training should be provided to older youth (25-29).
- Repayment periods should be readjusted in keeping with users' capacities.
- More should be done to address religious beliefs that negatively affect financial inclusion.
- Comprehensive facet e-banking services should be introduced to the financial services market.
- Further research should be conducted to determine why gender impartiality appears in use of financial services.
- More emphasis should be placed on older youth because financial inclusion among youth is low in the older age ranges.
- Because this study found that flourishing informal service providers are good for formal financial inclusion, stakeholders should support or reinforce those service providers.
- Banks are more reliable and secure providers of financial services, and information outlets should deliver up-to-date and relevant financial information in order to encourage youth) to prefer the services of banks.
- Restraints on pledges of collateral should be modified and replaced by other security options.

  The more dogmatic respondents are regarding their religious beliefs, the more they prefer informal financial-service providers. To encounter this effect, FSP should consider providing financial-services tailed to religion (such as those offered by Islamic bank).
- Promotion of entrepreneurship among rural women, improvement of financial literacy in rural areas, and mobile-money-transfer platforms should be adopted as a launch pad to financial inclusion.
- Revisit the assessment criteria of women applications for loans to include "softer" criteria (initiate and issue loans for women owned firms with movable

assets as collateral) in the place of traditional ones.

- Credit offers with lower interest rates should be available to improve the financial inclusion of women.
- Collaboration among informal and formal FSP is the best approach.
- Special loan services that offer credit free of fixed-asset collateral requirements and lower-interest rates should be delivered.
- Cooperation with wereda-level offices (health, education, statistics, e.g.) to implement is necessary to generate the necessary disaggregated data from the CBMS.
- NGOs such as the Consortium of Christian Relief and Development Association (CCRDA) should consider CBMS-generated data for appropriate action, especially with regarding to their initiatives in support of youth and women.

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Annex

The following Tables show standard STATA outputs of logit, probit, and ologit models, respectively (outreg2 results)

STATA output: logit						
VARIABLES	Overall Save	Young Women Save	Young Men Save	Overall Remit	Young Women Remit	Young Men Remit
finlit	0.663***	0.662***	0.658***	0.015	0.111	-0.003
	(0.082)	(0.113)	(0.120)	(0.096)	(0.134)	(0.137)
intdummy	-0.102	-0.080	-0.106	0.519***	0.634***	0.440***
	(0.108)	(0.148)	(0.158)	(0.108)	(0.146)	(0.163)
reldummy	-0.916***	-0.768***	-1.136***	-0.076	-0.205	0.175
	(0.225)	(0.270)	(0.386)	(0.188)	(0.248)	(0.289)
legdummy	0.676***	0.657*	0.689**	0.757***	0.980***	0.705*
	(0.234)	(0.347)	(0.325)	(0.259)	(0.335)	(0.392)
covendummy	-0.021	-0.120	0.144	-0.237	-0.349	0.141
	(0.156)	(0.211)	(0.238)	(0.201)	(0.279)	(0.291)
techudummy	2.488***	2.497***	2.477***	1.245***	1.061***	1.371***
	(0.135)	(0.181)	(0.195)	(0.122)	(0.161)	(0.149)
maledummy	0.080			0.111		
	(0.083)			(0.087)		
Age	0.055***	0.060***	0.052***	0.049***	0.052***	0.035**
	(0.012)	(0.012)	(0.019)	(0.011)	(0.013)	(0.014)
fininst_dist	0.006***	0.007***	0.005***	-0.008	-0.004**	-0.085***
	(0.001)	(0.001)	(0.001)	(0.005)	(0.002)	(0.017)
PCI	0.000	0.000***	0.000	0.000	0.000***	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
inforaccess	0.871**	0.976**	0.671	0.218	0.600	-0.534
	(0.351)	(0.435)	(0.582)	(0.383)	(0.466)	(0.667)
Constant	-2.704***	-2.903***	-2.476***	-2.957***	-3.127***	-2.324***
	(0.224)	(0.261)	(0.336)	(0.236)	(0.300)	(0.309)
Observations	4,928	2,790	2,138	4,928	2,790	2,138

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

STATA outputs: probit												
VARIABLES	(1) Loan	(2) Intdummy	(3) athrho2_1	(4) lnsigma2	(5) Loan	(6) intdummy	(7) athrho2_1	(8) lnsigma2	(9) loan	(10) intdummy	(11) athrho2_1	(12) lnsigma2
intdummy	-3.075***				-3.078***				-3.070***			
	(0.223)				(0.325)				(0.654)			
finlit	-0.015	-0.021*			-0.032	-0.024			0.008	-0.018		
	(0.409)	(0.011)			(0.546)	(0.015)			(1.059)	(0.017)		
techudummy	0.062	0.016			0.109	0.027			0.011	0.004		
	(0.120)	(0.015)			(0.317)	(0.022)			(0.072)	(0.021)		
maledummy	-0.004	-0.001										
	(0.032)	(0.009)										
age	0.014	0.004***			0.006	0.001			0.023	0.007***		
	(0.013)	(0.001)			(0.026)	(0.002)			(0.022)	(0.002)		
fininst_dist	-0.001	0.001***			-0.002	0.001***			-0.001	0.001***		
	(0.035)	(0.000)			(0.076)	(0.000)			(0.070)	(0.000)		
PCI	-0.000	-0.000			-0.000	-0.000			-0.000	-0.000		
	(0.000)	(0.000)			(0.000)	(0.000)			(0.000)	(0.000)		
reldummy		0.086***				0.080***				0.099***		
		(0.023)				(0.029)				(0.036)		
Constant	-0.174	0.028	3.216	-1.129***	0.007	0.085**	3.302	-1.130***	-0.416	-0.039	3.047	-1.130***
	(2.136)	(0.025)	(8.187)	(0.010)	(3.300)	(0.033)	(12.878)	(0.013)	(4.922)	(0.036)	(16.750)	(0.015)

Observations	4,928	4,928	4,928	4,928	2,790	2,790	2,790	2,790	2,138	2,138	2,138	2,138

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

STATA outputs: ologit			
VARIABLES	Overall degruse	Young Women degruse	Young Men degruse
finlit	0.098	0.259	0.111
	(0.113)	(0.158)	(0.167)
intdummy	-0.002	0.121	0.112
	(0.161)	(0.220)	(0.250)
reldummy	-0.639**	-0.451	-0.787
	(0.305)	(0.402)	(0.484)
legdummy	0.709**	1.165***	0.815*
	(0.314)	(0.441)	(0.494)
rpdummy	-0.617***	-0.810**	-0.550*
	(0.222)	(0.325)	(0.319)
colldummy	0.316*	0.254	0.326
	(0.188)	(0.265)	(0.274)
covendummy	0.220	0.404	0.322
	(0.253)	(0.382)	(0.351)
lsdummy	-0.370	-0.496	-0.565
	(0.557)	(0.767)	(0.862)
techudummy	0.322***	0.144	0.527***
	(0.117)	(0.168)	(0.167)
maledummy	0.067		
	(0.103)		
Age	-0.016	-0.003	-0.037*
	(0.013)	(0.018)	(0.019)
fininst_dist	-0.005***	-0.004**	-0.079***
	(0.002)	(0.002)	(0.019)
PCI	0.000**	0.000*	0.000
	(0.000)	(0.000)	(0.000)
inforaccess	0.318	0.659	-0.219
	(0.431)	(0.536)	(0.752)
/cut1	0.295	0.666	-0.392
	(0.297)	(0.417)	(0.428)
/cut2	5.213***	5.362***	4.880***
	(0.459)	(0.609)	(0.713)
Observations	1,709	903	806

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