FINANCIAL INCLUSION IN TURKEY: EVIDENCE FROM INDIVIDUAL LEVEL DATA *

Dr. Öğr. Üyesi Ekin Ayşe Özşuca
Çankaya Üniversitesi
İktisadi ve İdari Bilimler Fakültesi
ORCID: 0000-0002-5615-3028

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Abstract

Using individual level data from the World Bank Global Findex for 2017, this study analyzes the level of financial inclusion and explores its main determinants in Turkey. In particular, it explores how individual characteristics (i.e. gender, age, income, education) are associated with the usage of formal financial services and impinge on the perceived barriers to account ownership among financially excluded individuals in Turkey. The results of the study indicate that being man, older, richer and more educated increases the likelihood of having a formal account and formal saving. Moreover, mobile banking is found to be driven by identical individual characteristics with that of other traditional formal financial services usage. As regards with the main obstacles for not having a formal account, each one of the individual attributes seems to be significant in explaining different voluntary and involuntary self-reported barriers behind financial exclusion. The findings are of remarkable importance for designing policies to promote financial inclusion in Turkey.

Keywords: Financial inclusion, Financial institutions, Financial services, Household finance, Turkey

Türkiye'de Finansal Tabana Yayılma: Mikro Veriye Dayalı Bir Araştırma

Öz

Bu çalışmada, Türkiye'de finansal tabana yayılma düzeyi ve temel belirleyicileri Dünya Bankası'nın 2017 Küresel Finansal Tabana Yayılma mikro veri seti kullanılarak incelenmektedir. Bu doğrultuda, bireysel özelliklerin (cinsiyet, yaş, gelir, eğitim) yasal finansal hizmetlere erişim ile ilişkisi ve bu özelliklerin finansal hizmetlere erişimi olmayan bireylerin hesap sahibi olması önündeki engelleri nasıl etkilediği incelenmektedir. Çalışmanın sonuçları erkek, daha yaşlı, daha yüksek eğitim ve gelir seviyesine sahip olan bireylerin, yasal bir finansal kuruluşta hesap sahibi olma ve tasarruf etme olasılığının daha yüksek olduğunu göstermektedir. Buna ek olarak, mobil bankacılık üzerinde diğer geleneksel yasal finansal hizmetler kullanımı ile benzer bireysel özelliklerin etkili olduğu sonucuna ulaşılmıştır. Hesap sahibi olma konusundaki engellere yönelik sonuçlar, her bir bireysel özelliğin yasal bir kuruluşta hesap sahibi olmayan bireyler tarafından beyan edilmiş farklı iradi ve gayri iradi engelleri açıklamada anlamlı olduğunu göstermektedir. Çalışmanın bulguları Türkiye'de finansal tabana yayılmayı arttıracak politikaların oluşturulması açısından büyük önem taşımaktadır.

Anahtar Sözcükler: Finansal tabana yayılma, Finansal kurumlar, Finansal hizmetler, Hanehalkı finansmanı, Türkiye

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Financial Inclusion in Turkey: Evidence from Individual Level Data

Introduction

Financial inclusion- access to and use of formal financial services- has become a subject of growing interest in the development and policy agendas worldwide especially in the aftermath of the global financial crisis, while there has been mounting evidence documenting its potential benefits for the individuals and society as a whole. Enhancing financial inclusion is likely to reduce poverty and alleviate inequality by drawing the unbanked adults into the formal financial system, which enable them to accumulate their savings, invest in assets that could generate income in the future and protect against financial risks. Accordingly, inclusive financial systems can contribute positively to productivity, economic growth and development along with financial stability.

Consequently, over the past decades, policy makers underscore financial inclusion as a key public priority in pursuing sustainable development goals and accordingly, numerous efforts have been made to foster financial inclusion both at the national and global level. In particular, international organizations such as World Bank and G20, have endorsed upon the pursuit of inclusive banking agenda as an important policy objective of their development strategies, while several policies have been adopted and many targets were set to enhance the inclusive financial sector by national governments in conjunction with those multilateral initiatives.

In the light of these developments, an improved understanding of the financial inclusion is crucial for addressing its growth, development and poverty consequences. A comprehensive diagnosis of financial inclusion as well as the main barriers and underlying factors associated with those who are excluded in the formal financial system along individual characteristics allows a multidimensional array of policy implications. In this fashion, policy makers can assess the varying effects of their policies across individual characteristics and accordingly, design effective government policies in enhancing financial inclusion by attracting hitherto excluded population.

According to the World Bank Global Findex data, the proportion of Turkish adult population who had an account at the formal financial institution

stands at 68 percent in 2017, while this figure was realized at 58 and 57 percent in 2011 and 2014, respectively. Turkey's figure stands close to the world average of 67 percent and slightly surpasses the developing countries average of 61 percent by 2017. Despite the 10 percentage point improvement in the share of account ownership between 2011 and 2017, Turkey's figure is remarkably low relative to most of the OECD member countries; yet it is still 5 percentage points below to that of the average of upper middle income countries. Furthermore, Turkish government has launched its national financial inclusion strategy in 2014 to address financial inclusion gaps and enhance the usage of formal finance. Against this backdrop, a better understanding of the level and determinants of financial inclusion in Turkey is at utmost importance to expand financial services to all and facilitate further development goals.

Despite the ample evidence on the positive potential benefits of financial inclusion, there have been just a couple of papers that focus on financial inclusion in the context of Turkey. Along these lines, this study aims to extend and contribute to this scant empirical literature about financial inclusion in Turkey by employing a rich individual level data set to provide a comprehensive and detailed diagnosis of financial inclusion patterns in Turkey. In doing so, it examines the level of financial inclusion and elucidates its main determinants in Turkey. More specifically, it explores the individual characteristics associated with the usage of formal financial services together with the perceived barriers to account ownership among financially excluded individuals. To the best of our knowledge, this paper offers first such an exclusive analysis for understanding main challenges in account ownership in Turkey.

The empirical analysis is based on micro level data from the 2017 World Bank Global Findex of Demirgüç-Kunt et al. (2018)[1]. This study will be first to use this recent detailed data set for examining financial inclusion in Turkey. Embodying a rich set of information on the usage of formal and informal financial products as well as barriers to access to these instruments, this database is invaluable for implementing such a comprehensive financial inclusion analysis for Turkey. Of particular interest for this study are financial inclusion variables, namely account ownership in a financial institution, mobile money account ownership, formal saving and formal borrowing. Besides, self-documented

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1 Numerous studies have been used earlier versions of 2011 and 2104 Global Findex database to investigate financial inclusion either on cross-country basis or individual-country basis. For cross-country studies, see Demirgüç-Kunt et al. (2013), Demirgüç-Kunt and Klapper (2013), Gutierrez and Singh (2013), Klapper and Singer (2015), Allen et al. (2016), Demirgüç-Kunt et al. (2016), Zins and Weill (2016), Soumare et al. (2016), Botric and Broz (2017), among others. As regards with single country cases, see Efobi et al. (2014) for Nigeria, Fungacova and Weill (2015) for China, among others.

reasons for not having an account at a formal financial institution are used for exploring motives for financial exclusion. The data set also includes various other variables of individual characteristics such as education, income, age, gender, education, which allows to identify not only underlying characteristics associated with particular types of financial behaviors, but also population segments that are most likely to be financially excluded. Accordingly, a multivariate probit analysis is performed to examine how individual attributes are associated with financial inclusion in Turkey. Therefore, this paper provides recent evidence on financial inclusion in Turkey using novel individual-level data.

A thorough analysis of financial inclusion provides insights on households finance, the way that individuals manage their borrowing and saving decisions besides their future plans of finance. Moreover, a profound understanding of access to and use of financial services at individual level enables to identify main individual characteristics, such as income, gender, education and age, associated with use of formal finance and main obstacles to financial inclusion as well. Hence, the findings of the study are of great importance for such an emerging country context in promoting financial inclusion.

The remainder of the paper is organized as follows: section 1 reviews the existing literature on financial inclusion in Turkey. Based on individual level data, Section 2 provides a comprehensive descriptive analysis of financial inclusion patterns in Turkey with a specific focus on main barriers for financial exclusion and alternative sources of saving and borrowing. Section 3 presents the econometric model and methodology that have been adopted to examine the financial inclusion patterns using individual characteristics, while results of the multivariate analysis are discussed in Section 4. Final section concludes.

1. Financial Inclusion in Turkey: Review of Empirical Evidence

To date, the literature on financial inclusion in Turkey has been rather scant and only a few papers provide empirical evidence on that issue[2]. Among these studies, Yorulmaz (2013) develops a multidimensional financial inclusion index covering the period between 2004 and 2010 to elucidate the extent of financial system across Turkey and make comparisons among different regions and provinces. The empirical results of the study reveal a positive relationship between financial inclusion and income levels of the regions and provinces.

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2   Apart from that empirical literature, see Aysan et al. (2013) for an evaluation of the performance of participation banks and their role on financial inclusion in Turkey; see Güngen (2018) for an analysis of financial inclusion and policy making agenda in the Turkish context.

Using a representative survey of the Turkish household sector, Davutyan and Öztürkkal (2016) explores the determinants of saving/borrowing behavior in Turkey. The models comprising the saving decision, form of saving, bank loan decision and formal/informal borrowing as dependent variables display that region, marital status, income and education level are significantly correlated with the saving/borrowing behavior. Gender and urbanization are also found to be associated with saving and borrowing decisions.

Looking through the previous literature regarding financial inclusion in Turkey, the paper by Azevedo et al. (2016) is the only one that utilizes the earlier editions of Global Findex data set. The authors examine the link between financial inclusion and poverty reduction in Turkey. Using 2011 and 2014 Global Findex and the Survey on Income and Living Conditions databases, they calculate the equity adjusted coverage ratio both at the individual and household level to analyze the distribution of financial coverage across sub-populations. Their study also compares Turkey's index and its components with that of nearest neighbor countries as well. The findings indicate that account usage is lowest among females, youngest, poorest and less educated population, while the most important source of disparity appears to be gender.

As the above review suggests, there exists only a limited number of studies on financial inclusion in Turkey, which in general focus on different aspects. This study brings novelty on the previous empirical literature by employing the latest Global Findex data to provide a comprehensive diagnosis of financial inclusion patterns in Turkey, its main determinants as regards with individual attributes and present recent evidence. Moreover, to the best of our knowledge, there is no study in the previous literature that examines the main determinants of barriers to financial inclusion in an econometric framework for Turkey. Besides, appealing to different dimensions of financial inclusion, this study is the first to provide evidence on the underpinnings of mobile money account usage in the Turkish context as well.

2. Data and Descriptive Analysis of Financial Inclusion Patterns in Turkey

In this section, main patterns of financial inclusion in Turkey are reviewed by employing the 2017 World Bank Global Findex dataset of Demirgüç-Kunt et al. (2018). This dataset covers financial inclusion information for more than 150 countries across the globe, which makes up approximately 97 percent of world's population, for the year 2017. It is built by compiling randomly selected, nationally representative surveys of more than 150,000 adults and provides detailed information on how individuals access accounts, make and receive payments, use financial technology, save and borrow. In particular, survey results

provide micro data for financial behavior of adults by several personal and household attributes. As regards with Turkey, the dataset includes 1000 individuals; while the target population is entire civilian, noninstitutionalized Turkish resident population aged at least 15.[3]

Based on this individual-level data, this section provides a detailed descriptive analysis of financial inclusion patters in Turkey. First the extent of financial inclusion is assessed based on alternative financial indicators. Next, main purposes and alternative sources of saving and borrowing patterns are presented. Finally, the reasons for not having an account among unbanked are examined using related survey responses. Specifically, information about the survey questions with their codes, utilized in the analysis is provided in the Appendix.

2.1. Main Financial Inclusion Indicators

Table 1 depicts the main financial inclusion indicators for years 2014 and 2017 regarding Turkey. Financial inclusion is measured by alternative indicators capturing different aspects of usage of financial services. Specifically, these indicators are account ownership at a financial institution, mobile money account ownership, saving in the last 12 months and borrowing in the last 12 months. As regards with saving and borrowing behavior, the questionnaire explicitly asks whether individuals did through formal or informal means. Accordingly, usage of these saving and credit products are defined as formal if the individual saved at or borrowed from a formal financial institution, and informal if the individual used alternative forms of saving/borrowing. For informal credit, it is distinguished between cases when individuals borrow from an informal savings club or from family/friends, while informal saving includes the usage of community savings club. However, in Table 1, figures related with saving and borrowing are presented without a formal/informal breakdown.

As illustrated in Table 1, the share of individuals having an account at a formal financial institution increased considerably from 63 percent in 2014 to 76 percent in 2017. Taking account the world average, Turkey seems to exhibit a similar level of financial inclusion in terms of account ownership, while its share is slightly lower, nearly 5 percentage points, than that of average of upper middle income countries. According to the World Development indicators for 2017, Turkey has per capita GDP of $10,546, which is relatively higher than that of the corresponding average of the upper middle income countries, $8,610. As GDP

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3   For further details about survey methodology, see Demirgüç-Kunt et al. (2018). Additional information can also be found at https://www.gallup.com/178667/gallup-world-poll-work.aspx

per capita is argued to be an important factor in explaining cross-country discrepancies in the formal account usage by Demirgüç-Kunt and Klapper (2013), the related figures imply that formal account ownership in Turkey is quite low given its level of economic development. A particularly notable financial inclusion pattern over these years has been the increase in the share of individuals having a mobile money account. Specifically, the share of respondents who declared owning mobile money account has risen from 1 percent in 2014 to 19 percent in 2017, which is not surprising given the ever-mounting innovations in financial technology leading to a more common usage of mobile banking. The figures of Turkey concerning mobile money accounts are strikingly higher than global trend, which highlights the potential of mobile banking for promoting an even greater level of financial inclusion in Turkey. In terms of saving, 42 percent of individuals have reported to save in the past one year, while, in 2014, 45 percent did so. In that case, Turkey scores lower than world and upper middle income economies averages, which were realized as 48 and 46 percents, respectively. This is in line with the Turkey's lower savings rate as a share of its income compared with its emerging country counterparts. Turning to credit figures, share of individuals that have borrowed money in the last 12 months climbed from 51 percent up to 67 percent between 2014 and 2017. Rates of borrowing in Turkey are significantly higher from those observed in the world and upper middle income economies, as the share who reported borrowing in the last years averaged 47 percent in the globe and 44 percent in the upper middle income country group. Demirgüc-Kunt and Klapper (2013) report a positive link between the formal credit usage and the ratio of GDP to domestic credit to private sector as an indicator of financial development level of an economy. The World Bank (2017) indicates that the domestic credit to the private sector by banks as a share of GDP is 67 percent in Turkey, which is significantly lower than that of upper middle income countries average, 113 percent. Therefore, it could be inferred that formal credit usage by individuals is considerably high given Turkey's relatively lower financial development level compared with the group of upper middle income countries. All in all, summary statistics regarding saving/borrowing behavior reflect the observed decline in household savings rates and general tendency of an increase in household indebtedness at the macro level in Turkey.

Table 1. Main financial inclusion indicators

	2014			2017		
	obs.	mean	std dev.	obs.	mean	std dev.
Account ownership	1002	0.6277	0.4836	1000	0.7600	0.4229
Mobile money account ownership	1002	0.0109	0.1042	1000	0.1890	0.3917
Saving	1002	0.4501	0.4978	1000	0.4180	0.4934
Borrowing	1002	0.5059	0.5002	1000	0.6680	0.4711

It is important to note that saving and borrowing through formal means to be affected by different factors and thereby, exhibit different patterns with those of general saving and credit. Therefore, a further breakdown of the formal/informal saving and borrowing behavior deserves interest as it can provide some additional insights on financial inclusion patterns. In this regard, following part includes figures concerning this distinction.

2.2. Main Purposes and Alternative Methods of Saving/ Borrowing

Table 2 and 3 present the summary statistics for alternative forms of saving and borrowing, respectively. Additional information on the main purposes for usage of saving and credit products is provided as well.

Regarding the main reasons for saving, the survey specifies two reasons as; for old age and for business. As illustrated in Table 2, 12 percent of adults identified to start, operate and expand business as a reason of having saved in the last one year and 22 percent reported having saved for old ages. Turkish saving habits seem to be similar to that of the world average, since, globally saving for old age is the main motivation for the 21 percent of adults, while 14 percent cited to have saved for business purposes. Among alternative saving means, the share of adults who reported to have saved formally is 27 percent and higher than the 11 percent who said they have saved semiformally such as using informal saving club or from a person outside the family. Extending the analysis further among the individuals who have saved by a formal/ informal breakdown reveals an even more remarkable pattern. Of adults who saved in the last one year, 65 percent report that they had saved at a formal financial institution, while saving through an informal saving club or a person outside the family is reported by about 25 percent. Evidently, this finding indicates that formal ways is the common mode of saving among savers in Turkey. Particularly notable fact is that higher shares of having an account at a financial institution do not yield higher formal saving

in Turkey, as a detailed decomposition of individual level data depicts that only 34 percent individuals with accounts saved at a formal financial institution in the last 12 months, whereas 66 percent have not.

Table 2. Main purpose and alternative sources of saving

purpose	obs.	mean	st. dev.	alternative ways	obs.	mean	st. dev.
arm/business	1000	0.1240	0.3297	*Financial institution*	1000	0.2660	0.4420
Old age	1000	0.2160	0.4117	*Informal savings club*	1000	0.1060	0.3079

Figures related with main reasons and alternative sources of borrowing are presented in Table 3. The survey asked whether individuals have credit from a formal financial institution for home, apartment, or land purposes, while 12 percent reported to do so. Furthermore, having borrowed, not necessarily through formal means, for health purposes or farm/business purposes are also surveyed. In that case, the share of individuals who reported to have borrowed in the last one year for medical purpose and for starting, operating, growing farm/ business are 11 and 9 percent, respectively. Among alternative sources of borrowing, borrowing formally-from a financial institution- was reported by 17 percent of adults as illustrated in Table 3. Borrowing from family/friends has a higher share, as reported by the 30 percent of the individuals, while informal savings club seems to be seldom used source of borrowing, with only 5 percent of individuals having borrowed semiformally. However, the picture clearly changes when figures about borrowing through the use of credit cards are included. In particular, 51 percent of individuals reported to have a credit card and among those, 90 percent have used their card in the last one year. Overall, formal borrowing stands out as the most common mode of credit in Turkey. Moreover, if one traces the detailed figures concerning the role of credit cards in formal borrowing, Turkey emerges as a country with a strikingly high credit card usage. Indeed, nearly 75 of individuals have reported to borrow merely through using a credit card, but not a loan from financial institution in the last 12 months.

Table 3. Main purpose and alternative sources of borrowing

purpose	obs.	mean	st. dev.	alternative ways	obs.	mean	st. dev.
ome/apartment/land	1000	0.1240	0.3297	*Financial institution*	1000	0.1700	0.3758
Medical	1000	0.1140	0.3179	*Family /friends*	1000	0.3050	0.4606
Farm/business	1000	0.0930	0.3001	*Informal savings club*	106	0.0500	0.4811

2.3. Challenges for Account Ownership

In the survey, the unbanked respondents are asked to cite reasons for not having an account at a formal financial institution, while they are allowed to give multiple answers. These factors can be stated as: too far away, too expensive, lack of documentation, lack of trust, lack of money, religious reasons, family member has one, no need for financial services. As put forward by Allen et al. (2012:11-12), some of the reasons that dissuade individuals from having an account can be seen as voluntary like family member has one, no need for financial services, lack of money, religious reasons, while some of them result from market failures and are considered to be involuntary exclusion such as too far away, too expensive, lack of documentation, lack of trust. Understanding those factors that impede financial service usage either voluntarily and involuntarily, is at utmost importance for designing policies to overcome financial exclusion and expand account use.

Table 4. Reasons for not having a formal account

Variable	Observations	Mean	Standard deviation
Too far away	279	0.1219	0.3277
Too expensive	279	0.2043	0.4039
Lack of documentation	279	0.1326	0.3397
Lack of trust	279	0.2222	0.4164
Lack of money	279	0.3727	0.4844
Religious reasons	279	0.1756	0.3811
Family member has account	279	0.6344	0.4824
No need for financial services	279	0.4337	0.4964

Along these lines, Table 4 presents these reasons for not having an account, which shed some interesting light on barriers that need to be addressed to facilitate higher levels of financial inclusion in Turkey. The most common reason for not having an account in Turkey is that another family member already has an account. In particular, 63 percent of unbanked adults identified this as a reason. Notably, Turkey's figure is remarkably higher when compared with the world average, which was 26 percent. In that case, a more detailed look at the descriptive statistics indicates a noticeable pattern. Across female/male divide, 70 percent of women reported not having an account because another family member has, while 46 percent of men cited this as a reason among unbanked adults. Considerably higher shares cited by women may be the result of some cultural and economic factors such as social pressures on being a housewife,

traditional gender division of labor, women's limited participation to economic life, low female labor force participation in Turkey.

The next most common barrier is lack of need for financial services, which was reported by 43 percent of adults without an account for not having one. This suggests a high degree of financial illiteracy and/or low level of financial awareness prevailing among unbanked adults.

Among other reasons, about 37 percent of unbanked individuals reported not having an account because they do not have enough money. This is because the benefit of having an account is lower than and cannot compensate for the cost of getting an account for those adults with insufficient cash earnings. Also noteworthy is the fact that this was the most frequently cited reason for not having an account around the globe with a share of 60 percent, whereas it seems to be less important, though still with a high share, for financial exclusion in Turkey.

Around one fifth of adults without an account also cited lack of trust in financial institutions and high cost of opening an account as the reason for not having an account. Price of having an account could hamper account ownership since excessive bank charges may cause individuals to be not able to maintain and use a bank account. On the other hand, the lack of trust is about individual's perception of financial institutions' safety and is closely related with the past history of policy failures, financial and political stability, and prevailing uncertainty in the country. It could be stated that Turkey's figures exhibit a more or less similar to that of world averages as regards with these self-reported barriers.

Religious reasons are another important barrier to account ownership, cited by around 18 percent of unbanked. In particular, only 6 percent individuals without account identified religious regions as a reason across the world, but this figure is noticeably greater for countries with a predominantly Muslim population. As interest is prohibited by Islam, Muslims may be unwilling to have accounts at formal financial institutions, but they rather prefer to use Sharia-compliant banking services. Yet, Turkey's share of religious self-exclusion is even higher when compared with that of some other Muslim countries such as Kuwait, Indonesia, Malaysia and Bangladesh, which could be attributed to the greater extent of presence and activity of Islamic finance industry in those countries.

Among the involuntary exclusion obstacles, lack of documentation and proximity to a bank are relatively less important in explaining financial exclusion in Turkey, which was cited by 13 and 12 percent of unbanked individuals respectively. Lack of documentation do not feature as a great barrier for not having an account, which may stem from the fact that opening an account is rather a simple process with limited documentation requirements in Turkey. Also

it is not surprising that the lack of physical accessibility has a weak effect of financial exclusion in Turkey given the relatively high level of banking sector outreach with high numbers of bank branches and automated teller machines when compared to that of OECD and high middle income country averages. Globally higher shares are reported as regards with these barriers relative to Turkey as well.

Overall, figures regarding perceived barriers to account ownership reveal an evident fact that voluntary reasons seem to be the fundamental driving force behind the motives for financial exclusion in Turkey. Indeed, a larger proportion of unbanked Turkish adults are more likely to be voluntarily self-excluded as account ownership by another family member, insufficient cash earnings, are the most commonly cited reasons for not having an account. On the other hand, involuntary factors seem to play a fairly limited role in explaining financial exclusion since reasons associated with the absence of trust in financial institutions, high costs of opening an account, long distances to banks and documentation requirements are reported by a considerably lower proportion of the respondents.

3. Econometric Model and Methodology

In order to investigate financial inclusion patterns in more detail and further delve into how individual characteristics impinge on these patterns, probit model is estimated for various measures of financial inclusion adopting several individual attributes as explanatory variables. Accordingly, following specification is utilized in the empirical analysis:

$$FI_i = \beta_1 + \beta_2\ GENDER_i + \beta_3\ AGE_i + \beta_4\ INC_i + \beta_5\ EDUC_i \qquad (1)$$

where *FI* stands for one of the four measures of financial inclusion, namely (I) account ownership *(ACCOUNT)*, (II) mobile money account, (III) formal savings *(SAVING)* and, (IV) formal borrowing *(CREDIT)*, for individual *i*. The dependent variable in the probit equation is a dummy variable which takes the value one if the individual (I) had an account in a formal financial institution, (II) had a mobile money account (III) saved at a formal financial institution in the past 12 months, (IV) borrowed from a formal financial institution in the past 12 months, and zero otherwise.

In equation (1), financial inclusion is modeled as a function of a set of individual characteristics that are well established in the literature as potential determinants of financial inclusion. These variables are mainly: gender *(GENDER)*, age *(AGE)*, income *(INC)*, and education *(EDUC)*. In the model, the gender variable consists of a dummy variable *FEMALE* proxing whether the individual is a female. Age of the person, *AGE*, is further included as explanatory

variable since it is postulated to have a likely impact on access to financial inclusion. Moreover, squared age, *AGESQ,* is also incorporated into the empirical specification in order to control for the possible quadratic relationship between age and participation to the formal financial system. Four dummy variables are included for income quintiles, which take the value one if the individual's income is in a given quintile, zero otherwise. More specifically, *INC1, INC2, INC3* and *INC4* stand for the lowest income quintile (poorest 20 percent), second lowest income quintile (second 20 percent), middle income quintile (third 20 percent) and second highest income quintile (fourth 20 percent), respectively. Here, the dummy variable for the highest income quintile is omitted. As regards with the education variables, two dummy variables are incorporated into the specification. First one is *SECED,* which is equal to one if the individual is a secondary school graduate, whereas the second one is *TERED,* that takes the value one is if the respondent holds a tertiary degree.

The analysis is further extended to elucidate the obstacles in having an account and explore the likely impacts of individual attributes on those barriers. In this regard, the dependent variable in equation (1) is replaced by self-reported reasons of financial exclusion, which takes the value 1 if the individual cited the factor as reason of not having an account in the survey, zero otherwise.

A detailed description of the variables is presented in Table 5 and summary statistics are provided in Table 6.

Table 5. Description of Variables in the Empirical Analysis

Variable	Notation	Description
Account ownership	*ACCOUNT*	1 if the person has an account in a financial institution, 0 otherwise
Mobile money acc.	*MOBILE*	1 if the person has an mobile money account, 0 otherwise
Formal savings	*SAVING*	1 if the person saved using an account at a financial institution, 0 otherwise
Formal borrowing	*CREDIT*	1 if the person borrowed from a financial institution, 0 otherwise
Female	*FEMALE*	1 if the person is female, 0 otherwise
Age	*AGE*	Age of the person
Age squared	*AGESQ*	Square of the age of the person
Income quintile 1	*INC1*	1 if income is in the first quintile (poorest 20%),0 otherwise
Income quintile 2	*INC2*	1 if income is in the second quintile (second 20%),0 otherwise
Income quintile 3	*INC3*	1 if income is in the third quintile (third 20%),0 otherwise
Income quintile 4	*INC4*	1 if income is in the fourth quintile (fourth 20%),0 otherwise
Secondary education	*SECED*	1 if person completed secondary education, 0 otherwise
Tertiary education	*TERED*	1 if person completed tertiary education , 0 otherwise

Table 6. Descriptive Statistics of Variables in the Empirical Analysis

Variable	Observations	Mean	Standard deviation
ACCOUNT	1000	0.7600	0.4229
MOBILE	1000	0.1890	0.3917
SAVING	989	0.2689	0.4436
CREDIT	992	0.1714	0.3770
FEMALE	1000	0.4900	0.5001
AGE	1000	37.0550	13.6609
AGESQ	1000	1559.5070	1154.122
INC1	1000	0.1460	0.3118
INC2	1000	0.1490	0.3562
INC3	1000	0.1850	0.3884
INC4	1000	0.2120	0.4089
SECED	1000	0.6580	0.4746
TERED	1000	0.1300	0.3364

4. Estimation Results

4.1. Determinants of Financial Inclusion

The marginal effects of the probit estimation results[4] for the financial inclusion variables are reported in Table 7, while columns I, II, III and IV show the findings of the models employing account ownership, mobile money account ownership, formal saving and formal credit as the dependent variable, respectively. Overall, the results demonstrate the impact of several individual characteristics on the probability of being financially included.

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4   In order to address the heteroscedasticity issue, heteroscedastic probit models are estimated and the related LR statistics do not reject a model without heteroscedasticity, suggesting that heteroscedasticity is not a problem for the models (I) through (IV) in Table 7 and specifications (I) through (VIII) in Table 8.

Table 7. Estimation results for determinants of financial inclusion

	Model I *(ACCOUNT)*	Model II (MOBILE)	Model III *(SAVING)*	Model IV *(CREDIT)*
FEMALE	-0.1913*** (0.0266)	-0.0347 (0.0229)	-0.0604** (0.0280)	-0.0678*** (0.0233)
AGE	0.0275*** (0.0049)	0.0194*** (0.0062)	0.0219*** (0.0066)	0.01495*** (0.0295)
AGESQ	-0.0002*** (0.0001)	-0.0003*** (0.0001)	-0.0003*** (0.0001)	-0.0002*** (0.0001)
INC1	-0.1728*** (0.0463)	-0.0554 (0.0341)	-0.1766*** (0.0398)	-0.0333 (0.0343)
INC2	-0.1686*** (0.0452)	-0.0295 (0.0362)	-0.1195*** (0.0431)	0.0485 (0.0399)
INC3	-0.0745* (0.0383)	-0.0391 (0.0332)	-0.1019** (0.0411)	0.0177 (0.0350)
INC4	0.0035 (0.0331)	0.0295 (0.0358)	0.0518 (0.0440)	0.0240 (0.0334)
SECED	0.2198*** (0.0473)	0.0438 (0.0062)	0.1132*** (0.0365)	0.0908*** (0.0295)
TERED	0.3166*** (0.0266)	0.1535*** (0.0493)	0.1465*** (0.0538)	0.0474 (0.0406)
Observations	1000	1000	989	983
Pseudo R2	0.1677	0.0828	0.0803	0.0461
Log likelihood	-458.6588	-444.6518	-529.5989	-427.3280

Notes: standard errors are presented in parentheses.
***,**,* denote statistical significance at 1%, 5% and 10% levels, respectively.

As the first explanatory variable, being female is found to be negatively significant for three of the financial inclusion indicators, except the money account ownership, implying the existence of a gender gap in usage of financial services in Turkey. Therefore, women are less likely to have an account in a financial institution and exhibit lower rates of formal saving and formal borrowing. In particular, women are 19 percentage points less likely than men to have an account at a financial institution, whereas they are approximately 6 percent less likely to have a formal saving and formal borrowing relative to men in Turkey. Women's lower demand for financial services relative to men might be due to several factors such as their limited social mobility outside the home, low participation in economic life and restricted control on managing the income stream of the household given the traditional role of women in the Turkish family

structure. Therefore, this finding highlights that gender exerts a significant impact on financial inclusion, confirming the well-known stylized fact that women tend to be more financially excluded as they often suffer from barriers of entry into formal financial system.

As displayed in the results obtained from Model I through IV, coefficient estimates for AGE and AGESQ are significant for all financial inclusion variables, with positive and negative signs respectively. That is to say, age and the probability of being financially included display a nonlinear relationship. This means that individuals at older ages typically use more formal financial services compared with young individuals. However, after a certain age individuals' participation into formal financial system tend to fall, thereby resulting in lower probabilities of financial inclusion. This result might be attributable the demand-side or supply-side driven generational effect, as put forward by Fungacova and Weill (2015: 202), which posits that individuals' willingness to use financial services might fall as they get older and/or financial institutions may also be more reluctant to attract those older customers as well. This inverse U-shaped quadratic relationship between age and financial inclusion in Turkey conforms well to the previous findings of Fungacova and Weill (2015) for China and Zins and Weill (2016) for Africa and Allen et al. (2016) for the world.

Regarding income level, the coefficient estimates for the three lowest income quintiles are found to be negative and statistically significant, whereas the fourth income quintile dummy becomes statistically insignificant for the specifications employing account ownership (Model I) and formal savings (Model III) as dependent variable. With larger negative coefficients for lower income quintiles, individuals in the poorest 20 percent, second 20 percent and middle 20 percent are found to display a significantly lower probability of being financially included in terms of account ownership and formal saving when compared to the base category of richest 20 percent. In particular, adults in the poorest 20 percent are 17 percent less likely to have an account and save in a financial institution than the richest 20 percent. This finding is in accordance with a priori expectations and supports the previous empirical evidence- such as Demirgüç and Klapper (2013) and Fungacova and Weill (2015)- which associates financial inclusion with higher income levels. On the other side, income level seems to play no role in explaining mobile money account ownership and formal borrowing, as dummy variables for all four income quintiles ceases to be statistically significant.

Turning to education, the results reveal a significantly positive relationship with account ownership at a financial institution and formal savings, which are in line with the well-established association between schooling and financial inclusion. In particular, the higher the level of education of an individual, the

greater is his/her likelihood of having an account or saved at a formal financial institution. Put differently, adults with any higher level of educational attainment have significantly lower probability of being financially excluded in terms of account ownership and formal saving, compared to the reference category of individuals completed primary education or less. On the other hand, the figures regarding money account ownership and formal credit are slightly different. As regards with the formal borrowing, the coefficient attached to secondary education is found to be positively significant, whereas coefficient estimate of tertiary education turns out as statistically insignificant. Conversely, as displayed in the findings of model (II), only the dummy variable for tertiary education is significant and positive for money account ownership. This result is not surprising as mobile financial services are more likely to be used by individuals with a higher education attainment.

The results, overall, reveal that gender, age, education and income level are significantly related with financial inclusion, yet there exists some discrepancies regarding alternative financial inclusion indicators. Females are significantly more financially excluded than males as regards with all aspects of financial inclusion, except mobile money account usage. Moreover, a U-shaped quadratic relationship is observed between age and financial inclusion, which is consistent with the previous findings in the empirical literature. Further, financial inclusion, as measured by account ownership and formal saving, declines as income level and educational attainment increases. All in all, individual attributes seem to have greater impact on bank account ownership and formal saving. Therefore, age and gender appear to be significant in explaining further dimensions of financial inclusion among these individual characteristics, nonetheless education emerges as the most powerful predictor when the marginal effects are considered. In particular, those with tertiary degree or more are approximately 32 percent more likely to have formal account and 15 percent more likely to have saved by formal means. Whereas, being female reduces the likelihood of having a bank account and formal saving by 19 and 6 percent, respectively. A strong influence of income is observed for formal savings as well.

When findings of this study are compared with the previous empirical evidence on the impact of individual attributes on formal account ownership and formal savings, results concerning age, education and age conforms to that of Fungacova and Weill (2015) for China, Zins and Weill (2015) for Africa and Allen et al. (2016) for the world. That is, more educated, richer and older to certain extent individuals have higher likelihood to have bank account and formal saving. Notably, a negative association is observed between being a female and financial inclusion as for the Turkish economy. While this finding is in line with the Chinese and African sample, it stands in contrast with that of the world

sample, as no significant relationship is documented between gender and usage of financial services by Allen et al. (2016).

Lastly, the results regarding mobile money account ownership indicator deserve particular attention as this is the first study to provide empirical evidence on the individual attributes using those services. Evidently, findings all together point out that mobile banking are driven by identical individual characteristics with that of other traditional formal financial services usage, while, in particular, similar findings and interpretations apply for results as regards with the formal borrowing.

4.2. Barriers of Financial Inclusion

Table 8 displays the marginal effects of probit estimations results for self-reported reasons of not having an account. In regression specifications I through VIII, the dependent variable is one of the eight barriers that have been cited by respondents in the survey.

Table 8. Estimation Results for Barriers of Financial Inclusion

	I. *Too far*	II. *Too expensive*	III. *Lack of documentation*	IV. *Lack of trust*	V. *Lack of money*	VI.*Religious reasons*	VII. *Family member*	VIII. *No need*
FEMALE	-0.0442 (0.0498)	-0.1919*** (0.0642)	-0.1134** (0.0547)	0.0829 (0.0608)	-0.1484** (0.0688)	-0.0655 (0.0592)	0.2804*** (0.0701)	-0.0502 (0.0713)
AGE	0.0046 (0.0074)	0.0090 (0.0093)	0.0031 (0.0070)	-0.0050 (0.0088)	-0.0040 (0.0105)	-0.0154* (0.0085)	-0.0022 (0.0111)	-0.0052 (0.0110)
AGESQ	-0.0001 (0.0001)	-0.0002 (0.0001)	-0.00001 (0.0001)	0.00001 (0.0001)	0.0001 (0.0001)	0.0002** (0.0001)	-0.0001 (0.0001)	0.0001 (0.0001)
INC1	-0.6831 (0.0721)	0.1167 (0.0894)	-0.0503 (0.0710)	0.0701 (0.0857)	0.0429 (0.0924)	-0.0645 (0.0868)	0.0153 (0.0987)	0.0922 (0.0928)
INC2	-0.0926 (0.0687)	-0.0191 (0.0770)	-0.0059 (0.0754)	-0.0426 (0.0802)	0.0927 (0.0937)	-0.0675 (0.0883)	0.1186 (0.0969)	0.1630* (0.0937)
INC3	-0.1008 (0.0712)	-0.0387 (0.0794)	-0.0701 (0.0710)	-0.0851 (0.0815)	0.0209 (0.0986)	-0.1843** (0.0808)	0.2546** (0.0950)	0.1248 (0.1004)
INC4	-0.0764 (0.0756)	-0.0587 (0.0813)	-0.1241* (0.0639)	-0.0178 (0.0912)	0.0111 (0.1026)	-0.1581* (0.0856)	0.2911*** (0.0937)	0.2304** (0.1048)
SECED	0.0716 (0.0505)	0.1995*** (0.0610)	0.1102** (0.0490)	0.0791 (0.0672)	0.0378 (0.0811)	0.0299 (0.0658)	-0.0131 (0.0801)	-0.1043 (0.0832)
TERED	0.0249 (0.0923)	0.1071 (0.1377)		0.1219 (0.1449)	0.1068 (0.1586)		-0.0622 (0.1591)	-0.2262 (0.1572)
Observ.	262	254	255	269	272	255	268	270
Pseudo R2	0.0336	0.0968	0.0969	0.0327	0.0297	0.0558	0.1149	0.0251
Log likelihood	-97.7199	-122.1491	-95.3676	-140.4667	-175.5629	-117.8230	-151.9957	-181.0408

Notes: standard errors are presented in parentheses.
***,**,* denote statistical significance at 1%, 5% and 10% levels, respectively.

The coefficient estimates for *FEMALE* variable are found as statistically significant in several models, implying that gender is related with various reasons of not having an account at a financial institution in Turkey. In particular, the coefficient estimates of gender are significant with negative signs for 'too expensive', 'lack of documentation' and 'lack of money', while it turned out as positively significant for 'family member'. This latter result implies that women are less likely to need an account at a financial institution if a family member has already one. Therefore, as expected, the presence of another account in the family seems to have an important impact on women, which bodes well with the cultural norms and the prominent role of men in Turkish family structure. On the contrary, high costs of opening an account, documentation requirements and insufficient cash earnings appear to be less important barriers for women as regards having an account. These findings are not surprising given the women's low levels of financial literacy and labor force participation in Turkey.

Age of the individual seems to play no important role in explaining the motives of financial exclusion, since just in model (VI), in which the reason for being unbanked is described as 'religious reasons', coefficient estimates of *AGE* and *AGESQ* are found to be statistically significant, with negative and positive signs respectively. Interestingly, this result implies that religious reasons seem to be a decreasing problem for older people. Put differently, younger population is more sensitive to religious concerns as regards with having an account in Turkey.

As regards with education, dummy variables for the *SECED* are positive and significant when explaining 'too expensive' and 'lack of documentation', while coefficient estimates of *TERED* variable are statistically insignificant for all models.[5] As educational attainment increases, one is on average more likely to be sensitive to pricing of the financial services and documentation requirements. More specifically, 'too expensive' and 'lack of documentation', which are both involuntary self-excluded barriers, are stronger obstacles for individuals with secondary degree when compared with the base category of primary education or less. This finding implies that adults with secondary education tend to have proper knowledge about the documentation needed to open an account, while the price elasticity of demand to formal financial services tends be higher for this group. As no significant relationship is reported for any of the reasons for not having an account and *TERED* dummy variable, one can

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5 In table 8, the coefficient estimates for TERED cannot be reported for models (III) and (VI). The two-way tabulation of individuals which hold tertiary degree or more versus respondents reporting 'lack of documentation' and 'religious reasons' as barriers for financial inclusion reveal that these reasons are not being cited among individuals with tertiary education. As a result, the coefficient estimates cannot be computed for.

conveniently argue that none of these barriers are perceived as challenges among individuals with tertiary and higher education.

As illustrated in Table 8, income is found to have no association with 'too far', 'too expensive', 'lack of trust' and 'lack of money'. Instead, 'religious reasons' and 'family member' seem to have an impact on the individuals in the third and fourth income quintiles, but in opposite directions. In particular, the positive coefficient estimates of *INC3* and *INC4* in Model (VII) indicate that another family member having an account represents a barrier to financial inclusion for the middle income individuals and 20 percent of individuals just below the richest segment. On the contrary, religious concerns seem to be less problematic for the individuals in the third and fourth income quintiles. Moreover, the results displayed in Model (III) suggest that documentation requirements do not play an important role in explaining financial exclusion, as the dummy variable for *INC4* is significantly negative. Considering 'no need for financial services', estimation results as regards with income seem to be quite mixed in terms of significance, as the dummy variables for *INC2* and *INC4* are positive and statistically significant, whereas *INC1* and *INC3* are reported as statistically insignificant. Hence, these results render any solid conclusions skeptical for that case.

Overall, these findings altogether point out that the involuntary self-reported barriers of 'too far' and 'lack of trust' appear to have no association with any of the individual attributes. Among individual characteristics, gender emerged as the most significant characteristic in explaining reasons for not having a formal account, whereas age is only found to have an impact on religious concerns. Furthermore, education and income appear to be associated with different motives for financial exclusion. In sum, it seems that each one these individual characteristics appears to be significant in explaining different voluntary and involuntary self-reported barriers behind financial exclusion in Turkey, which could provide useful insights for policy building.

Conclusion

According to the World Bank Global Findex data, the proportion of Turkish adult population who had an account at the formal financial institution stands at 68 percent in 2017. While this figure stands close to the world average of 67 percent, it is remarkably low when compared with that of most of the OECD member countries and the average of upper middle income countries. Evidently, a better understanding of the level and determinants of financial inclusion in Turkey is at utmost importance to expand financial services to all and facilitate further development goals.

As for the Turkish economy, there are just a couple of papers that focus on financial inclusion issue. In this regard, this study aims to contribute to the scant literature on financial inclusion in Turkey by placing special emphasis on how individual attributes impinge on different dimensions of financial inclusion and on barriers among the financially excluded population. Using 2017 Global Findex data set, a multivariate probit analysis is utilized to explore the predictive power of several factors on financial inclusion.

The findings of the probit analysis provide a profound characterization of financial inclusion patterns in Turkey. The probability of being financially included increases with age, educational attainment and income level, however the probability is lower for females. While these individual attributes have an important role in explaining financial behavior, the way they impinge on the usage of financial services vary by the financial inclusion indicator. More specifically, individual characteristics seem to have stronger impact on bank account ownership and formal saving. Among these individual attributes, age and gender, in particular, appear to be significant in explaining further dimensions of financial inclusion, yet education emerges as the most powerful predictor when the marginal effects are considered. Moreover, the empirical analysis elucidate that mobile banking is driven by identical individual characteristics with that of other traditional formal financial services usage. Particularly, similar findings and interpretations apply for results as regards with the formal borrowing.

Proceeding with motives for financial exclusion, an initial look at the descriptive statistics of reasons for not having an account displays a notable pattern. That is to say, voluntary reasons seem to be the dominant factors in contributing to large segment of population that are financially excluded. When the results of the econometric model, which aims to scrutinize how the individual attributes impinge on barriers for not having a formal account, are considered, each one of the individual attributes seems to be significant in explaining different voluntary and involuntary self-reported barriers behind financial exclusion in Turkey. Among these individual characteristics, gender emerged as the most significant characteristic in explaining reasons for not having a formal account, whereas age is only found to have an impact on religious concerns. Further, education and income are found to be associated with different motives for financial exclusion.

Finally, the findings of this study could help foster a better policy to enhance financial sector outreach by demonstrating how various individual characteristics have an impact on financial inclusion. It is evident that besides expanding the usage of formal financial services by dismantling barriers related with income and education, inclusion of women to the formal financial system are of great concern. In that respect, several policies could be designed to promote women's financial inclusion such as increasing formal education for all

educational levels, increasing employability potentials of females by enacting and enforcing prohibitive law against discrimination, doing campaigns to raise awareness about financial products and access to financial service providers. Moreover, further policy measures may be adopted to favor youth financial inclusion.

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Appendix
Survey Questions Used in the Analysis

Name	Question
female	Respondent is female
age	Respondent age
educ	What is your highest completed level of education?
inc_q	What is your total monthly household income in [insert local currency], before taxes? Please include income from wages and salaries, remittances from family members living elsewhere, farming, and all other sources.
account_fin	Composite indicator (Has an account at a financial institution)
account_mob	Composite indicator Has a mobile Money account)
saved	Composite indicator (saved in the past year)
borrowed	Composite indicator (borrowed in the past year)
fin11a	Please tell whether each of the following is a reason why you, personally, do not have an account at a bank or another type of formal financial institution. Is it because financial institutions are too far away?
fin11b	Please tell whether each of the following is a reason why you, personally, do not have an account at a bank or another type of formal financial institution. Is it because financial services are too expensive?
fin11c	Please tell whether each of the following is a reason why you, personally, do not have an account at a bank or another type of formal financial institution. Is it because you don't have the necessary documentation?
fin11d	Please tell whether each of the following is a reason why you, personally, do not have an account at a bank or another type of formal financial institution. Is it because you don't trust financial institutions?

fin11e	Please tell whether each of the following is a reason why you, personally, do not have an account at a bank or another type of formal financial institution. Is it because of religious reasons?
fin11f	Please tell whether each of the following is a reason why you, personally, do not have an account at a bank or another type of formal financial institution. Is it because you don't have enough money to use financial institutions?
fin11g	Please tell whether each of the following is a reason why you, personally, do not have an account at a bank or another type of formal financial institution. Is it because someone else in the family already has an account?
fin11h	Please tell whether each of the following is a reason why you, personally, do not have an account at a bank or another type of formal financial institution. Is it because you have no need for financial services at a formal institution?
fin15	In the past 12 months, have you, personally, saved or set aside any money to start, operate, or grow a business or farm?
fin16	In the past 12 months, have you, personally, saved or set aside any money for old age?
fin17a	In the past 12 months, have you, personally, saved or set aside any money by using an account at a bank or another type of formal financial institution ? (This can include using another person's account)
fin17b	In the past 12 months, have you, personally, saved or set aside any money by using an informal savings group/club such as [local terminology for savings group/club] or a person outside the family)?
fin19	Do you, by yourself or together with someone else, currently have a loan you took out from a bank or another type of formal financial institution to purchase a home, apartment, or land?
fin20	In the past 12 months, have you, by yourself or together with someone else, borrowed money for health or medical purposes?
fin21	In the past 12 months, have you, by yourself or together with someone else, borrowed money to start, operate, or grow a business or farm?
fin22a	In the past 12 months, have you, by yourself or together with someone else, borrowed any money from any of the following sources? - From a bank or another type of formal financial institution
fin22b	In the past 12 months, have you, by yourself or together with someone else, borrowed any money from any of the following sources? - From family, relatives, or friends
fin22c	In the past12 months, have you, by yourself or together with someone else, borrowed any money from any of the following sources? - From an informal savings group/club such as [local terminology for savings group/club]