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An Econometric Investigation into the Role of Consumer (Mis)Trust in Financial Service Use and Realisation of Enhanced Financial Health

Submitted by

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The candidate confirms that the work submitted is his own and that appropriate credit has been given where reference has been made to the work of others.

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Overall Thesis Abstract

Our thesis work considers an empirical investigation into the nascent financial systems of the Sub-Saharan African region. Specifically, we consider the interaction between consumers and service providers in financial service use and realisation of household financial health. We consider evidence from the Kenyan financial system. In the first part, we consider the determinants of (mis)trust in financial services. In this chapter, we employ a multivariate probit model. After establishing the determinants of consumer (mis)trust in financial services, in chapter three we explore the role of consumer (mis)trust in financial institutions in financial service utilisation. In this work, we use the bivariate probit model. We establish that consumer (mis)trust in financial institutions has a key role in consumer use of appropriate financial services. Lastly, in chapter four, we investigate the enablers and barriers to consumer realisation of financial health in the Kenyan financial system. Financial health is a good proxy for assessing the impact of the financial sector on economic agents, especially households. In this empirical analysis, we employ the financial health index, a new dimension or concept in the latest FinAccess Survey.

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CHAPTER I

I-GENERAL THESIS BACKGROUND, MOTIVATION AND OBJECTIVES

I-1.0 Introduction

In extant literature (Mohan, 2006; Rioja and Valev, 2004; Benhabib and Spiegel, 2000; Levine et al., 2000; Bencivenga and Smith, 1991; Acemoglu and Zilibotti, 1997; Rajan and Zingales, 1998; Shleifer and Vishny, 1997; King and Levine, 1993; Greenwood and Smith, 1996; Pagano, 1993), financial development has been established to have a positive impact on economic growth. It has been argued that, at the country level, there several channels that are important to the Sub-Saharan African (SSA) region through which financial development affects growth. Firstly, financial development affects growth through facilitating domestic and foreign savings mobilisation as well as supporting the efficient allocation of capital in the economy. King and Levine (1993) in the same vein establish that financial development further increases total factor productivity. Secondly, in Greenwood and Smith 1996, they observe that it makes the exchange of goods and services smooth. Thirdly, financial development supports improved risk management (Obstfeld 1994). Fourthly, enables information generation and good corporate governance in firms (Grossman and Hart, 1980; Shleifer and Vishny, 1997).

Further, financial development enables a reduction in transaction and monitoring costs, lowering of information asymmetries, and accommodates diversification of risk while ensuring that different investment projects are allocated to the much-needed resources through improved allocation techniques (Levine, 1997). Additionally, when it comes to risk management, financial development enhances resilience in the economy by offering a variety of financial instruments that economic agents (households and firms) can utilise to shield their interests against adverse shocks. It is further argued that the transmission mechanism of monetary and fiscal policies can be strengthened through sound financial systems in the economy. This is because sound financial systems lead to efficient information sharing and diversification of financial instruments by players in the financial system. Finally, an inclusive financial system has the ability to reduce inequality of opportunities by economic agents (households and firms).

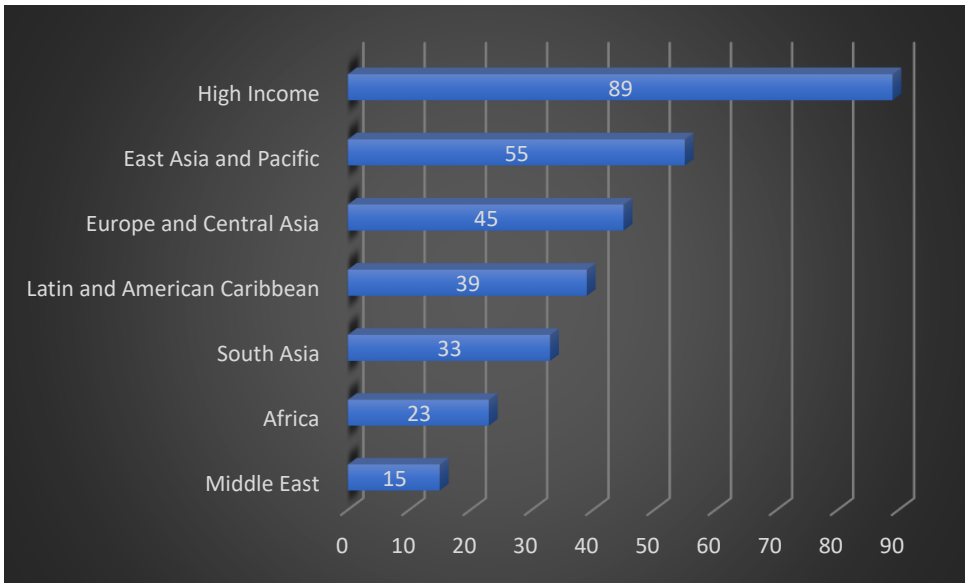
In the current literature (Sahay et al., 2015; Arcand et al., 2012; Ceccheti and Kharoubi, 2015), the positive relationship between financial development and economic growth is established to have a threshold beyond which the impact is said to become detrimental. However, the threshold does not apply to the Sub-Saharan Africa region as all the countries are far away from the upper limit of the threshold (Ikhinde, 2015). Therefore, the region is still in the green zone and will enjoy the benefits that come with enhanced financial development and financial inclusion.

At the individual level, it has been postulated (Ledgerwood et al., 2013; Koku, 2015; Chibba, 2009; Levine, 1997) that an inclusive and well-developed financial sector facilitates increased access to financial services in the economy, thereby, resulting in improved consumer living standards through appropriate utilisation of financial services such as savings, insurance services, credit, and risk-free money transfers in the economy. Sociological and microeconomic studies have established that financial inclusion for women produces better welfare results in the economy (Ostry et al., 2014; World Bank, 2014; International Monetary Fund, 2015). With the highlighted potential impact that comes with financial development through financial inclusion, many African countries and international development organisations have over the years embarked on initiatives aimed at promoting this phenomenon to achieve economic growth and ultimately alleviate poverty in the region.

In the above sections, we have highlighted the postulated potential positive contribution of financial sector development to economic growth as argued by many scholars in the extant literature. In this argument, one major assumption that is made is that economic agents (businesses and households) have access to, and utilise appropriate financial services in the economy. Access to financial services by economic agents is argued (Mohan, 2006; Chibba, 2009; Manji, 2010; Kpodar and Andrianaivo, 2011; Unnikrishnan and Jagannathan, 2014) to be a precondition in the realisation of economic growth from financial sector development. However, this assumption does not hold in most developing countries such as the Sub-Saharan African region which has low levels of financial

inclusion. Figure 1 below offers a comparison of the SSA region and other regions in account penetration[1]. As can be observed, apart from the Middle East, the SSA region has the lowest levels of financial inclusion, as measured through account penetration percentage.

Figure 1: Account Penetration (%Adults)



Source: Demirgüc-Kunt and Klapper, 2012

When broken down into further African regions, the Southern part of Africa has 42 percent account penetration, Western Africa has 23 percent, Eastern Africa scored 22 percent, Northern 20 percent, and Central Africa at 7 percent. Other financial inclusion indicators offer the same picture (low access to financial services) as will be discussed in the section on the state of financial inclusion in the SSA region (Demirgüç-Kunt and Klapper, 2012).

[1] One of the indicators of formal financial inclusion.

Therefore, many countries in the SSA region have over the years embarked on initiatives aimed at increasing financial inclusion through addressing some of the underlining barriers to inclusive access to financial services. In spite of these initiatives, uptake especially for formal financial services (such as bank services) has not increased substantially as highlighted in figure 1 above and section 1.3 below.

In the recent past, Sub-Saharan African region countries have made encouraging progress in financial inclusion initiatives (World Bank, 2017; European Investment Bank, 2016). For example, the region witnessed a marginal increase in commercial bank branches of 3.7 to 5.3 per 100,000 adults between 2012 and 2016. For comparison, 9.8 branches per 100 000 adults were recorded in 2016 by the group comprising of low and middle-income nations. Therefore, the region still has some work to do. Looking at depositors, the SSA region recorded an increase of 292.1 depositors per 1000 adults in the period 2012-2015 compared to low and middle-income nations' average of 742.6. In terms of borrowers, the SSA region witnessed 34.7 borrowers per 1000 adults in 2015 relative to the average of 105.9 per 1 000 adults that was achieved by low and middle-income countries in the same year. Further, the last parameter of Domestic credit to the private sector by banks, the SSA region still scores low relative to the low and middle-income group. The region scored 31.8% of GDP in 2017 in this indicator compared to 104.9% recorded by the low and middle-income countries. A further narrow down into this indicator, highlights that, only 22.9% of businesses reported using banks to finance their investment in

2017, compared to 29.1% for low and middle-income countries (World Bank, 2017).

Further, the Sub-Saharan African region has been considered a world leader in financial service innovation based on mobile phone platforms. These innovations have been mainly driven by the countries in the East of Africa, prominent among them being Kenya. In Kenya, the financial sector witnessed a reduction in service transaction costs and facilitation of personal transactions outside the traditional financial system emanating from the systemic spread of mobile money services[2] (European Investment Bank, 2016; 2017). However, as demonstrated in sections above, the SSA region still largely lags behind other regions of the world when it comes to the overall financial inclusion agenda. Against this background, we seek to contribute to the body of knowledge by exploring the interaction between financial service providers and consumers, with a special focus on the role of (mis)trust in financial institutions in consumer service utilisation and financial behaviour.

The remaining sub-sections of this chapter will consider the following parts: operational definitions of the main concepts in the thesis, the state of financial inclusion in the Sub-Saharan African region, thesis motivation, objectives, and key questions, and lastly, the structure of this thesis paper.

[2] Services that are provided by Telecommunications companies. These services include: M-Pesa (transfer and payments platform) and M-Shwari (insurance service).

I-1.2 Definition of Key Terms and Concepts

In this section, we offer operational definitions for key concepts considered in our thesis. The rest of the terms and concepts are considered in the specific chapters where they are more relevant.

I-1.2.1 Financial Inclusion

According to the African Development Bank (2013), "Financial inclusion refers to all initiatives that make formal financial services available, accessible and affordable to all segments of the population. This requires particular attention to specific portions of the population that have been historically excluded from the formal financial sector either because of their income level and volatility, gender, location, type of activity, or level of financial literacy".

Ravallion (2014) argues that a financial system can be said to be inclusive if it allows for broad access to financial services without price or non-price barriers. When financial systems are not inclusive, marginalised segments of the population such as women, youth and low-income households will resort to their limited savings for educational investment or consider becoming entrepreneurs. Ravallion (2014) further argues that persistence in income inequality is to some extent as a result of financial exclusion.

Literature has shown that financial inclusion has a multiplier effect on a country's economy as a whole. This is realised through an increased pool of savings from the big proportion of the population at the bottom of the pyramid (Koku, 2015). The formal financial system can be used in facilitating improved participation of unbanked individuals in the economy, thereby, resulting in improved financial conditions, enabling them to generate financial assets, earn income, improve their risk management initiatives and ultimately improve their living standards (Koku, 2015; Chibba, 2009; Levine, 1997).

In exploring the issue of financial inclusion (or financial exclusion) literature has defined and categorised it in the broader issue of societal inclusion (or exclusion). Leyshon and Thrift (1995), postulated that processes that facilitate impediment of certain segments of a social group and persons from accessing the formal financial sector can be referred to as financial exclusion. Lastly, the United Nations in its blue book, "*Building Inclusive Financial Sector for Development*" refers to financial inclusion as "The access to credit for all 'bankable' people and firms, to insurance for all insurable people and firms, and savings and payment services for everyone" (United Nations, 2006).

I-1.2.3 Access to Financial Service vs Usage

In looking at the difference between financial access and use, our work considers Claessens (2006) argument. The model argues that access simply refers to the availability of financial services of reasonable quality and cost, where both reasonable quality and cost are relative to some objective standard. In the Claessens (2006) model, three categories are considered as follows: I) individuals with access and use of financial services; II) individuals with access, but who do not want to use financial services (voluntary exclusion) in the financial system, and lastly, individuals who are involuntarily excluded because they have no access to financial services. Segment (II) consists of individuals with characteristics such as no financial awareness, expected rejection (inability to use due to price/income). We argue that our key explanatory variable in chapter two, (mis)trust belongs to this group. The Claessens model is considered in detail in chapter two of our work.

I-1.2.3 Formal vs Informal Financial Access

When it comes to the classification of the type of financial services between formal and informal, registration and regulation of provider are used. Formal financial services are said to be those offered by financial service providers that are formally registered and prudentially regulated by independent statutory bodies in the financial sector. Examples of such providers include commercial banks, insurance companies, and microfinance institutions. Therefore, all individuals that use such types of financial services exclusively are said to be formally included in the financial system.

On the other hand, financial services offered by non-regulated financial bodies but with a well-organised structure such as leadership and governing document(s) are said to be informal. These services include, informal savings groups, Accumulating Savings and Credit Association (ASCAs), shop lenders, and Rotating Savings and Credit Associations (ROSCAs). Therefore, consumers who use these services exclusively are said to be informally included in the financial system.

Lastly, semi-financial services are those provided by service providers that are subject to non-prudential oversight by government departments/ministries with focused legislations or statutory agencies. Semi-formal financial services include money services (sending, saving and receiving via mobile platforms).

More examples of the different types of financial services considered in our work can be found in appendix two of chapter one appendix section.

I-1.2.4 Access of Financial Services by Consumer Characteristic

In this section, we outline access to financial services in the three financial service types disaggregated by the following characteristics: Gender; location (rural/urban); age; education level; wealth quintile; and livelihood.

Table 1: Financial service access by consumer characteristics

Characteristic	Financial service used (%)			Excluded (%)	Characteristic	Financial service used (%)			Excluded (%)
	Formal	Semi-formal	Informal			Formal	Semi-formal	Informal	
1. Gender					**4. Education**				
Men	50	28.9	4.5	16.2	Tertiary	88.9	9.0	0.4	1.6
Women	34.6	36.1	10.5	18.2	Secondary	57.3	31.1	3.0	8.6
Location					Primary	31.5	41	9.4	18.1
Urban	59.9	26.2	4.5	9.5	No education	10	26.1	17.4	46.2
Rural	32.1	36.3	9.6	22	**5. Wealth quintile**				
2. Age					Wealthiest	79.3	15.4	1.1	4.3
>55 years	32.3	28.8	10.6	28.4	Middle wealthiest	39.0	40.6	7.3	13.1
46-55 years	44.1	33.5	7.4	14.9	Poorest	10.0`	30.8	17.2	42.0
36-45 years	47.1	33.9	6.7	12.4					
26-35 years	49.5	32.8	6.8	10.8					
18-25 years	35.6	33.7	7.8	23.1					
3. Livelihood									
Dependent	30.3	33.6	8.9	27.2					
Own business	55.9	30.5	6.6	6.9					
Employed	78.9	17.2	1.3	2.6					

In Table 1, we observe that access to the different types of financial services varies by the key characteristics highlighted in the table. When it comes to gender, we observe that a large proportion of men use formal financial services and are less excluded relative to women. Further, we notice that women use semi-formal and informal financial services more than men. In terms of geographic location, we observe that rural dwellers are more excluded, use less formal financial services, use more of semi-formal and informal services relative to their urban counterparts.

Considering the disaggregation by age, we establish that the age group 18-25 are more excluded and use more informal financial services than all

other age groups in the table. This makes sense as this age group is more likely to be unemployed, dependent hence relying on informal services such as borrowing money from friends, handouts from relatives, services from informal financial groups. The age groups 26-35 years and 36-45 years use the largest proportion of formal financial services and are the least excluded compared to the rest of the age groups. This might be due to the fact that these age groups are the more economically viable, educated, and are usually urban dwellers.

When it comes to livelihood, individuals who own a business and those who are employed use a larger proportion of formal financial services and are the least excluded from the financial system relative to the dependent category. This is most likely due to the fact that these individuals have an income, need a formal process such as registration of companies (for business owners) and work registration process (for the employed), hence, they are likely to use formal financial services more. On the other hand, dependents have the highest level of exclusion from the financial system and use informal financial services more than the other two categories. The reasons for this occurrence are similar to those given on the 18-16 years' age group who mainly make up the dependent category.

In terms of education, we observe that those with tertiary education and secondary education have a large proportion of formal financial service use and are less excluded compared to the primary education category and those who have no education. Reasons for this are similar to those highlighted in the employed and business owner categories in the preceding section. The individuals without formal education have the

lowest use of formal services, the highest proportion of informal financial service use, and the highest proportion of excluded individuals from the financial system relative to the rest of the education categories. This makes sense as these individuals are more likely to be informally employed, own small informal businesses, hence, depend on community networks for their financial management mechanisms.

Lastly, using a wealth quintile index (based on household assets), we observe that, those who are established to be in the wealthiest and middle wealth category use a large proportion of formal financial services and are the least excluded from the financial system compared to those the in the poorest category. Again, reasons for this occurrence are similar to those detailed on tertiary education, employed, and business owners.

I-1.3 State of Financial Inclusion in Sub-Saharan African Region

In our thesis, we consider the case of Kenya in our empirical estimations. However, in this section, we spend some time highlighting the size of the financial inclusion problem in the Sub-Saharan African region. Understanding the financial problem in SSA is very important as our results will have an influence on policy and project intervention design, especially that other countries in this region usually replicate service innovation and financial systems processes pioneered by Kenya. A more detailed motivation on the selection of the Kenyan financial system as our case will be highlighted in sections to come.

When it comes to access to novel or traditional financial products and services such as banking services, the Sub-Saharan African region remains low relative to other developing regions. This is especially so for the marginalised section of society such as poor people in rural areas, the uneducated, youth, and women. The Sub-Saharan African region has a low proportion of the population with an account and or borrowing from financial institutions. Ensuring that the aforementioned segments of the population have access to financial services in the market has a significant potential of reducing the income inequality gap. In the Eastern part of the region, mobile payment systems and mobile banking services which are now also being considered as novel financial services are to some extent compensating for these gaps.

For example, in Kenya, the widespread and replication of financial systems such as the M-Pesa[3], M-Shwari and M-Kopa has led to a reduction in transaction costs, supported personal transactions, and has been key in the facilitation of improved use of financial services in the Kenyan financial market. Nevertheless, as these services compensate for the gap, there is a need of expanding the coverage of these financial services further so as to ensure that a larger proportion of the population has access.

Additionally, Microfinance institutions (MFI) have an important role in the provision of financial services in the Sub-Saharan African region. These institutions mainly target low-income populations, facilitating their smoothing of income and consumption expenditure. These services complement mobile banking services in efforts of expanding financial inclusion in this region (Sahay et al., 2015, IMF, 2012 Report). MFIs target low-income households that have little or no collateral to use in accessing credit facilities from formal financial institutions such as banks. In this regard, MFIs have been key in the significant enhancement of financial inclusion in the Sub-Saharan African region through mobilisation of savings and to some extent credit provision especially in rural areas (Sahay

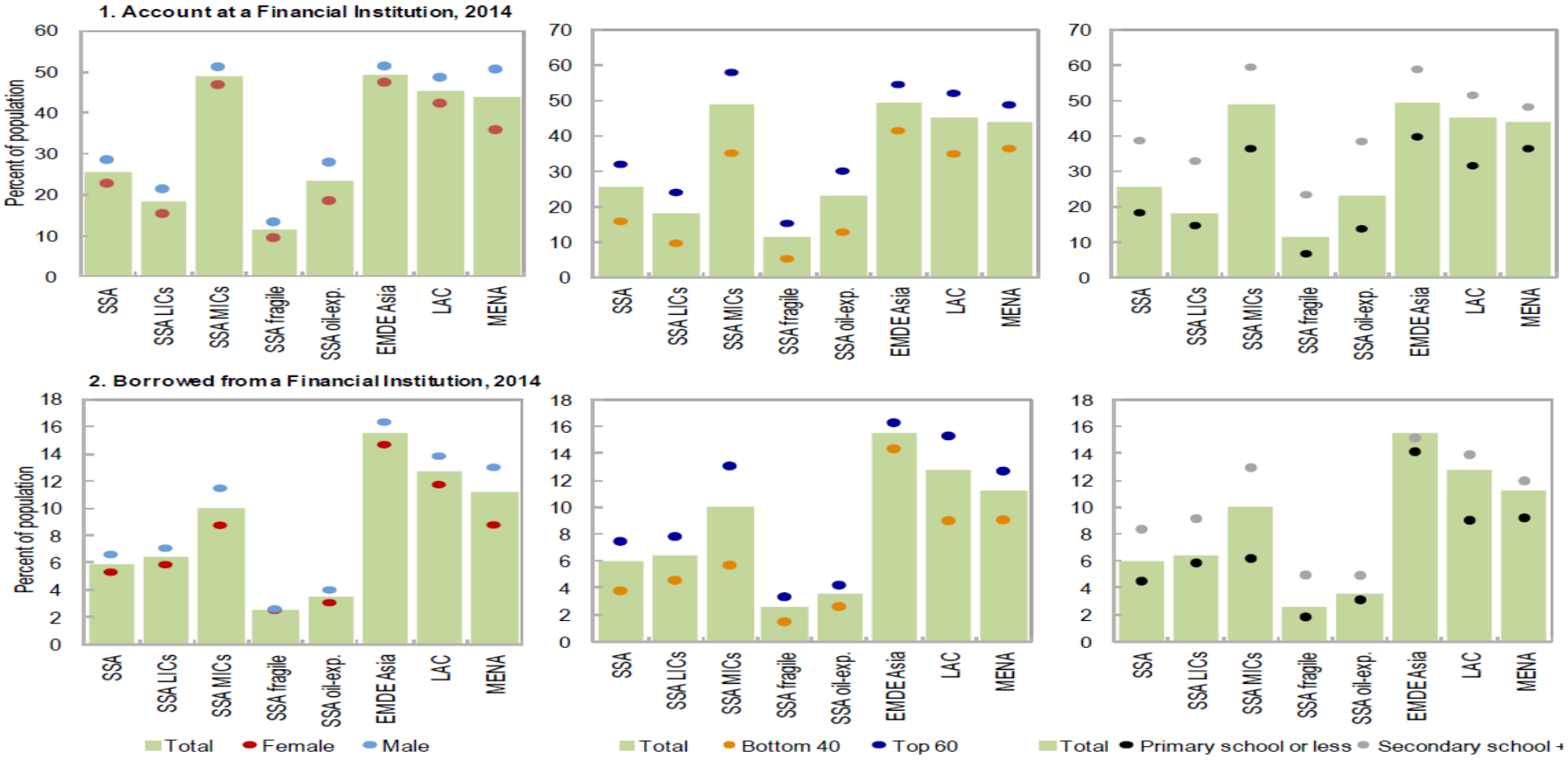
[3] M-Shwari and M-Kesho are easy to use banking systems that allow consumers to save, earn interest and access small credit facilities using the mobile phone platform. On other hand, M-Kopa is a provider of mobile money services —they initially started as a firm that was concentrated on supply of small solar systems to rural communities, allowing them to make small or micro daily payments. They eventually branched into mobile money services after identifying the business case catering for such a population segment.

et al., 2015). The two aforementioned financial services have been established to be complementary financial services in the region.

The undesirable low access to financial services in this region can be attributed to both supply and demand-side limitations. In terms of supply limitations, a lack of infrastructures such as collateral registries, lack of sufficient information on consumers of credit (such as credit history and credit risk), and difficult contract enforcement are the main barriers of bank lending to the private sector. In fragile nations such as the Central African Republic, Comoros, and Guinea-Bissau, infrastructure is a major limitation to access to financial services. This lack of infrastructure is evidenced by the scarce availability of ATMs and financial branches. These fragile countries are usually characterised by less than seven ATMs and less than three financial branches per 100,000 persons.

On the demand side, factors such as low financial literacy levels, high levels of unemployment, low household income, cultural norms, identifying as a minority, and financial information gap are deemed to explain the low access to financial services in this region (Carpena et al., 2011; Bönte, 2008; Bachman and Lane, 1996; Demirgüç-Kunt and Klapper, 2012; Claessens, 2006; Rojas-Suarez and Gonzales, 2010; Beck and Brown, 2011).

Figure 2: Financial Inclusion Indicators: SSA and regions



Source: World Bank 2014; IMF, 2015 and Global Findex 2014

Note: EMDE Asia = emerging market and developing Asia; LAC = Latin America and the Caribbean

LIC = low-income countries; MENA = Middle East AND North region; SSA = Sub-Saharan Africa

Table 2: Financial Inclusion Indicators: SSA and Developing Countries (*as %)*

Financial Access (as % of population, age 15+)	**Sub-Saharan Africa**			**Developing Countries**		
Account*	23	34	43	42	55	63
Financial institution account	23	29	33	42	54	61
Saved at a financial institution	14	16	15	17	22	21
Debit card ownership	15	18	18	24	32	40
Credit card ownership	3	3	3	7	10	10
Borrowed from a financial institution	5	6	7	8	9	9
Borrowed from family or friends	40	42	31	26	29	29

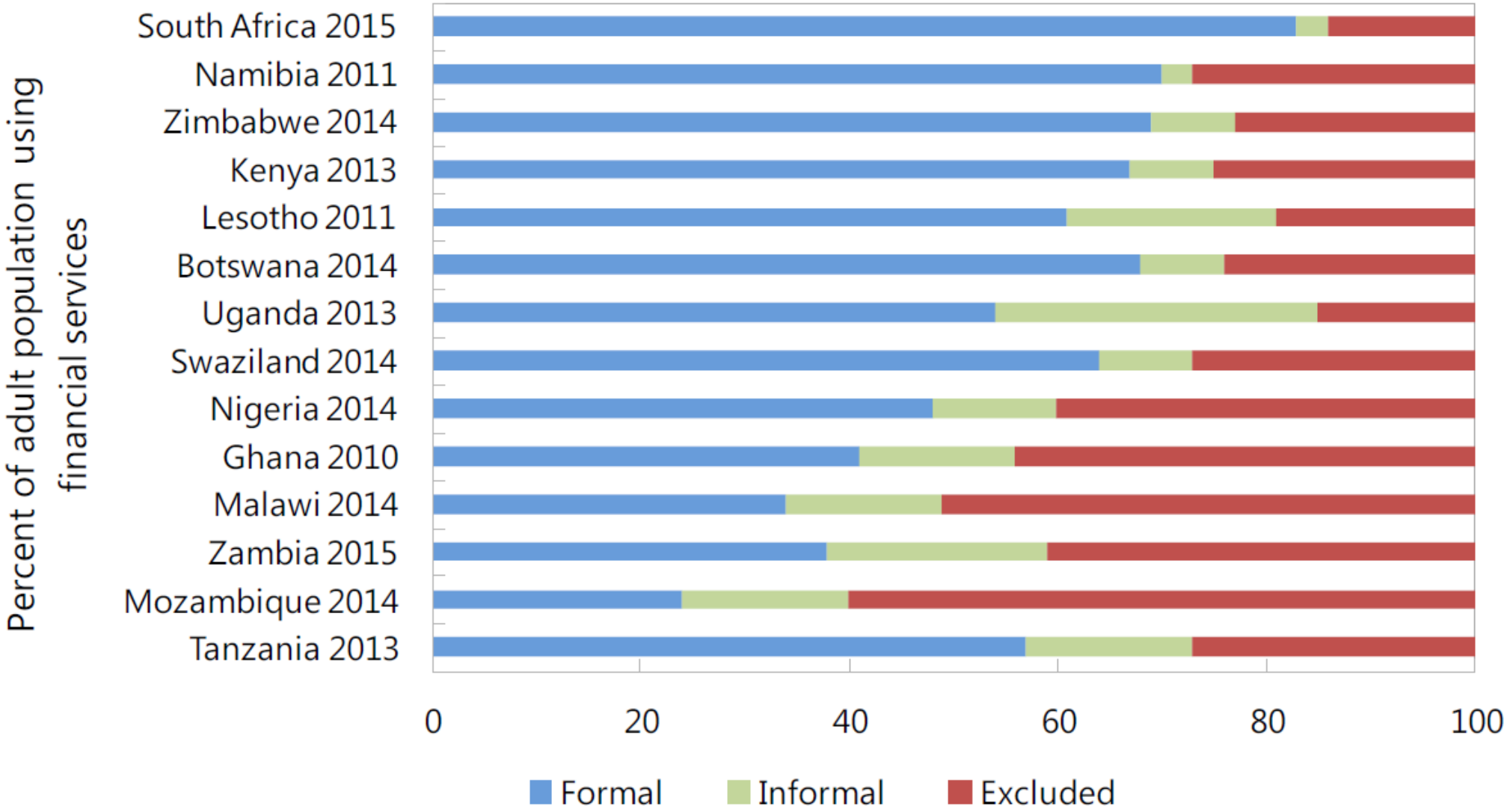
Source: Global Findex

*[4]

As can be seen from figure 1 and table 2, the SSA region has low score in financial inclusion indicators relative to other regions (European Investment Bank, 2016). This reinforces the case for improved understanding of the current occurrence in order to facilitate informed policy and intervention designs for this region's financial systems.

[4] * According to the Global Findex, account ownership is considered as having a jointly owned or an individual account either at a financial institution (account at a bank or another type of formal, regulated financial institution, such as a credit union, a cooperative or microfinance institution) or through a mobile money provider (mobile phone-based services, not linked to a financial institution, that are used to pay bills or send or receive money.)

Figure 3: Sub-Saharan African Countries: Financial Inclusion



Source: IMF, 2015; FinMark Trust and FinScope Surveys

Figure 2 and 3 offers a depiction of financial inclusion levels in the SSA region. Additionally, the figure also demonstrates the important role that the informal financial system plays in the financial inclusion agenda. All the three above representations of financial inclusion in the SSA region demonstrate that the region has low levels of financial inclusion.

I-1.4 Overall Thesis Relevance and Motivation

Given the postulated positive effect of financial development on economic growth, especially at the macro level, there is relevance in investigating the status of financial inclusion in the SSA region. This region, as indicated in the above sections, is characterised by low scores in most of the key financial inclusion indicators relative to other regions. Therefore, many studies (Carpena et al., 2011; CBK and FSDK, 2015; Bönte, 2008; Bachman and Lane, 1996 on Demirgüç-Kunt and Klapper, 2012; Rojas-Suarez and Gonzales, 2010; Beck and Brown, 2011; Dupas et al., 2012; Medina et al., 2017) have been conducted aimed at understanding the major barriers to financial service utilisation in the Sub-Saharan African region. This literature has focused on both the demand and supply-side constraints. Over a long period of time, literature mainly focused on "economic oriented constraints" to financial inclusion such as the price of services and consumer economic status. However, literature (Beck and De la Torre, 2007; Claessens, 2006; Carpena et al., 2011) focusing on the non-economic factors to utilisation of financial services has started emerging. Additionally, literature has focused so much on mere access which is just the first step and does not entail utilisation and ensure improved consumer welfare as postulated in most theories that argue for the positive impact of financial inclusion on consumers (Claessens, 2006). In this regard, we consider an investigation into utilisation of financial services with a special focus on non-economic factors that influence the interaction between consumers and financial service providers. Non-economic factors are considered to be those that are outside income,

price, employment, and any other similar factors that influence utilisation of financial services (Beck and De la Torre, 2007).

In the first two empirical parts of this thesis, chapters two and three, we contribute to the further understanding of non-economic[5] factors that affect the use of financial services in the SSA region. Specifically, we consider the role of (mis)trust as a factor in consumer financial service utilisation. In our work, we hypothesise that one of the major constraints to developing inclusive financial systems in the Sub-Saharan African region is low trust, emanating from a variety of factors in these nascent financial systems. In our work, only the demand-side mis(trust) will be considered due to the unavailability of data on the supply side. Therefore, future research should seek to model the mis(trust) on the supply-side and develop a framework that combines the two. Nevertheless, in our analysis, we model supply-side explanatory variables to help us understand the influence of supply on this phenomenon.

There is limited literature on the topic of (mis)trust in financial institutions and its role in financial service utilisation, especially at the household level. Additionally, the majority of the studies that have been attempted on this phenomenon have concentrated on novel financial services, formal financial services as provided by commercial banks. In this research piece, we equally focus on informal finance which has become prominent in the SSA region. For example, in Zambia, 40.3 percent and 35 percent of adult women and men respectively utilise informal financial services in the

[5] Factors outside income, price, employment status to looking at socio-cultural factors Beck and de la Torre (2007).

country. And in Kenya, 46 percent were established to use informal financial services in the economy (Zambia FinScope, 2015; CBK and FSDK, 2015). Therefore, understanding this type of financial service is critical in this region. The consideration of the aforementioned financial institution types and services offered is another contribution of this paper to the understanding of the nascent financial systems in this region. It is hoped that once explored, recommendations from this work will facilitate policy and intervention designs that will help in addressing constraints emanating from low trust and hence, improve the levels of access to and utilisation of financial services in the region.

Further, in chapter four, our work seeks to contribute to the understanding of the financial inclusion landscape in the SSA region through the investigation of the impact of access to financial services on consumer welfare. In the current literature, the focus has mainly been placed on the macro impact, relationship between financial sector development, and overall economic growth. Therefore, there is limited research at the micro level (especially at the household level) on the impact of different financial service types on consumer welfare. The few pieces of research that have been conducted consider mainly formal financial services such as commercial bank services. Hence, in this work, we add informal financial service use due to the key role these services play in our region of consideration. This chapter benefits from the new concept of the consumer Financial Health Index which was introduced for the first time in the dataset we employ in this section. Further, due to the diversity of

variables in the survey, we generate a wide range of interesting and new variables in our empirical estimation.

Detailed contributions to the literature and relevance of our work are highlighted in detail in each chapter of this thesis. To the best of our knowledge, the contributions from our research piece claims have not been explored in the current literature.

I-1.5 Thesis Objectives and Questions

As outlined in the introduction above, this thesis seeks to explore the topic of financial inclusion in areas that have not been explored sufficiently. We contribute to the understanding of financial inclusion in Sub-Saharan African region, using evidence from the Kenyan financial system. This financial system has been considered for our case because of its unique attributes that will enable us to understand similar systems in the SSA region. The Kenyan financial market leads in informal financial service innovation such as informal savings groups, mobile money platforms, and in the overall financial inclusion agenda (World Bank, 2012). For example, on the mobile money front, Kenya has more cell phone subscriptions than adult citizens and more than 80 percent of those with a cell phone also use "mobile money (World Bank, 2012). This is the highest use of mobile money services in the world. Further, the Kenyan financial system is considered because there is publicly available robust data (CBK and FSDK, 2015) to facilitate our empirical estimations on all three chapters of our thesis. The available dataset has new and insightful variables that enable us to contribute to the extant literature, influence policy, and project intervention design by financial system players in the region. Of most interest, this dataset has the consumer (mis)trust in financial services that are disaggregated by type of financial institution (CBK and FSDK, 2015). Other countries in the Sub-Saharan African region do not currently have this variable and a few others that were key in our research. Further, our work will be useful for other countries in the SSA region that are on the path of developing their systems to the standards of the Kenyan system,

whose processes and services many of these countries learn from and replicate. With these attributes, the Kenyan financial system was selected in our empirical estimation.

In understanding the financial inclusion phenomenon, we have the following questions to answer using the areas that have not been fully explored: What are the main underlining factors (non-economic) impending further financial development of robust, more inclusive, and viable financial systems that support low-income consumers in the Sub-Saharan African region? How do nascent financial systems in the region interact with low-income households (consumers) in terms of utilisation of financial services (both formal and informal services)? And lastly, what are the enablers and barriers to the realisation of enhanced financial health (improved welfare) from access to, and use of appropriate financial services at household level?

This thesis looks at the following three topics organised as chapters: i) Determinants of consumer (mis)trust in financial institutions ii) Role of consumer mis(trust) in financial institutions in financial service utilisation and; iii) Enablers and barriers to consumer realisation of improved financial health from financial service use. The specific topic objectives are outlined in the section below.

In the first aforementioned topic, captured in **chapter two**, the following objectives are considered: i) Establish determinants of consumer (mis)trust in financial institutions (financial service providers) ii) Investigate whether the determinants of (mis)trust vary across different segments of financial institutions (informal, semi-formal and formal institutions) and; iii) Develop possible policy, project intervention and regulatory implications. In our **chapter three** empirical estimation, the following specific objectives are considered: i) Investigate the role of an individual's (mis)trust in financial institutions in their use of formal and informal services simultaneously ii) Establish whether the type of financial institution trusted (trust formal, semi-formal and informal) has a varying effect on a consumer's use of formal and informal financial services iii) Compare the strength of influence between mis(trust) and other factors that have been modelled to drive financial service use in current literature and; iv) Develop possible policy and regulatory implications. Lastly, in the **fourth chapter**, we consider the following specific objectives: i) Establish the drivers of financial health and investigate if the drivers are moderated by other factors.

I-1.6 Overview of Thesis Results

I-1.6.1 Overview of Chapter 3

Firstly, chapter two of our work aims at investigating determinants of consumer (mis)trust in financial services. Three types of financial institutions are considered: formal, semi-formal, and informal institutions. We employ a multivariate probit model in our empirical estimations. When it comes to individual trust in formal financial institutions, financial literacy, proximity to a financial institution, total household income, accessing financial information from formal channels, and education are established to have a positive impact. Further, female household heads and individuals in rural areas are established to be less likely to have trust in formal institutions. Additionally, single household heads are observed to be more likely to trust formal financial institutions relative to married household heads. In the informal financial institution category, it is established that high financial literacy (measured through financial numeracy and product awareness) and education levels, are significant and present a negative influence on the likelihood of an individual trusting informal financial institutions. On the other hand, proximity to informal financial institutions, belonging to a minority group, and being a female household head is significant with a positive impact on an individual's likelihood of having trust in informal financial institutions. When it comes to semi-formal services, education, and the type of financial institution an individual is close to having a positive and significant influence on their trust in this category of financial institution.

I-1.6.2 Overview of Chapter 2

Secondly, in chapter three of the thesis, we empirically assess the role of an individual's (mis)trust in financial institutions in their financial service utilisation. The chapter findings suggest that a consumer's (mis)trust in financial institutions plays a key role in both formal and informal service utilisation. In our bivariate analysis, trust in all three types of financial institutions (formal, semi-formal, and informal) are established to be significant and with a positive effect when a bundle with both formal and informal services is used. Further, in the scenario with exclusive use of formal services, trust in formal institutions is significant and with a positive effect while trust in informal institutions is established to be significant but with a negative effect on an individual's exclusive use of formal services. On the other hand, in the exclusive use of informal services, trust in informal institutions is observed to be significant and with a positive influence while trusting formal institutions has a negative impact on an individual's exclusive use of informal services. In a scenario where neither formal nor informal services are used, trust in any financial institution (from formal to informal institutions) is established to be significant and with a negative effect. Implying that individuals with trust in any type of financial institution are less likely to be excluded from the financial system. Again, this reinforces the relevance of trust in acceptance and use of financial services in the economy.

I-1.6.3 Overview of Chapter 4

Lastly, in chapter four, we investigate the enablers and barriers of household/consumer realisation of improved financial health (welfare) from financial service use in the Kenyan financial system. The concept of financial health is a different way of looking at the impact of financial service utilisation through the lens of consumer welfare. According to the Kenya Central Bank and FSD Kenya, financial health refers to the ability of Kenyans to use financial services for managing daily needs, protecting themselves from shocks, and helping them achieve their main goals in life. In this chapter, we employed a probit model in our empirical investigation. The interesting part of the estimation was the use of the new concept, financial health, and new informative variables that we generated. The findings suggest that there exists a positive and significant influence from the following explanatory variables: trust in financial services; household income; belonging to a high-wealth quintile; being close to a financial service facility; having a life goal that needs finances and being financially literate. On the other hand, the following have a negative significant effect: being from a minority group; a household with a high dependency ratio; identifying as economically most vulnerable, and another household member using mobile money services.

I-1.5 Structure of the Thesis

The rest of the thesis will be captured in the remaining three chapters. The three chapters will each consider the following sections: brief introduction and motivation; objectives and contributions to literature, literature review, empirical analysis, presentation of results and discussion, and lastly, offer conclusions and policy implications. The first chapter considers the determinants of (mis)trust in financial institutions. In the second chapter, we consider the role of (mis)trust in financial institutions in financial service utilisation. And lastly, we consider the enablers and barriers of household/consumer realisation of improved welfare (financial health) from financial service use. Our thesis paper employs evidence from the Kenyan financial sector.

CHAPTER II

DETERMINANTS OF CONSUMER (MIS)TRUST IN FINANCIAL SERVICES: EVIDENCE FROM KENYA

II-Chapter II Abstract

This chapter aims at investigating determinants of consumer (mis)trust in financial services. We consider three types of financial institutions: formal, semi-formal, and informal institutions. In terms of methodology, the analysis employs a multivariate probit model. When it comes to individual trust in formal financial institutions, financial literacy, proximity to a financial institution, total household income, accessing financial information from formal channels, and education are established to have a positive impact. Further, female household heads and individuals in rural areas are established to be less likely to have trust in formal institutions. Additionally, single household heads are observed to be more likely to trust formal financial institutions relative to married household heads. In the informal financial institution category, it is established that high financial literacy (measured through financial numeracy and product awareness) and education levels, are significant and present a negative influence on the likelihood of an individual trusting informal financial institutions. On the other hand, proximity to informal financial institutions, belonging to a minority group, and being a female household-head is significant with a positive impact on an individual's likelihood of having trust in informal financial institutions. When it comes to semi-formal services, education, and the type of financial institution an individual is close to having a positive and significant influence on their trust in this category of financial institution.

II-CHAPTER BACKGROUND, MOTIVATION AND OBJECTIVES

II-1.1 Introduction

To improve the populations' living conditions in developing countries, governments and policymakers are exploiting new corridors for unconventional viewpoints on the paradigm of economic growth and development. In recent years, one such strategy that has been established to quicken economic growth is financial inclusion. It has been argued (Ledgerwood et al., 2013; Koku, 2015; Chibba, 2009; Levine, 1997) that a well-developed financial sector increases access to financial services in the economy, which further facilitates consumer improvement of living conditions through enabling access to savings facilities, credit, insurance services, and risk-free money transfer by economic agents (households and businesses).

As discussed in the introductory chapter of this thesis, financial inclusion refers to all initiatives by financial sector stakeholders that aim at facilitating the availability, accessibility, and affordability of formal financial services to all segments of the population. It is argued that special attention is required to specific individuals that are historically excluded from the financial system because of factors such as gender, financial literacy levels, income levels, and location of their dwelling (African Development Bank, 2013). Additionally, Ledgerwood et al. (2013) argue that the phenomenon captures access and usage of financial products and services in an enabling regulatory environment that offers consumers systems of protection.

Despite financial inclusion being identified as an effective path to inclusive economic growth, there have been barriers to achieving high levels of financial inclusion in the Sub-Saharan African region. The current literature (Central Bank of Kenya and FSD Kenya, 2013, 2015; Dupas et al., 2012; Claessens, 2006; Schaner, 2013; King, 2012) establishes these barriers on both the supply and the demand side. Some of these barriers on the demand-side include low income/assets, lack of awareness, social exclusion, and low illiteracy levels. On the other hand, supply-side barriers include high cost of financial products and services, unsuitable products, distance from the branch, branch timings, cumbersome documentation, and other procedures, staff attitudes are common reasons for exclusion. The above barriers translate into high transaction costs and lower profitability for the financial institutions. With the above scenario, the financially excluded population is left attracted to informal financial services (savings accounts and credit services) because of their ease of availability, flexibility, and other attractive features. This is notwithstanding the fact that most informal credit is costlier than other sources of credit in most cases.

As will be evidenced in our next chapter, one key factor in financial service utilisation, is consumer (mis)trust in financial services[6]. Until our work, this factor has not been fully explored in the current literature. Specifically, in this chapter, we investigate the determinants of consumer (mis)trust in

[6] Measure through a proxy, financial institution most trusted.

financial institutions. We consider evidence from the Kenyan financial system.

In our empirical estimation, we consider all three types of financial institutions: formal, semi-formal and, informal institutions. Formal finance refers to financial services such as loans and payment methods that are regulated by the central bank or another financial authority. Informal finance, on the other hand, refers to financial services that fall under local regulating structures, native or custom laws, and social group agreements such as community savings groups. Semi-formal financial services are in between the two and mainly capture agency services and mobile money platforms.

This consideration of all the types of financial institutions, hence a variety of financial services offered is critical in the Sub-Saharan African region context, as there is a spread in the type of financial services used. The consideration of the financial institution types, products, and services offered is another contribution of this paper to the understanding of the nascent financial systems in this region.

The rest of the chapter is organised as follows: in the next section, we discuss the definition of trust and the context in which it enters financial transactions, and further outline objectives of this chapter and its contribution to the literature. Thereafter, we consider the empirical analysis: model estimation using the multivariate probit model, and further discussion of results. Lastly, conclusions, potential policy, and project considerations are offered.

II-1.2 Context and Definition of Trust

In this section, we seek to offer a definition and context in which the (mis)trust variable is considered in our empirical analysis.

Considering an individual (investor), they can be said to trust if they voluntarily offer their endowment (resources) to a third party (trustee) void of any legal commitment from them. Further, this act of trust is anchored on the investor's expectation and goal that their investment will earn a return soon. In this scenario, the investor is better off in an event that the trustee is trustworthy, and the reverse is true (Guiso, 2012).

According to Coleman (1990), trust is considered as a behaviour. In this behaviour, the guiding principle is that the trusting individual 'reveals their willingness to accept vulnerability (risk) based upon positive expectations of the intentions or behaviour of the other person (or representative of an organization)'. Meaning, the trust act is facilitated by the expectation that an individual – for instance, a consumer of a financial product places on the provider (supplier of financial service) hoping they will not exploit them by offering a scam, inaccurate information, or misusing their good faith. To put it in another way, the belief that the provider will handle themselves in an honest and fair manner during the transaction with the customer is what drives the act of trusting in the market. Therefore, trust reflects an individual's willingness to accept social risk. Social risk is the risk attached to the possibility of a betrayal from another individual and as a result, incur losses in the process. This risk is not the same as the risk that arises from bad luck, the intrinsic risk that occurs because events in life are subject to chance (Rousseau et al., 1998).

Research has established that people dislike losses that are caused by betrayal as compared to losses that emanate from chance. Trusting behaviour is documented to be highly influenced by betrayal aversion Bohnet et al. (2008). Betrayal aversion reflects a key diversion away from how decision-making given risk has been understood and viewed in the past. Further, Betrayal aversion proposes a fundamental difference between two risks; one as a result of random influence from nature and the other emanating from interpersonal relations with human beings that are characterised by unpredictable actions, of which some may be detrimental. Intuitively speaking, it can be said that individuals are more willing to accept risk given a possibility (probability) of bad luck than trusting in the face of similar a probability of being taken advantage of or cheated. Therefore, betrayal aversion is a key additional barrier to trusting behaviour that puts emphasis on contract enforcement institutions and property rights without consideration of the state, legal or informal (Guiso, 2012).

Additionally, a strong cultural component plays a key role in how much individuals dislike betrayal. In a trust game with a diverse group of people from a sample of six nations (USA, Turkey, Brazil, China, and Oman), the following was established: firstly, all individuals in the sample showed more dislike or aversion to betrayal than to risk. Secondly, the aversion to betrayal was observed to be systematically different across the sampled countries: In countries with formal institutions that are relied upon in contract enforcement, individuals were observed to be less averse to betrayal compared to their counterparts in countries where enforcement

of agreements among individuals rely heavily on interpersonal relations (Bohnet et al., 2008).

From these two features, two key implications arise in an organisation's relations with clients, for instance, a financial institution with its customers (Bohnet et al., 2008). Firstly, a loss caused by abuse of a client's trust in an organisation has greater consequences than an equal loss in value resulting from chance. For example, an investor's loss of value of 10 percent in a pension fund due to adverse conditions in the market that the firm's experts have failed to address will make the investor upset and disappointed and may cause them to leave the firm if it is not too costly. On the other hand, experiencing the same loss in value as a result of the firm (worst still one of its representatives) deliberately abusing the investor's good faith will cause the investor to be disappointed as well as angry and highly likely to terminate the customer relations. And with this fail-out (loss in trust) transactions will be affected as investors in question will stop trading with the company (Bohnet et al., 2008).

Secondly, in countries that highly value betrayal, the above responses were observed to be particularly severe. The segment of these countries was those that had attributes of heavily relying on personal relations due to low legal protection in the country. Looked at differently, individuals that live in countries with strong and functional legal institutions are more likely to have hope that the institutions will come through and facilitate compensation once another party betrays them. The institutions are there to punish bad behaviour while rewarding good behaviour. Nevertheless, these options worsen the sensitivity to betrayal in nations with weaker

formal institutions, hence, it is not valuable in such nations. Therefore, an individual's (firm's) reputation is a more critical asset in states that cannot offer individuals effective legal protection. However, this asset is very fragile (Bohnet et al., 2008).

In summary, trust can be considered as the action of empowering a third-party individual with the management of endowments of an individual expressing trust. Both an individual's risk appetite and belief on the perceived trustworthiness of the individual given the resources to manage on their behalf influences the willingness to exhibit and act in a trusting way by the investor. A key difference is noted between preference for standard risk such as those due to natural randomness of events and risk preferences that are as a result of potential human being manipulation of events. In the act of trust, the latter is more significant than the former (Guiso, 2012).

II-1.3 Chapter Objectives and Contribution to Extant Literature

This section of the thesis considers the following objectives: i) Establish determinants of consumer (mis)trust in financial institutions (financial service providers) ii) Investigate whether the determinants of trust vary across different segments of financial institutions (informal, semi-formal and, formal institutions) and; iii) Conclusions, possible policy, and regulatory implications.

These study objectives and approaches are summarised in figure 1, in the next section.

Generally, there is limited literature when it comes to the phenomenon of consumer (mis)trust in financial services. And one specific area that has not been explored is that of determinants of individual (mis)trust in financial services. So far, literature (Dupas et al., 2012; Claessens 2006; Central Bank of Kenya and FSD Kenya, 2013) only offers descriptive statistics on the issue of mis(trust) in formal financial institutions/services in the Sub-Saharan African region. Therefore, our empirical analysis seeks to contribute to addressing this gap that exists in the literature by investigating the determinants of (mis)trust in financial services, and explore if they differ across the different types of financial service type (formal, semi-formal, and informal financial services).

In the Sub-Saharan African region, there has been a lack of data on consumer financial service trust, hence, there has been limited literature on this phenomenon. Therefore, with the availability of the Kenya FinAccess Survey 2015 which has questions on the trust component, we

seek to contribute to the investigation of this phenomenon. The dataset employed is unique as it disaggregates the (mis)trust component by type of financial service unlike the studies outside SSA region that have attempted to investigate this phenomenon. These theoretical and empirical studies have employed general level of trust in society (trust for one another in society)[7] as a trust index[8] (Guiso et al., 2004; Guiso et al., 2008). With the availability of data on an individual's 'reported trust' or 'lack of it' in specific financial institutions, our estimations employ a more precise measure of trust variable than the studies and models that have employed general trust in society.

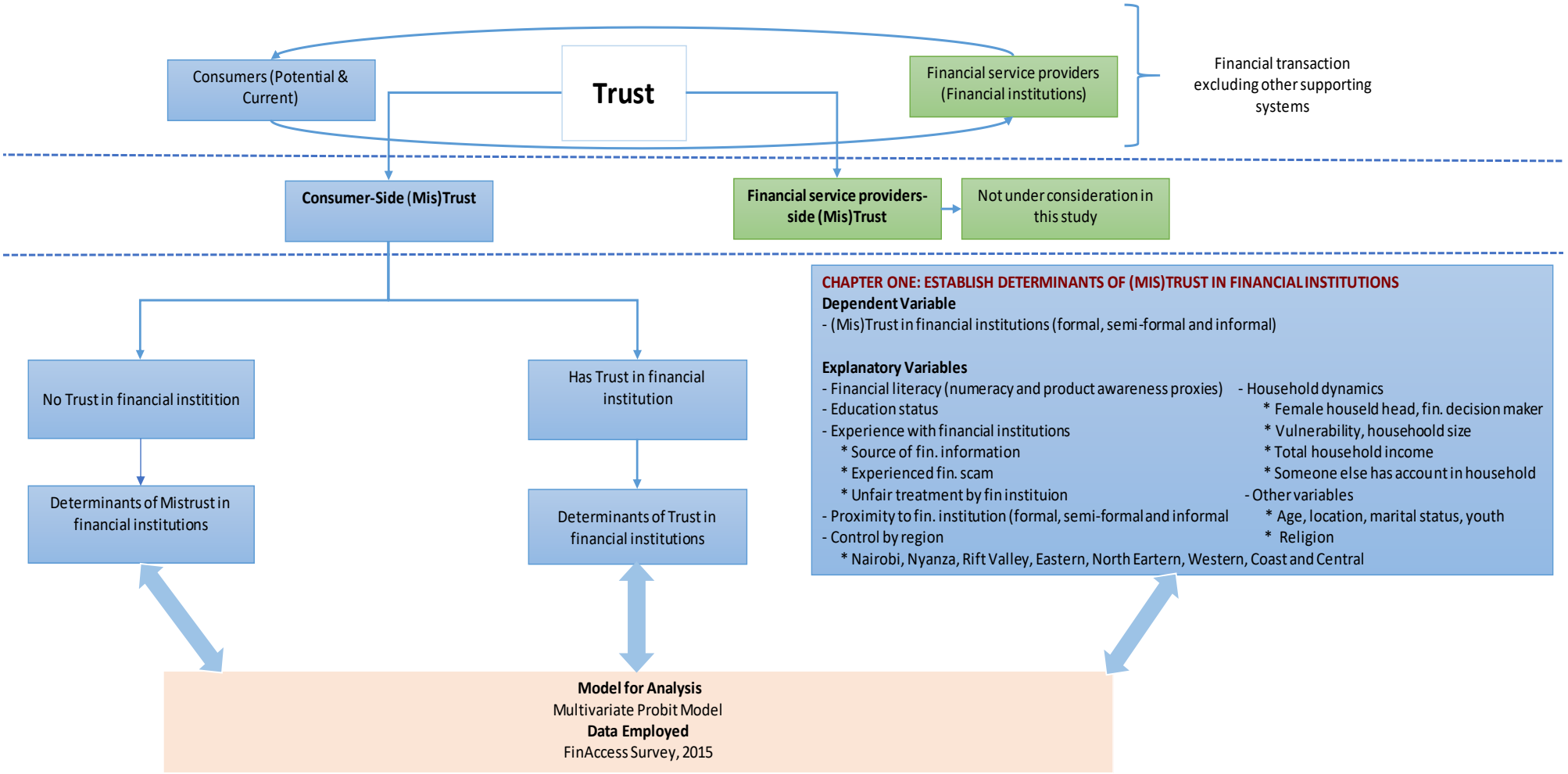
Further, the other strength of this chapter is its consideration of all the three types of financial services (formal, semi-formal, and informal) in the analysis. This is important because in Kenya, like in many other Sub-Saharan African countries, non-traditional[9] financial services are key to many individuals. Additionally, financial market innovations have also mainly been coming from this type of financial institutions that are outside the traditional (mainly formal e.g., banks). Therefore, as we explore the mis(trust) phenomenon in formal financial institutions, a similar analysis is conducted for semi-formal and informal financial institutions (services), hence, it will provide an understanding of these two types of financial institutions that have not fully been explored.

[7] For example, the general trust that people have in other people in society.
[8] Measure of trust.
[9] Services outside traditional ones, banks, insurance companies, etc.

Other contributions to the extant literature that will be discussed in chapter three also apply here, as the two chapters are closely related.

The research findings will help in developing initiatives aimed at reducing information asymmetry, improving trust in financial services, and ultimately reducing the proportion of consumers that self-exclude from the financial market. Additionally, the findings from this empirical analysis can help in improving the quality of financial services in the market through a deep understanding of the demand and what drives their (mis)trust.

Figure 1: Summary of Idea and Approach



Source: Own graphical depiction of study idea

II-3.0 LITERATURE REVIEW

As mentioned earlier, there is limited literature on the topic of determinants of consumer (mis)trust in financial services. In supporting our analysis, we consider the following literature that touches on determinants of (mis)trust in financial services.

Filipaik (2015) empirically investigates the role of consumer geographic proximity to a financial institution and its influence on their ability to trust the given financial institution with keeping their money safe. This literature uses evidence from India. Additionally, they considered the usage of a wide range of information sources that are likely to narrow physical distances between financial institutions and individuals, and sought to establish the extent to which geographic proximity is relevant in influencing trust in financial institutions amidst the use of information sources by households in India. They used savings patterns of Indians from a large-scale survey. One of the key findings was that distance to a financial institution was key in trusting the financial institution with savings. Consumers who could not commute to a financial institution within 'a one-day distance' were established to be less likely to trust the given financial institution with their savings. Nevertheless, the research established that geographic proximity to a financial institution was still important in influencing an individual's trust in each financial institution when controlling for the use of different information sources Filipaik (2015).

Filipiak (2015) attempts estimations on the role of proximity to a financial institution and its impact on consumer (mis)trust. This research does not explore household characteristics, dynamics[10] and other factors that can influence (mis)trust in financial institutions. Therefore, our empirical analysis contributes to the literature by considering more comprehensive factors that might determine trust in financial institutions.

Further, a theoretical model as proposed by Guiso et al. (2008) is insightful on the role of trust in financial exchanges. This model uses the case of the stock market. The model theoretically argues that the level of education and availability of information about the financial market may influence customer trust. In their model, the customer has two investment options: either invest their money in a safe asset that offers a lower return or takes the option of a higher return but on a risky asset (Guiso et al., 2008). In making up their mind, on whether to invest their money or not, consumers assess and put into consideration the possibility of a bad outcome such as the financial institution with whom they make the investment cheating, causing them to lose their money. This model considers the investor's level of trust in the planned investment as the complementary probability. They try to evaluate the unknown but "true" distribution of pay-offs in the future as a result of their investment in either safe or risky assets. In an event that the investor deems the perceived probability attached to a bad outcome to be very high, thereby leading to very low investor trust in risky

[10] Household financial decision-maker, sex of household head, belonging-minority or major tribe, per capita household income, etc. which are important in the Sub-Saharan African region.

investment, they will prefer investing in safe assets that offer a low return. Therefore, risky assets will be avoided despite the high return. Investors will only consider risky assets when their trust is high enough (Guiso et al., 2008).

Further Guiso et al. (2008) empirically establish that when it comes to holding risky assets, high education in addition to wealth and age of the respondent is important. It was argued that investors are better able to assess returns from an investment given better information and a sophisticated level of education, thus, influencing (increase or decrease) their trust in each investment opportunity. In this work, a general measure of trust prevailing in society (people) was used as the trust index or method of measure.

Therefore, with the above highlighted literature review, our empirical estimation in this thesis chapter has great potential of deepening and contributing new insights in this research area.

II-3.2 Summary Results Findings

Chapter three of our work aims at investigating determinants of consumer (mis)trust in financial services. Three types of financial institutions are considered: formal, semi-formal, and informal institutions. We employ a multivariate probit model in our empirical estimations. When it comes to individual trust in formal financial institutions, financial literacy, proximity to a financial institution, total household income, accessing financial information from formal channels, and education are established to have a positive impact. Further, female household heads and individuals in rural areas are established to be less likely to have trust in formal institutions. Additionally, single household heads are observed to be more likely to trust formal financial institutions relative to married household heads. In the informal financial institution category, it is established that high financial literacy (measured through financial numeracy and product awareness) and education levels, are significant and present a negative influence on the likelihood of an individual trusting informal financial institutions. On the other hand, proximity to informal financial institutions, belonging to a minority group, and being a female household head is significant with a positive impact on an individual's likelihood of having trust in informal financial institutions. When it comes to semi-formal services, education, and the type of financial institution an individual is close to having a positive and significant influence on their trust in this category of financial institution.

II-4. EMPIRICAL ANALYSIS

In this research, a multivariate probit model is employed in understanding the determinants of an individual's (mis)trust in different financial institutions.

II-4.1 Data

This empirical analysis uses data from the Kenya FinAccess Household 2015 Survey. This was the fourth access to finance survey conducted in Kenya. The data under consideration is cross-sectional in nature. The FinAccess, also called FinScope Surveys, aims at generating information to help in understanding demand-side dynamics in the financial sector, specifically looking at access to, and utilisation of financial services in the Kenyan market (Central Bank of Kenya and FSD Kenya, 2015).

The FinAccess Household Survey is a nationally representative survey with a sample size of 8,665 respondents (each representing one household). The survey only considers adult (age 18 and above) respondents. The survey is conducted by the Central Bank of Kenya and other major stakeholders in the financial sector. The survey pays great attention to the quality of the data collected. Over the years, methods and techniques have been refined for a better outcome of data collection (Central Bank of Kenya and FSD Kenya, 2013).

II-4.2 Model Specification

II-4.2.1 Multivariate Probit Model

In the Kenya FinAccess Household Survey, respondents answer a question on which type of financial institution they trust the most. The financial institution types have been grouped into 3 categories: formal, semi-formal, and informal financial institutions. The formal category includes commercial banks, insurance companies, and Microfinance institutions (MFIs). Savings and Credit Associations, banking, and mobile money agents compose the semi-formal category. On the other hand, the informal category has informal savings groups, shop lenders, Rotating Savings, and Credit Associations (ROSCAs)[11]. The fourth category is that of individuals who did not have trust in any financial institution.

The proposed methodology considers a wide range of independent variables in investigating the influential factors in an individual's reported perceived (mis)trust in certain types of financial institution(s).

The empirical specification of choice over the four categories (types of financial institution) can be modelled in two ways, either through using a multinomial or multivariate regression analysis. Under multinomial models, a key assumption is that of independence of irrelevant alternatives (IIA) which supposes that error terms of the choice equations under consideration are mutually exclusive. However, the choice of the financial institution most trusted might not actually be mutually exclusive

[11] ROSCAs operate like a merry-go-round concept where members of a self-select group contribute an amount at a given time (usually month end) and give a selected member.

as an individual may trust two or more types of financial institutions in the market. Therefore, the random error components of the reported types of financial institutions may be correlated. In this regard, a multivariate probit model was employed as it allows for the possible contemporaneous correlations when it comes to the choice of the type of trusted financial institution simultaneously. Many studies that have used multivariate probit models (Cappellari and Jenkins, 2003; Gillespie et al., 2004) argue that this framework facilitates improved efficiency in the estimation when considering simultaneity of selection.

In the FinAccess Survey, respondents were asked to indicate the financial institution/service they trusted the most making the answers mutually exclusive. Given this, the multivariate probit model follows the following empirical specification[12]:

$$\begin{aligned} Y_{i1} &= X'_{i\,1}\beta_1 + \varepsilon_{i1} \\ Y_{i2} &= X'_{i\,2}\beta_2 + \varepsilon_{i2} \\ Y_{i3} &= X'_{i\,3}\beta_3 + \varepsilon_{i3} \\ Y_{i4} &= X'_{i\,4}\beta_4 + \varepsilon_{i4} \end{aligned} \qquad (1)$$

where, i=individual, $Y_{i1} = 1$, if individual i trusts formal financial institutions (0 otherwise), $Y_{i2} = 1$, if individual trust semi-formal financial institutions (0 otherwise), $Y_{i3} = 1$, if individual trust informal financial institutions (0 otherwise), $Y_{i4} = 1$, if the individual does not trust any financial institutions (0 otherwise), X'_{ij} = matrix of factors affecting trust in

[12] Using the Stata user-written command, mvprobit, we estimate the multivariate probit model by simulated maximum likelihood. Cappellari and Jenkins (2003) offer more details on this process.

respective types of financial institution in the market, β_j= vector of unknown parameters and ε_{ij} = error term.

Borrowing from Cappellari and Jenkins (2003), our estimation assumes that the errors in the four models possess a mean of 0 and variance-covariance structure illustrated in matrix V below:

$$V = \begin{pmatrix} 1 & \rho_{12} & \rho_{13} & \rho_{14} \\ \rho_{12} & 1 & \rho_{32} & \rho_{42} \\ \rho_{13} & \rho_{32} & 1 & \rho_{23} \\ \rho_{14} & \rho_{42} & \rho_{43} & 1 \end{pmatrix} \qquad (2)$$

In this matrix, the ρ elements offers a coefficient correlation between two given errors. For example, ρ_{12} represents a correlation coefficient between ε_{i1} and ε_{i2}. In an event that we obtain values of $\rho_{12} > 0$, this will mean that the probability that a consumer will trust formal financial services and semi-formal services is increased by a set of common unobserved characteristics. On the other hand, when $\rho_{12} < 0$, will imply that the unobserved characteristics that increase an individual's trust in formal financial services will have an inverse effect on semi-formal financial services. In the last scenario, if $\rho_{12} = 0$, the two error terms, ε_{i1} and ε_{i2} are independent. Therefore, the unobserved characteristics that affect a consumer (mis)trust in formal financial services do not affect ones (mis)trust in semi-formal financial services (Cappellari and Jenkins, 2003).

II-4.3 Variables

This section details variables used in our empirical analysis and our research hypothesis for each one of them.

II-4.3.1 Dependent Variable

In the dependent variable, we consider the following set of variables:

Trust in financial institutions: To establish the determinants of consumer (mis)trust in financial institutions, this variable is employed as the dependent variable. Currently, no literature has explored this variable. In the survey, respondents were asked to indicate the financial institution (financial service provider) that they trust the most. We create a dummy variable out of this question; 1 is given for the most trusted financial institution and 0 otherwise. The following three categories are considered: formal, semi-formal, informal financial institutions. Where formal institutions include the following: commercial banks, insurance companies, and MFIs; semi-formal includes Savings and Credit Associations, banking and mobile money agents; informal includes informal savings groups, shop lenders, and Rotating Savings and Credit Associations (ROSCAs).It has to be noted that, in the three aforementioned types of trust, a '0' has two segments; one comprised of individuals who may just not have trust in that given financial institution but may have in another (for example, no trust in formal services but have trust in informal services), and those who do not have trust in any financial institution completely. The distinction is very important in our discussion of findings when it comes to perceived 'mistrust' in financial services.

No trust in any financial institution: The fourth dependent variable category is that of lack of trust in any financial institution. This variable is a dummy that includes those who completely have 'no trust' in any financial institution represented by '1', and those who have trust in one of the financial service type (formal, semi-formal and informal) represented by '0'. This dummy was generated from the question *"Which financial institution do you trust the most"* and considered a proportion of individuals who said they have no trust in any financial institution type (formal, semi-formal and informal).

II-4.3.2 Explanatory Variables

Financial literacy

Using this variable, the analysis considers the impact of financial literacy on (mis)trust in financial institutions. It is hypothesised that individuals with higher financial literacy are more likely to have trust in formal financial institutions. In measuring financial literacy, the literature has mainly employed a measure of an individual's financial numeracy skills. However, Carpena et al. (2011) argue that financial awareness, as well as attitudes towards financial products, should be considered to get a more robust measure of an individual's financial literacy levels. Therefore, this study uses two proxies of financial literacy: an individual's numeracy and financial product awareness. The two proxies are discussed in detail in the bullets below:

Financial numeracy: This is the index generated from the two numeracy questions[13] that were asked in the FinAccess Household Survey. An individual was given 0 (low) if they did not answer any question correctly, 1 (medium) if they answered one question correctly, and 2 (high) if they answered both questions correctly (Central Bank of Kenya and FSD Kenya, 2015). From the index above, three dummy variables will be generated: low financial numeracy, medium financial numeracy, and high financial numeracy is given index scores of 0, 1 and 2 respectively. In the analysis, the low financial numeracy category will be used as the base.

[13] The following questions were asked in establishing financial numeracy: 1) "You are in a group and win a promotion or competition for KSh100,000. With 5 of you in the group, how much does each of you get?" 2) "You take a loan of KSh10,000 with an interest rate of 10% a year. How much interest would you have to pay at the end of the year?" (Central Bank of Kenya and FSD Kenya, 2015).

Financial product awareness: This score like the numeracy index is derived from the FinAccess questions[14] on product awareness and split into three categories; low, medium and, high score respectively. Further, three dummy variables were generated: low financial product awareness, medium financial product awareness, and high financial product awareness. The low financial awareness category was considered as the base category (Central Bank of Kenya and FSD Kenya, 2015).

Educational Status: Another explanatory variable that is considered is an individual's level of highest formal education attained. We expect that an individual with a minimum qualification of secondary school is more likely to trust financial institutions. In the Survey, respondents were asked[15] of their highest level of formal education attained. Four dummy variables were generated in understanding this variable: "no education" for individuals without education, "primary education" for those with some primary education (without completion) and those who completed, "secondary education", and "tertiary education" for individuals with a diploma and above. The 'no education' dummy is used as the base category.

[14] The following questions were asked under product awareness: 1) "There are many words used in Kenya that apply to, or concern, financial services. Please tell me which of the following have you ever heard of? A list was provided/read to respondent 2) Have you ever heard of these financial providers/government schemes/? The list provided/read (Central Bank of Kenya and FSD Kenya, 2015).

[15] What is the highest level of formal education completed by the respondent?

Experience with financial services

In the following variables, we investigate if a consumer's experience with a financial institution, especially a bad experience has an impact on their (mis)trust in financial institutions. The section also considers the influence of source of financial information. This section considers three variable proxies, the source of financial information, experienced a financial scam and, experienced unfair financial treatment by their financial institution. The three variables are discussed in detail below:

Source of financial information: This variable is generated from the question "*who do you depend on most for financial advice?"* The variable is grouped into two; informal and formal sources and a dummy variable for formal sources was considered in the analysis. In the literature, this has not been modelled before. Formal sources of information include financial institutions, print media, television, and radio. On the other hand, informal sources include information from sources such as friends and family members. In our empirical estimation, it is hypothesised that people accessing financial information from informal sources are less likely to have trust in formal financial services such as formal banking institutions and vice versa.

Experienced financial scam: This variable is obtained from a question that sought to find out if an individual had experienced a financial scheme (*for example a Ponzi scheme*). The variable is obtained from the question

"*Have you ever lost money in a financial scheme?"* This financial scheme is considered for both informal and formal financial services. Our expectation is that this variable has a negative influence on an individual's trust in financial institutions.

Experienced unfair treatment by financial institution: This variable is obtained from the question "*Why did you close or stop using a bank account?"* All the individuals that gave a response that is deemed as being 'unfair treatment' by a financial institution such as lost money taken by the bank, institution collapsed, unfair charges, and dissatisfaction with services offered by the financial institution were grouped together and dummy generated. We hypothesise that individuals that experience unfair treatment by a financial institution are more likely to have a lack of trust in financial institutions. This variable only considered formal financial services (banking services). The informal services are not captured because the question was not asked for individuals accessing informal financial services.

Type of financial institution close to (formal or informal): In this variable, we seek to investigate the impact of the type of financial institution an individual is close to on their trust in financial institutions. As backed by other studies (Bönte, 2008; Bachman and Lane, 1996), we hypothesise in this section that individuals are likely to have more trust in the financial institution type they are close to. The study hypothesised that the type of financial institution an individual is close to has a negative influence on their trust for the other type of financial institution (e.g., individuals close to informal financial services are likely to have less trust

in formal financial institutions). Three dummy variables were generated: close to formal, close to semi-formal, and close to an informal financial institution.

Household dynamics

In this set of variables, we consider special household characteristics and how they influence (mis)trust in financial institutions.

Female household head: In investigating whether the gender of the household head has an influence on their (mis)trust in financial institutions, a dummy variable for a female household head is generated.

Household financial decision-maker: Using the survey question "*Who makes financial decisions in the household?"* a dummy variable is developed for household financial decision-makers. It is hypothesised that financial decision-makers are more likely to have trust in financial institutions.

Vulnerability: Vulnerability can affect the way an individual interacts with society. In this regard, this variable seeks to investigate if vulnerability has any influence on the (mis)trust in financial institutions. In the FinAccess

survey, the Progress out of Poverty Index (PPI)[16], a tool of the Grameen Foundation was used in developing poverty or vulnerability categories. The PPI uses household assets and living conditions to establish an individual's likelihood of being poor or not. The survey used the PPI index to rank individuals as "least poor", "poor" and "very poor" depending on the score. Using this ranking, our analysis generated a dummy variable most vulnerable using the very poor category. A negative relationship was hypothesised when considering formal institutions and positive for informal financial institutions (vulnerable individuals are less likely to trust formal financial institutions).

Household size: In establishing whether dependency levels have any impact on someone's (mis)trust in financial institutions, household size is used as a proxy for dependency.

Household income: To investigate whether household income is influential, we consider total household income. The income recorded in the survey was in Kenyan Shilling (*USD1=100KSh approximately*). The study transformed the income variable into a log form.

Another household member has an account: From the question "does any other household member have an account?" A dummy variable is generated for households with at least two members having access to

[16] https://www.povertyindex.org/country/kenya

formal financial services (account). This was only done for households with access to bank accounts. The informal services are not considered because it was not asked in the survey.

Kenyan regions: The analysis controlled for the location using the different regions in Kenya. Just like location, Kenyan regions have been established to have different financial inclusion dynamics (CBK and FSDK, 2013; 2015 and 2018). The following regions are considered in the analysis: Nairobi, Nyanza, Rift valley, Eastern, North Eastern, Western, Coast and Central regions of Kenya.

Other Variables

Age: The analysis controlled for age. On this variable, we expect the older consumer to be more inclined to trust semi-formal and informal financial services. This might be informed by commercial bank closures experienced in their lifetime and strong community networks that lead to the use of self-selected informal financial services. .

Minority group: In the FinScope, there is a question on language a respondent is comfortable answering the questions in. A respondent who mentions English or Swahili (majority languages) will be treated in the majority while the rest will be treated as a minority and hence this study will test if being from the minority background has an influence on (mis)trust for financial services.

Rural dweller: To investigate if an individual's location influences their (mis)trust in the financial institution, a dummy for rural dweller (using rural area) was generated. In the survey, respondents were asked about the

classification of their location (whether rural or urban). Here, we hypothesise that rural dwellers are more likely to trust semi-formal and or informal financial services relative to formal financial services become of their income levels and ease accessibility to informal services.

Single household head: In investigating the impact of an individual's marital status, a dummy variable for single individuals is generated using the question "*what is your marital status".* By including this variable, we seek to test if having a partner influences trust in financial institutions. The assumption is that married individuals are more likely to feel comfortable about service use as they can share with their partner financial information, challenges, and solutions. Therefore, we expect being single to have a negative impact on trust in financial institutions.

Youth: A youth was defined as a person (respondent) under the age of 30. Therefore, a dummy variable using all individuals under the age of 30 is generated. The study tests the idea of whether being a youth influences someone's (mis)trust in financial institutions or not. We expect that the youth are more likely to have trust in semi-formal (mobile-platform oriented financial services) financial services because they are more likely to be savvy in mobile technology relative to older consumers.

II-4.4 Summary Statistics

In this section, we present the summary statistics for the dependent and explanatory variables considered in our empirical analysis.

Table 2: Summary statistics

Variable	Mean	Std. Dev.	Variable	Mean	Std. Dev.	Variable	Mean	Std. Dev.
Trust in financial institutions			**Household dynamics**			**Other Variables**		
Formal institution	0.396	0.489	Female household head	0.268	0.443	Age	37.197	16.571
Semi-formal institution	0.337	0.473	Household financial decision-maker	0.506	0.500	Minority group	0.228	0.420
Informal institution	0.063	0.244	Vulnerability index-most vulnerable	0.421	0.494	Location - rural	0.560	0.496
No trust in any institution	0.205	0.403	Household size	4.392	2.486	Single household head	0.393	0.489
Financial Literacy Proxies			Total household income	161.348	1819.246	Youth	0.395	0.489
Financial numeracy - high	0.270	0.444	Another household member has account	0.148	0.356			
Financial numeracy - medium	0.336	0.473	**Educational status**					
Financial numeracy - low	0.394	0.489	No education	0.180	0.384			
Financial product awareness - high	0.285	0.452	Primary education	0.446	0.497			
Financial product awareness - medium	0.349	0.477	Secondary education	0.279	0.448			
Financial product awareness - low	0.366	0.482	Tertiary education	0.095	0.293			
Experience with financial services			**Type of financial institution close to**					
Source of financial information - formal	0.100	0.301	Formal institution	0.060	0.237			
Experienced financial scam	0.049	0.215	Semi-formal institution	0.778	0.415			
Experienced unfair financial treatment	0.062	0.240	Informal institution	0.066	0.249			
Number of observation (N)	**8488**							

In Table 2 above, we observe that 39.6 percent of respondents indicated formal financial institutions as their most trusted. This was the highest trust amongst the three categories under consideration. Trust in semi-formal financial services scored 33.7 percent while trust in informal was the lowest at 6.3 percent. Further, the category of those who indicated not to trust any of the above financial institutions was significant, it stood at 20 percent. With these low numbers in the trust of financial institutions, our study is key in understanding what drives the observed numbers in this survey.

As can be observed, when it comes to the model's dependent variables, one of the categories, informal financial services accounts only for a small proportion of 6.3 percent of the data observations. In this regard, our analysis had an option of merging this category with the closest to it in terms of characteristics, semi-formal category. Nevertheless, we decided to consider it separately in our multivariate probit model because it is a growing category type of financial services in Kenya and the Sub-Saharan African region at large. Therefore, its investigation in our current topic is relevant to supporting policy and its growth. Further, considering all the three types of financial services in the market is one of the contributions of this paper to the current gap that exists in the literature.

II-4.5 Test for Multicollinearity

In this section, we consider assessing an issue of multicollinearity among variables in the model in question. Multicollinearity is an issue of concern because it influences the estimated standard errors in the model which in turn affects which of our model explanatory variables are significant. In addressing this issue, we firstly conduct correlation tables among all the model variables to establish any signs of multicollinearity. In the second step, we conduct regressions of explanatory variables and thereafter calculated the variance inflation factor (VIF) and the tolerance values. In the VIF, the increase in the variance of estimated coefficients is measured and compared to a situation where correlation is absent among model explanatory variables. There is a general rule of thumb that a VIF score of 5 or higher (or tolerance scores of 5 or less) raise concerns in terms of multicollinearity among explanatory variables (Allison, 2012; Menard, 2002; Menard, 2010).

In our model estimation, we establish VIF values below 4, hence, the model can be considered acceptable (we are confident our results are not biased by collinearity).

II-5. Discussion of Results

II-5.2 Determinates of Trust in Formal Financial Institutions

In this section of the paper, an analysis of determinants of trust in formal financial institutions is conducted. The results are obtained from a multivariate probit estimation.

Table 4: Determinants of trust in formal financial institutions

Explanatory Variable	Marginal Effect	Std. Error	Explanatory Variable	Marginal Effect	Std. Error
Financial literacy (base=low numeracy and awareness)			**Household dynamics**		
Financial numeracy - high	0.171***	0.043	Female household head	-0.103***	0.0395
Financial numeracy - medium	0.117***	0.037	Household financial decision-maker	-0.027	0.0341
Financial product awareness - high	0.322***	0.048	Vulnerability index-most vulnerable	-0.049	0.0326
Financial product awareness - medium	0.322***	0.040	Household size	0.018***	0.0068
Educational status (base=no education)			Total household income	0.049***	0.0134
Primary education	0.272***	0.055	Another household member has acco	0.032	0.0435
Secondary education	0.438***	0.065	**Other Variables**		
Tertiary education	0.527***	0.083	Age	0.001	0.0014
Experience with financial services			Minority group	0.016	0.0472
Source of financial information -formal	0.150***	0.051	Location - rural	-0.119***	0.0331
Experienced financial scam	0.085	0.068	Single Head	0.111***	0.0374
Experienced unfair financial treatment	-0.092	0.061	Youth	0.039	0.0452
Type of financial institution close to			Constant	-1.545***	0.173
Formal institution	0.663***	0.086			
Semi-formal institution	0.224***	0.064			
Informal institution	0.210**	0.084			
Log-Likelihood	-12364.76				
Wald test χ^2 (132)	2972.83				
No. of Observations	8488				

***Significance to 1%; **Significance to 5%; *Significance to 10%

In our estimation, it is established that an individual's financial product awareness and numeracy levels are very significant in influencing their trust in formal financial institutions. Individuals with a high and medium score in financial product awareness and numeracy are established to be more likely to have trust in formal financial institutions relative to individuals with low financial numeracy, and product awareness. The two factors, numeracy and financial product awareness are used as proxies in estimating an individual's level of financial literacy. Therefore, financial education initiatives should be encouraged in financial inclusion initiatives to facilitate improved trust in formal financial institutions, which is likely to contribute to reduced self-exclusion in the formal financial sector.

Further, an individual's education is significant in explaining their trust in formal financial services. Respondents with education are established to be more likely to trust formal financial institutions than those without an education. The likelihood increased from primary to tertiary education. This can be attributed to basic financial literacy content in the education system that increases in complexity with the level of education. This has also been established to be linked to formal employment, a category in which people with tertiary education are likely to be compared to their counterparts without or with lower education. In the same vain, individuals with a higher income are also more likely to trust formal financial services. This is very much in line with the current literature on the impact of education (Campbell, 2006; Hakhverdian & Mayne, 2012).

Considering the source of financial information, a dummy for formal source is established to be significant with a positive influence on the trust

in informal financial services. This result makes sense as it can be assumed that accessing financial information directly from the source (in this case formal institution) may reduce information asymmetry between the consumers and financial institutions. Additionally, we establish that unfair treatment by a financial institution such as unexplained deductions or loss of money in the account is negatively related but is not significant. It is also established that rural dwellers are less likely to trust formal financial institutions.

When it comes to household dynamics, female household heads are observed to be less likely to trust formal financial institutions compared to their male counterparts. This may be explained by the high marginalisation and societal exclusion. With this, women end up not trusting institutions and community structures in the country as they are deemed to work against them (Biegon, 2016). In terms of marital status, single household heads are established to be more likely to trust formal financial institutions relative to their married counterparts. Additionally, household size was also observed to be significant with a positive influence on trust.

Further, it is established that proximity to any financial institution type has a positive impact on the likelihood of trusting a formal financial institution. Filipiak (2015) in an investigation of proximity and its impact on trust in financial institutions reached the same conclusion in a case study of Indian consumers.

II-5.3 Determinants of Lack of Trust in Financial Institutions

In this section, we investigate the factors that determine the lack of trust in financial institutions. This section looks at the proportion of individuals that have 'no trust in any financial institution' in the market.

Table 5: Determinants of lack of trust in financial institutions

Explanatory Variable	Marginal Effect	Std. Error	Explanatory Variable	Marginal Effect	Std. Error
Financial literacy (base=low numeracy and awareness)			**Household dynamics**		
Financial numeracy - high	-0.150***	0.053	Female household head	0.0583	0.0453
Financial numeracy - medium	-0.207***	0.042	Household financial decision-maker	-0.0414	0.0399
Financial product awareness - high	-0.520***	0.057	Vulnerability index-most vulnerable	0.081**	0.0367
Financial product awareness - medium	-0.458***	0.044	Household size	-0.015*	0.0076
Educational status (base=no education)			Total household income	-0.079***	0.0153
Primary education	-0.549***	0.051	Another household member has acco	-0.176***	0.0541
Secondary education	-0.716***	0.068	**Other Variables**		
Tertiary education	-0.781***	0.106	Age	0.008***	0.002
Experience with financial services			Minority group	-0.167***	0.053
Source of financial information -formal	-0.246***	0.070	Rural dweller	0.081**	0.039
Experienced financial scam	-0.203**	0.088	Single Head	0.018	0.043
Experienced unfair financial treatment	-0.0085	0.085	Youth	0.002	0.052
Type of financial institution close to			Constant	0.789***	0.183
Formal institution	-0.672***	0.092			
Semi-formal institution	-0.639***	0.058			
Informal institution	-0.928***	0.091			
Log-Likelihood	-12364.76				
Wald test χ^2(132)	2972.83				
No. of Observations	8488				

***Significance to 1%; **Significance to 5%; *Significance to 10%

In the FinAccess Survey, some respondents indicated that they have no trust in any financial institution in the country. Understanding this category is important in order to establish if the results are consistent with those from individuals who reported trust in a certain financial institution like in the previous section on formal institutions. The expectation was that the results here will be the opposite but consistent with what is obtained in the other categories.

Our findings in this section suggest that financial literacy (as measured through financial product awareness and numeracy) is significant in influencing an individual's lack of trust in any financial institution. It is observed that individuals with high and medium financial numeracy are less likely to have no trust in any financial institution in the market. In the same vain, individuals with high and medium financial product awareness are less likely to have no trust in any financial institution in the market. The two variables are used as proxies for financial literacy; therefore, we can conclude that high and medium levels of financial literacy have a negative influence on an individual having no trust in any financial institution.

In terms of education, it is established that individuals with some level of formal education are less likely to have no trust in any type of financial institution compared to their counterparts without one. This is very consistent with the findings in the above sections (trust determinants in formal financial services), where it was established that education (primary to tertiary) has a positive influence on trust in all types of financial institutions with tertiary education having the greatest impact.

Further, individuals with any access to financial information, both informal and formal are less likely to have no trust in any financial institution. This result indicates the importance of having some form of access to financial information and the role it plays in influencing an individual's trust in financial institution(s).

In terms of proximity to financial institutions, all individuals with proximity to the three types of financial institutions (formal, semi-formal, and informal) are less likely to have no trust in any financial institution. This result again gives an indication of the importance of experience and exposure to financial institutions.

Additionally, household size is also estimated to be significant in influencing trust in no financial institution. An increase in household size is found to be negatively influential in having no trust in any financial institution in the market.

When it comes to vulnerable groups, the dummy variable for the most vulnerable category was significant and with a positive sign. Meaning, the most vulnerable individuals in Kenyan society are more likely to have 'no trust in any financial institution' in the market. This result is in line with the general literature on the vulnerable and how they perceive and interact with institutions, from public to private institutions.

Lastly, location has a significant role to play in determining an individual's lack of trust in any financial institution. The dummy variable for rural area location is significant and with a positive sign. Meaning, individuals in rural areas are more likely to have no trust in any financial institution compared

to their counterparts in urban areas. In the same vain, the variable for individuals who identified as being from a minority group is observed to be significant and with a positive influence on lack of trust in any financial institution. This is consistent with the literature in different fields which have established that communities in these regions do not trust systems such as the government and big businesses (Wilkes and Wu, 2018).

II-5.4 Determinants of Trust in Informal Financial Institution

In this section, we investigate the factors that influence trust in informal financial services in the market.

Table 6: Determinants of trust in informal financial institutions

Explanatory Variable	Marginal Effect	Std. Error	Explanatory Variable	Marginal Effect	Std. Error
Financial literacy (base=low numeracy and awareness)			**Household dynamics**		
Financial numeracy - high	-0.179**	0.072	Female household head	0.143**	0.062
Financial numeracy - medium	-0.055	0.055	Household financial decision-maker	0.012	0.053
Financial product awareness - high	-0.209***	0.077	Vulnerability index-most vulnerable	-0.021	0.050
Financial product awareness - medium	-0.089	0.058	Household size	0.012	0.010
Educational status (base=no education)			Total household income	-0.012	0.021
Primary education	-0.052	0.071	Another household member has acco	0.121*	0.067
Secondary education	-0.376***	0.095	**Other Variables**		
Tertiary education	-0.597***	0.159	Age	-0.002	0.002
Experience with financial services			Minority group	0.222***	0.065
Source of financial information -formal	-0.066	0.091	Rural dweller	0.062	0.052
Experienced financial scam	0.095	0.102	Single Head	-0.124**	0.060
Experienced unfair financial treatment	0.126	0.102	Youth	-0.110	0.070
Type of financial institution close to			Constant	-1.370***	0.260
Formal institution	-0.028	0.152			
Semi-formal institution	0.264***	0.092			
Informal institution	0.460***	0.117			
Log-Likelihood	-12364.76				
Wald test χ^2 (132)	2972.83				
No. of Observations	8488				

***Significance to 1%; **Significance to 5%; *Significance to 10%

In this section, we establish that individuals with high financial numeracy and product awareness levels are less likely to trust informal financial services. Therefore, enhancement of an individual's financial literacy levels has a negative impact on their trust for informal financial services. Further, the education of an individual is established to be significant and with a negative influence in determining their trust in informal financial services relative to their counterparts without an education. The negative influence (marginal effect) increases from secondary to tertiary education. Therefore, education has an opposite effect on formal and informal financial services. It has a positive influence on trust in formal financial services and a negative on informal services.

Further, it is established that minority groups are more likely to trust informal financial services in the market. This may be explained by the easy access that these groups have to informal financial services in the market. Additionally, features such as self-selection (individuals' select people they know and trust when setting the financial group for instance) and uncomplicated (few requirements relative to formal) procedures when accessing facilities such as loans make them attractive to the minority. Further, the type of financial institution close to is established to be significant. It is observed that individuals who are close to informal financial services are more likely to trust informal financial services.

When it comes to household dynamics, the dummy variable for female household heads is established to be significant. Female household heads are established to be more likely to trust informal financial services compared to their male counterparts. This result is opposite to the

negative influence that was observed in the trust in formal financial institutions. This result is very much in line with the literature that has established that, in the Sub-Saharan African region, women use informal financial services such as savings groups more than their male counterparts (FSD Kenya, 2015; FSD Zambia, 2018). This was further discussed in chapter one of our thesis. We highlighted that female household heads use informal financial services more than their male counterparts.

In terms of the dummy variable for individuals from a minority group[17], it is observed to be significant and with a positive influence on trust in informal financial services. On the other hand, the dummy variable for single household heads is established to be significant and with a negative influence in trusting informal financial services.

Lastly, the dummy variable for households with at least two members with access to financial services is also established to be significant with a positive influence. However, we did not investigate whether the members have the same type of financial services or otherwise. This could be interesting to explore as it might be that having the same type of financial services leads to sharing information thereby reducing information asymmetry but also boosting confidence as individuals feel they have a partner in their access and use of financial services. We did not attempt this thought due to data unavailability.

[17] Individuals who speak a language outside English and Swahili.

II-5.5 Determinants of Trust in Semi-formal Financial Institution

In this section, the research investigates the factors that influence trust in semi-formal financial services.

Table 7: Determinants of trust in semi-formal financial institutions

Explanatory Variable	Marginal Effect	Std. Error	Explanatory Variable	Marginal Effect	Std. Error
Financial literacy (base=low numeracy and awareness)			**Household dynamics**		
Financial numeracy - high	-0.040	0.042	Female household head	0.024	0.038
Financial numeracy - medium	0.002	0.036	Household financial decision-maker	0.047	0.033
Financial product awareness - high	0.027	0.047	Vulnerability index-most vulnerable	0.006	0.032
Financial product awareness - medium	-0.034	0.038	Household size	-0.009	0.007
Educational status (base=no education)			Total household income	0.011	0.013
Primary education	0.419***	0.051	Another household member has acco	0.032	0.043
Secondary education	0.376***	0.062	**Other Variables**		
Tertiary education	0.251***	0.080	Age	-0.008***	0.001
Experience with financial services			Minority group	-0.054	0.046
Source of financial information -formal	0.006	0.050	Rural dweller	0.041	0.033
Experienced financial scam	0.029	0.068	Single Head	-0.074**	0.036
Experienced unfair financial treatment	0.060	0.061	Youth	-0.074*	0.044
Type of financial institution close to			Constant	-0.682***	0.166
Formal institution	-0.0005	0.086			
Semi-formal institution	0.374***	0.061			
Informal institution	0.376***	0.082			
Log-Likelihood	-12364.76				
Wald test χ^2(132)	2972.83				
No. of Observations	8488				

***Significance to 1%; **Significance to 5%; *Significance to 10%

In understanding the determinants of trust in semi-formal financial services, the educational status of the respondent and their proximity to a given financial institution are established to be significant. It is established that education has an influence on an individual's trust in semi-formal financial services compared to the 'no-education' base category. As observed in the formal institution's section, education also has a positive influence here. Further, being close to semi-formal and informal financial institutions was established to have a positive impact on their trust in semi-formal institutions. Proximity to formal financial institutions is established to have a negative influence but was not significant in the analysis.

Further, the youth dummy variable is significant with a negative influence on trust in semi-formal financial institutions. This finding is surprising as the youth are expected to be technology savvy and expected to have trust in this innovation-driven category of financial services which includes services such as M-PESA, Kenya mobile platform-based financial services. Lastly, a dummy variable for the single household head was established to be significant and with a negative influence on trust in semi-formal financial services.

II-6. CONCLUSIONS, RECOMMENDATIONS AND POLICY OPPORTUNITIES

Using a multivariate probit model, this chapter investigated the determinants of consumer (mis)trust in financial services. This empirical analysis looked at three types of financial institutions: formal, semi-formal, and informal financial institutions. Considering evidence from the Kenyan financial sector, we employed the FinAccess National Household Survey.

In terms of an individual's trust in formal financial institutions, financial literacy and education are established to have a positive impact. Individuals with an education are established to be more likely to have trust in formal financial institutions compared to their counterparts without education. The likelihood (marginal effect) increased with the level of education[18] attained as well as financial literacy levels (medium to high). Further, being close to any type of financial institution (formal, semi-formal, and informal) is established to also have a positive impact. However, the value (marginal effect) for individuals close to a formal financial institution is observed to be bigger than those close to semi-formal and informal institutions. Additionally, individuals who depend or access information via formal sources such as financial institutions, TV, and radio are established to be more likely to have trust in formal financial institutions compared to those who depend on informal sources such as friends, family members, local shops, etc.

[18] From primary to tertiary.

When it comes to household dynamics and trust in formal financial institutions, female household heads are established to be less likely to have trust in formal institutions relative to their male counterparts. Further, single household heads are also observed to be more likely to trust formal financial institutions than their married counterparts. Further, we observe that being a rural dweller is significant in influencing trust in formal financial institutions with individuals in rural areas less likely to trust such institutions. On the other hand, total household income is a significant variable with a positive effect on an individual's likelihood of trusting formal financial institutions in the market. Other variables such as bad experience in the interaction with financial institutions, for example, experiencing financial scams and unexplained loss of money in the account, are established to have a negative influence but are not significant in our research estimations.

Investigating individuals with 'no trust in any financial institution', our empirical analysis established that factors such as high financial literacy, higher education levels, being a youth, identifying as a minority, small household size, high income, proximity to any type of financial institution and receiving information from formal sources are all significant with a negative influence on the likelihood of an individual having 'no trust in any financial institution' in the country. On the other hand, individuals that identified as most vulnerable[19] and those from rural areas are found to be

[19] Using the Progress-out of Poverty Index scales and identified by the Gramean Foundation.

significant and with a positive influence on the likelihood of not trusting any financial institutions in the economy.

In the informal financial institution category, the research established that high financial literacy (measured through financial numeracy and product awareness) and education levels, are significant and presented a negative influence on the likelihood of an individual trusting informal financial institutions. On the other hand, proximity to informal financial institutions, belonging to a minority group, and being a female household head is significant with a positive impact on an individual's likelihood of having trust in informal financial institutions.

Considering the semi-formal category, an individual's educational status and source of financial information are established to be significant and with a positive impact on trust in semi-formal services. Individuals with an education are more likely to trust this category compared to their counterparts without any formal education. Similarly, individuals who access financial information from formal sources such as television, radio, and financial institutions are more likely to trust semi-formal institutions. On the other hand, identifying as a youth and a single household head is significant with a negative influence on trust in semi-formal financial institutions.

In terms of cross-comparisons of determinants amongst the four categories, we establish that determinants in trust in formal financial institutions and 'no trust at all' in any financial institutions are opposite of each other. This result makes sense and provides evidence for the

consistency of the results obtained in our estimations. Additionally, determinants in formal and informal financial institutions are also opposite of each other, reflecting the difference in the types of services as well as the profile of individuals that are attracted to respective category.

When it comes to policy and projects aimed at addressing some of the issues established in this paper, the government and the rest of the stakeholders should continue to work with marginalised[20] communities in sensitising them about the operations of the financial institution and building their financial literacy through financial education projects. Equally, general socio-economic empowerment programmes and initiatives are necessary if these segments of the population are to have confidence in national institutions at large.

Further, financial sector regulators should continue supporting service providers' outreach through financial product innovations that reach the consumers at a cost-effective price. This is significant because proximity to financial institutions was established to have a positive impact on the likelihood of an individual having trust in financial institutions (the financial institutions they are close to). This is very consistent with financial inclusion literature (Filipiak, 2015) which has established that proximity to financial service points has a positive impact on access to and utilisation of financial services.

With education having a positive impact on improving the financial literacy of consumers, the stakeholders can decide to invest in specific

[20] Marginalised groups include the youth, women, and rural communities.

financial literacy campaigns or integrate the financial literacy curriculum in the educational content of the country.

With Kenya being the leader in financial inclusion (financial sector development) in the Sub-Saharan region, most of these findings are applicable to other countries.

CHAPTER III

THE ROLE OF CONSUMER (MIS)TRUST IN FORMAL AND INFORMAL FINANCIAL SERVICE UTILISATION: THE CASE OF KENYA

III - Chapter III Abstract

In this chapter of the thesis, we empirically as2qwsess the role of an individual's (mis)trust in financial institutions in their financial service utilisation. We employ bivariate probit models to allow for correlation in the unobserved factors in our dependent variables. We consider four scenarios: i) both formal and informal financial services are used; ii) only formal services are used; iii) only informal services are used; and finally, iv), both formal and informal services are not being used. The results that a consumer's (mis)trust in financial institutions plays a key role in both formal and informal service utilisation. In the four scenarios considered in our bivariate analysis, trust in all three types of financial institutions (formal, semi-formal, and informal) are established to be positive and significant and with a positive effect when consumers use both formal and informal services. In the extreme scenario, where neither formal nor informal services are used, trust in any financial institution (formal/informal) exerts a negative significant effect. Results show that exclusion from the financial system is less likely to occur for those individuals with trust in any type of financial institution.

III - BACKGROUND, MOTIVATION AND OBJECTIVES

III-1.1 Introduction

At the country level, contemporary discussions argue that the nexus between financial development and economic growth is anchored on the endogenous growth theory. In these discussions (Ikhide, 2015; Calderón and Liu, 2003; King and Levine, 1993; Demirgüç-Kunt and Maksimovic, 1998; Levine et al., 2000; Levine and Zevros, 1998), financial development is argued to take place as a result of financial intermediation, and to some extent through the influence of financial innovation and appropriate government policies in the sector. The highlighted literature argues that the efficiency with which savings are allocated to investment initiatives is the main driver for the contribution of financial development to economic growth. Therefore, financial intermediation can contribute to economic growth if it improves the allocation of capital in the economy.

Levine (2005) postulates that the critical role of a financial intermediary is in terms of allocating funds to those projects where the marginal product of capital is the highest. Therefore, an improvement in capital allocation in the economy is likely to lead to increased economic growth through increased overall productivity of capital. Empirical evidence in the Sub-Saharan African region suggests that the main channels through which financial intermediation is expected to influence growth include: producing information (Grossman and Hart 1980; Shleifer and Vishny 1997); allocating capital to productive uses (Acemoglu and Zilibotti 1997; Ndebbio, 2004; Rajan and Zingales 1998); monitoring investments and exerting corporate control (Levine 1997); facilitating trading,

diversification, and management of risks; mobilising and pooling savings; and easing the exchange of goods and services (Greenwood and Smith 1996).

As highlighted in the foregoing thesis sections, consumer use of appropriate financial services such as savings, insurance services, money transfer platforms with low risk and, credit facilitates improvements in livings standards in the general populace. The major assumption behind this argument is that there is inclusive use of services and enabling environment that protects consumers and facilitates appropriate use of such impactful services in the economy. However, this is not the case in many financial systems in the Sub-Saharan African region as there are barriers to the use of financial services.

With the potential positive impact that comes with financial inclusion, many African countries and international development organisations have over the years embarked on initiatives aimed at promoting this phenomenon to enhance economic growth and ultimately alleviate poverty in the region.

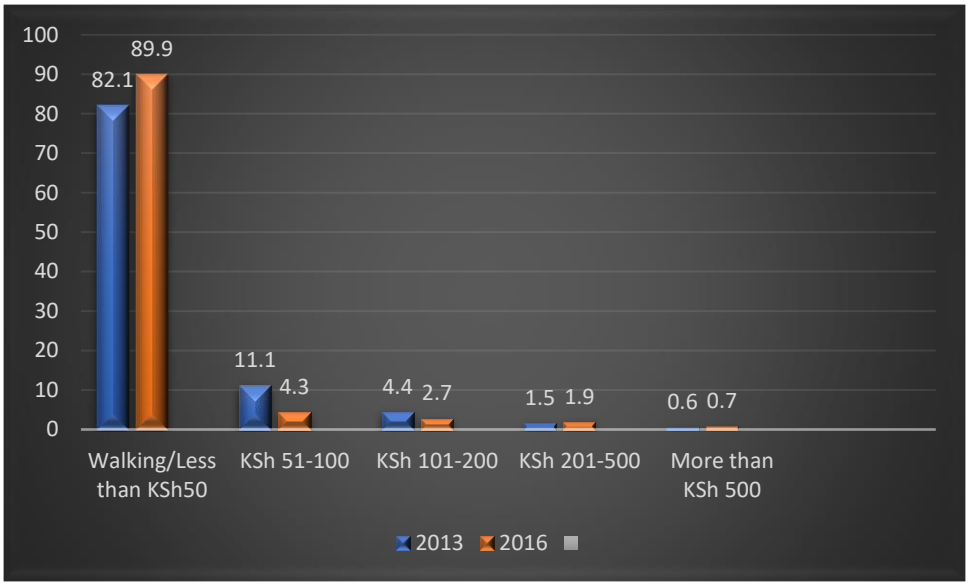
In the Kenyan case, the financial sector has scored some key successes in terms of expansion in access to financial services in the past fourteen years. Considering an example of the formal sector, the market has broadened access to formal banking services across incomes, gender, and age. This success has partly been attributed to the rapid and ongoing expansion of formal financial services, especially on the supply-side of the financial system. For example, the financial sector has since 2006

experienced key changes in the structure of its banking system such as authorisation of agency banking[21] that have been cited to have led to important progress on the accessibility of banking services (FSD Kenya, 2015). King (2012) established a 46 percent increase in bank branches, from 581 to 849 between the years 2006 and 2009.

[21] The Kenyan Central Bank in May of 2010 issued permission and supporting regulation for agency banking in the financial sector to complement the efforts achieved in physical access to branches.

Further, a margin of over 1,314 in the number of branch increases was recorded by 2013, translating to a 126 percent increase compared to the year 2006[22]. Central Bank of Kenya and Financial Sector Deepening Kenya (2015) argue that the increase in bank branches has led to reduced opportunity costs for accessing and maintaining financial services. The opportunity cost was calculated using the distance from home to the nearest branch as highlighted in figure 1.

Figure 1: Opportunity Cost of Accessing Financial Services



Source: FinAccess, 2013 and 2015

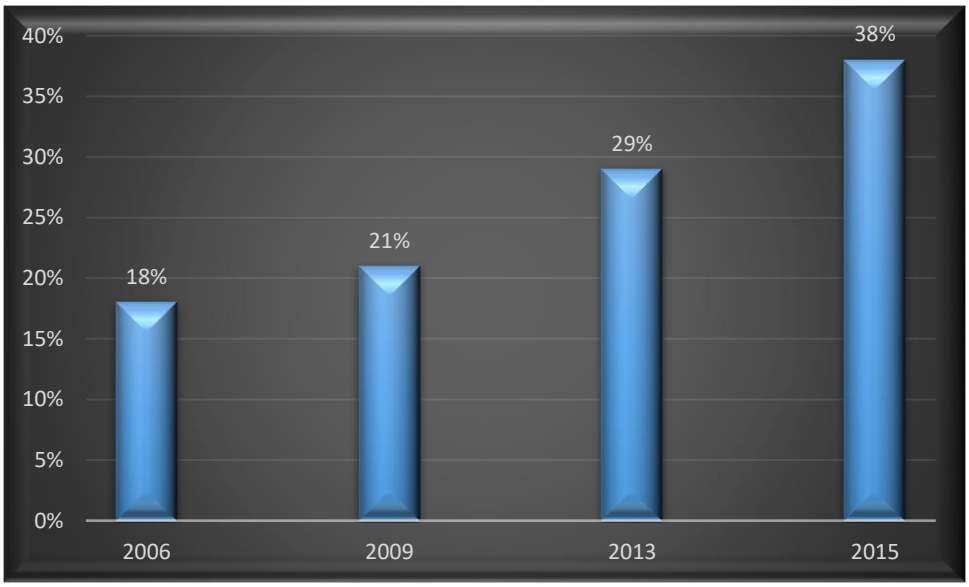
Figure 1 highlights the cost of public transport to reach the nearest financial service provider (2013 vs 2016). We observe in 2016, the financial cost of access is slightly cheaper relative to 2013. Almost 90% of the population are able to access financial facilities at a cost of less than 50 Kenyan Shilling (KSh).

[22] Source: FSP Kenya 2014 (http://fspmaps.org/).

Apart from increased access to financial services highlighted above, the cost of opening and maintaining a bank account has decreased in the Kenyan financial sector. This has been attributed to the advancement in financial technology and increased number of suppliers which has led to high competition due to a variety of financial services. Additionally, with the influence of Equity Bank, banks in Kenya promoted no-frills transaction accounts targeting non-traditional customers, usually the marginalised – low income, women, youth, etc. (CBK and FSDK, 2015).

Figure 2 below shows the gains in the use of formal bank services from 2006 to 2015 in the Kenyan financial system.

Figure 2: Use of Formal Bank Access, 2006 – 2015



Source: FinAccess survey (2006, 2009, 2013, and 2015)

Despite the many initiatives that have led to a significant expansion in financial sector infrastructure, increased branch network, and reduced opportunity cost of accessing formal banking services in Kenya, some argue that the achievement in the proportion of individuals using financial services especially formal services has not increased substantially over the

years. Figure 2 reveals that the majority of the adult population remains excluded from formal banking services, for example, in 2015, 62 percent of adults had no transaction or credit product or savings account from the formal[23] providers (CBK and FSDK (2015).

Existent literature investigates the drivers of financial inclusion especially in formal services such as transactions, savings, and credit. Carpena et al. (2011) explore the role of financial literacy; Bönte, 2008; Bachman and Lane, 1996 on proximity to financial institutions; CBK and FSDK (2013) on household income and gender of head of household. Further, Demirgüç-Kunt and Klapper (2012) established that cultural-norms are influential in demand for formal banking services in the economy. It has also been established that individuals who identify as minority[24] are more likely to have a different understanding of these services, hence, leading them to self-select out of the formal financial system. Additionally, consumers' state of employment might have an impact on their demand for formal banking services, with those in formal employment having a higher likelihood of demanding formal banking services. This is so because they need formal registration with government and statutory institutions such as revenue authority and are likely to be required to have one by an

[23] Financial institutions that are prudentially regulated by independent statutory bodies like the Central of Kenya.

[24] Minority variable generated using the main language spoken. A respondent who mentions English or Swahili (majority languages) is treated in the majority and otherwise in the minority (FinScope 2020).

employer for salary payment purposes (Demirgüç-Kunt and Klapper, 2012; Claessens, 2006; Rojas-Suarez and Gonzales, 2010; Beck and Brown, 2011).

Therefore, unless the financial system addresses consumer barriers to using formal bank services and tailors them to consumer needs, the financial inclusion gap in terms of formal bank services usage will not be overcome. This is emphasised by Claessens (2006) who argues that the availability of financial services can be deemed as a necessary condition, but not a sufficient condition when it comes to usage. With this background, our work focuses on further investigation into the demand-side drivers of financial service usage, specifically, (mis)trust in financial institutions while controlling for other factors that influence this phenomenon. This is useful in further understanding the financial system in its interaction with consumers.

A relevant perspective in understanding the drivers of use of financial services in the market is that offered by Claessens (2006). He postulates a model explaining why consumers might decide to self-exclude from using formal financial services in the economy despite the availability of supply. In this model, consumer exclusion is said to occur in two forms: voluntary and involuntary. The occurrence of factors such as individual expectations of rejection based on beliefs on income and price requirements and consumer ill awareness of formal bank services are argued to lead to voluntary self-exclusion. Our work categorises the phenomenon of lack of trust in financial institutions to be under the voluntary self-exclusion segment. On the other hand, the occurrence of factors such as discrimination and supplier requirements for customers in terms of

income, price, and riskiness are categorised in the involuntary exclusion. Table 1 below summarises this model.

Table 1: Difference between Access and Use

A	B	C
Current consumers of financial services	**Voluntary exclusion**	**Involuntary exclusion**
	▪ No need (No financial awareness) ▪ Expected rejection (Inability to use due to price/income) ▪ **Lack of trust** (element of our argument)	▪ Rejected (High Risk/bad credit record and discrimination) ▪ Excluded due to price, product, income or respondent features
Access and use	**Access, but do not use**	**No access**

Source: Claessens (2006)

The model above considers a difference between access and use of financial services. Access is argued to simply refer to the availability of financial services of reasonable quality and cost, where both reasonable quality and cost are relative to some objective standard. In the Claessens (2006) model, people in group A have access and use of financial services. On the other hand, group B consists of people with access, but who do not want to use financial services (voluntary exclusion) in the financial system. Lastly, group C is considered as involuntary exclusion because they have no access, hence, cannot use financial services. Therefore, Claessens (2006) considers access to be A + B, in that, people who use financial services in category A obviously have access.

With the foregoing background, we contribute to further understanding of potential voluntary exclusion factors that affect access to, and utilisation of financial services. Specifically, we consider the role of mis(trust) as a driver of service use and potential factors in self-exclusion from the financial system. As will be demonstrated in the literature review, there is limited literature on the topic of individual (mis)trust in financial institutions and its influence on financial service utilisation.

III-1.2 Context and Definition of Trust

In this section, we briefly seek to offer a definition and context in which the trust variable is considered in our research.

Considering an individual (investor), they can be said to trust if they voluntarily offer their endowment (resources) to a third party (trustee) void of any legal commitment from them. Further, this act of trust is anchored on the investor's expectation and goal that their investment will earn a return soon. In this scenario, the investor is better off in an event that the trustee is trustworthy, and the reverse is true (Guiso, 2012).

According to Coleman (1990), trust is considered as an individual behaviour; where the guiding principle is that the trusting individual 'reveals their willingness to accept vulnerability (risk) based upon positive expectations of the intentions or behaviour of the other person (or representative of an organization)'. Meaning, the trust act is facilitated by the expectation that an individual – for instance, a consumer of a financial service places on the provider (supplier of financial services) hoping they will not exploit them by offering a scam, inaccurate information, or misusing their good faith. To put it in another way, the belief that the provider will handle themselves in an honest and fair manner during the transaction with the customer is what drives the act of trusting in the market. Therefore, trust reflects an individual's willingness to accept social risk. Social risk is the risk attached to the possibility of a betrayal from another individual and as a result, incur losses in the process. This risk is not the same as the risk that arises from bad luck, the intrinsic risk that occurs because events in life are subject to chance (Rousseau et al., 1998).

In our work, we use individual self-reported (mis)trust in financial institutions by respondents in the dataset.

III-1.3 Chapter Objectives and Contribution to Extant Literature

This chapter of our thesis considers the following objectives: i) Investigate the role of an individual's (mis)trust in financial institutions in their use of formal and informal services simultaneously ii) Establish whether the type of financial institution trusted (trust formal, semi-formal, and informal) has a varying effect on a consumer's use of formal and informal financial services iii) Compare the strength of influence between mis(trust) and other factors that have been modelled to drive financial service use in current literature and; iv) Develop possible policy, regulatory and project implications.

The aforementioned objectives and chapter approach are summarised in figure 3, in the next section.

In this empirical analysis, we contribute to the extant literature on factors that affect consumer utilisation of financial services in the economy. Specifically, we investigate the role of an individual's (mis)trust in financial institutions on their use of both formal and informal financial services. Our modelling of both formal and informal services simultaneously is one of the contributions of this paper to the current literature. We employ a bivariate probit model to empirically assess the role of mis(trust) in the use of formal and informal services. The use of this approach is critical as the unobserved factors in the two equations are established to be correlated. Therefore, modelling the two equations, use of formal and informal services separately has high potential of causing bias and inefficiency in our model estimations. Further, modelling them together offers an interesting opportunity into understanding behaviour of

consumers when they use the two services simultaneously. The consideration of the informal sector is very relevant in the Sub-Saharan African region as they account for a good proportion of consumers and is evidenced in the 56 percent proportion that was established to be using both services in our data set. Therefore, our consideration of the informal sector is equally one of our key contributions to the extant literature on this topic.

Additionally, our research segments the types of trust in financial institutions into three categories: trust formal, semi-formal, and informal financial institutions. In the FinAccess survey, we separate the type of trust into the above categories. These trust variables are generated from an individual's self-reported trust in the different types of financial institutions (formal, semi-formal, and informal). This measure differs from general societal (mis)trust that has been widely used in the current literature. Therefore, using this segmented (mis)trust variable, we further contribute to empirically assessing if the role of trust in the use of services varies by trust type exhibited by an individual.

Further, with a rich data set that captures factors that have been established to affect the use of financial services in the Sub-Saharan African region, we allocate some time to look at how our key explanatory variable of consideration, (mis)trust in financial services compares with these factors in terms of the relative size of influence (considering size of marginal effects).

Another key aspect of our work is that we assess the role of mis(trust) at two stages. The overall on formal and informal services, and then consider two example types of financial services, banking, and informal savings groups. In the current literature, a specific financial product is considered, mostly the stock market and savings services. In this regard, we also contribute to broadening the picture of the role of (mis)trust in the financial sector.

Lastly, we contribute to the literature by generating new and interesting explanatory variables that have not been explored in the current literature. This was possible by the wide range of variables that are contained in the dataset we employ.

To the best of our knowledge, the above contributions that our research piece claims have not been explored in extant literature. Our literature review section will offer a more detailed account of areas that have been investigated thus far.

In terms of a conceptual framework, this chapter is built on the analytical framework established by Beck and de la Torre (2007), who started the conversation on acknowledging the role of both economic and non-economic constraints in access to, and utilisation of formal financial services. Further, the aforementioned framework will also be complemented by that of Claessens (2006) which has already been discussed in the above sections.

Combined with the findings in chapter three on determinants of (mis)trust in financial services, our findings in this chapter are useful in understanding the factors that influence mis(trust) in financial services and how it affects service utilisation. Therefore, helpful in developing initiatives aimed at improving trust and ultimately reducing the proportion of consumers that potentially self-exclude from the financial sector or have adverse attitudes towards registration for services.

III-3.0 LITERATURE REVIEW

With the gap that generally exists on the role of (mis)trust in the use of both formal and informal financial services, there is great potential for our empirical analysis to contribute to the currently limited literature. In exploring and understanding the extant literature, our review is grouped into the following issues or gaps that we identify and seek to address: i) the literature has only attempted to explore this phenomenon on formal financial services ii) the use of general societal (mis)trust as a proxy for (mis)trust in financial services iii) limited context and explanatory variables and lastly, limited empirical analysis for SSA research that has been attempted.

In the limited existent literature (Beckmann et al., 2017; Baidoo et al., 2019; Dupas et al., 2012; CBK and FSDK, 2015), an attempt has been made on investigating the role of consumer (mis)trust in financial service utilisation. The highlighted literature solely attempts to investigate this phenomenon using the case of formal financial services, as highlighted below.

In Dupas et al. (2012), a case of bank services was employed in understanding this phenomenon. This research was set up in form of an experiment, using the Randomised Control Trials (RCTs) approach. For all the initially unbanked people who were selected to be part of the treatment group, fees were waived, and difficulties of opening accounts were reduced. Thereafter, it was observed that 63 percent of the selected individuals (treatment group) opened an account. However, in the 18-month period that followed, two or more account deposits were only

made by 19 percent of the individuals that opened accounts. In further understanding the unexpected occurrence, a survey was conducted, and the following three reasons were indicated as the main cause for the lack of use of the financial services in the experiment: Firstly, people cited a lack of trust in banks keeping their deposits safe. Secondly, services were said to be very unreliable. And lastly, people referred to prohibitively expensive withdrawal and other transaction fees as a reason for not using the services.

Another relevant article is that of Beckmann et al. (2017), who investigated how trust in financial institutions influences an individual's selection of a saving instrument in the financial system. Using data from emerging markets in Central, Eastern, and South-eastern Europe, they establish that trust in financial institutions increases the probability of holding formal savings as well as diversification of such instruments. Further, they observe a significant association between holding contractual and capital markets savings instruments and trust in the financial system (such as trust in foreign banks).

Like the Dupas et al. (2012), the Beckmann et al. (2017) work only models the formal sector, hence, do not consider the influence of the informal sector which is critical especially in the Sub-Saharan African region context. However, they touch on the aspect of informality which they define as holding cash. This consideration of informality is limited in scope as informal services in our region of focus are more sophisticated or diverse beyond cash holding. For example, they include services such as

informal savings groups[25], merry-go-round[26], community shop[27] services, and use of family and friends[28] as well as holding of cash when it comes to the saving aspect. Therefore, the informal aspect as attempted in the Beckmann study is not robust enough for developing countries in the Sub-Saharan African region. Further, on context, Beckmann et al. (2017) consider the European financial market which is widely developed relative to markets in developing countries in the Sub-Saharan African region. For instance, the countries in the SSA region are characterised by underdeveloped capital markets, hence, a projection of results from this study onto the aforementioned region would not be very reliable. Additionally, because of context, some variables have been left out in the Beckmann et al. (2017) work that are key in modelling our consideration. Therefore, given the attributes or contributions, an investigation into this topic using the African financial sector market is relevant and appropriate in understanding this topic.

Like the Beckmann et al. (2017) research, Baidoo et al. (2019) investigate the role of trust in use of formal savings in the financial system. This paper establishes a positive relationship between trust and saving in a financial institution. This research suffers from the limitation exposed in the

[25] Community groups that are self-selected. They have a constitution, leadership and meet to save and get credit at agreed interest rates and repayment period.
[26] This is less organised relative to the savings groups. Here a small group of individuals take turns to receive money from scheme members at the end of the month. Each member as a month in which they receive money.
[27] These are credit services offered by community shops.
[28] Savings and credit use through family and friends in the community.

Beckmann et al. (2017) literature as it also ignores the role of the informal sector service provision.

As detailed above, the current literature (Beckmann et al., 2017; Dupas et al., 2012; CBK and FSDK, 2015; Baidoo et al., 2019) have mainly focused on investigating the role of (mis)trust in formal financial service utilisation such as banking services, financial assets, and insurance services. Therefore, the literature on informal financial services is very limited. This occurrence, of not understanding informal financial services is very detrimental in the Sub-Saharan African region because informal financial services have been growing and role in consumer financial management. Therefore, our work seeks to address this gap.

Informal financial services have been established to supplement formal services in the market (CBK and FSDK, 2015; Zambian FinScope, 2015, Tanzania FinScope, 2017). This is evidenced in the 56 percent of survey respondents who were observed to be using both, formal and informal services simultaneously, in our dataset (CBK and FSDK, 2015). This is the occurrence that led to our use of the bivariate probit model, in this chapter. This occurrence of using informal and formal services simultaneously is interesting in two parts; at the modelling level, treating the use of these two types of financial services in separate models (for example using two separate probit models) might lead to bias and inefficiency in model estimations because of the potential correlation of the unobserved factors in the two equations. Secondly, modelling them together offers an interesting opportunity into understanding consumer behaviour when they use these services simultaneously. This is another

contribution of our research to the investigation of this phenomenon. Empirically assessing the use of formal and informal services simultaneously, is key as most people use them in such a manner, as demonstrated above. Given the foregoing, our work considers both formal and informal financial services in the empirical estimation.

The current limited empirical literature investigates the phenomenon under consideration using general societal (mis)trust. General societal (mis)trust looks at individuals' overall trust in their communities. In the paper by Baidoo et al. (2019), general societal (mis)trust is employed. This work explores the role of trust in the use of formal savings in the financial system. They establish a positive relationship between general societal trust and saving in a financial institution. Apart from the limitation of only considering formal financial services, this research uses a general measure of (mis)trust in society as a proxy for (mis)trust in financial services. Using this aggregated proxy for (mis)trust does not provide a lot of insights on its influence in service utilisation due to limitations highlighted in the sections below.

Similarly, Guiso et al. (2004) uses general societal trust and establishes that individuals that are less trusting in society are less likely to buy stocks relative to their counterparts who are trusting. Additionally, (Balloch et al. (2015); Deli and Mylonidis (2015) argue that literacy in the stock market and trust are key drivers in stock market participation. In risky investment, El-Attar and Poschke (2011) reach a similar conclusion as those with less or no trust is established to be less likely to invest in such assets. Jin et al. (2016) establish that in China, foreign ownership of listed firms' increases

with an increase in societal trust. These studies consider the overall societal trust and how it influences an individual's decision in economic activities. Our work specifically focuses on the role of (mis)trust in financial service use and employs self-reported trust in financial services and not the overall societal trust as generally used in the current literature. We employ three specific types of trust in financial institutions; trust formal, semi-formal, and informal institutions respectively.

As highlighted above, the second issue identified is the use of general societal (mis)trust in investigating this phenomenon. The literature (Guiso et al., 2008; Beckmann et al., 2017; Jin et al., 2016; Balloch et al., 2015; Deli and Mylonidis, 2015; El-Attar and Poschke, 2011) under consideration employs an aggregated approach to trust using societal (mis)trust. However, considering individual reported specific (mis)trust in financial services provides more insights. The main reason why the current literature has been employing societal (mis)trust has been the unavailability of appropriate data. Therefore, our work does not employ the societal (mis)trust variable. Further, our work also disaggregated the (mis)trust variable into the specific types of financial services such as formal, semi-formal and informal services. Therefore, as indicated in the objectives section, we aim to establish whether the influence differs across the type of trust by possessed the consumer.

Further, the extant literature (Guiso et al., 2008; Beckmann et al., 2017; Balloch et al., 2015; Deli and Mylonidis, 2015) has concentrated on limited explanatory variables. Therefore, our research contributes to the literature with a variety of explanatory variables, those that have been modelled

already and new ones. This will be discussed in detail in the empirical model section.

The above situation has mainly been influenced by the type of markets (in most cases developed) and datasets that the extant literature has employed. For example, Beckmann et al. (2017) considered a developed financial system, hence, does not fully represent and account for under-developed systems in the Sub-Saharan Africa region. Therefore, with the foregoing, an investigation into this topic using a case of an African financial system is timely and insightful.

In the current literature (Beckmann et al., 2017; Baidoo et al., 2019; Dupas et al., 2012; CBK and FSDK, 2015), the use of formal and informal financial services has been analysed separately in understanding this phenomenon. This may lead to biases and inefficiency in the estimations as two equations, use of formal services and use of informal services may be influenced by the same unobserved factors. Therefore, to address this potential problem, our empirical analysis employs a bivariate probit model because individuals in the data set could use formal and informal financial services simultaneously.

Further, in the key literature (Dupas et al. 2012) that we seek to contribute on, they only went as far as establishing the proportion of individuals in the treatment group who identified lack of trust as a barrier to their utilisation of financial services. Given Dupas et al. (2012), our work contributes to empirically assessing the influence of mis(trust) by establishing the size of its influence given other factors that have been

fully explored in literature. Additionally, RCTs have been a breakthrough in the investigation of financial inclusion and other social phenomena, however, they possess limitations such as small sample size, the difference in contexts, as well as small variations in experimental designs that can affect results (Ravallion, 2009). Additionally, Dupas et al. (2012) only consider the Western region of Kenya, hence, limited in results inference compared to our analysis which uses a nationally representative sample across Kenya. This nationally representative sample offers potential for further inference of our results to other African countries in the region.

With the above-highlighted differences between current literature and our work, we contribute to bringing a new perspective in understanding the role of consumer (mis)trust in financial institutions in their use of financial services.

III-3.2 Conceptual Framework

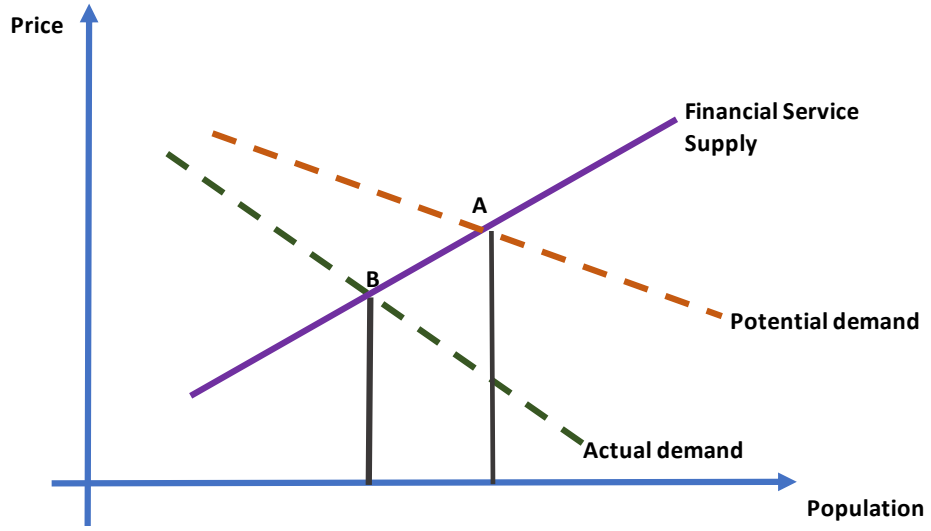
This section presents the conceptual framework that is being employed in investigating the phenomenon under consideration.

In financial inclusion literature, Beck and de la Torre (2007) are considered to be one of the main scholars that organised (in an easy-to-understand analytic framework) and pioneered the investigation into economic[29] and non-economic[30] factors that hinder access and effective utilisation of financial services in developing economies. Their analytic framework identifies and defines access frontiers for the demand and supply of savings and payment services from banks.

Our work benefits from the conceptual framework (basic consumer theory or supply and demand) as developed by Beck and de la Torre (2007) in our investigation of the role of consumer (mis)trust[31] in financial institutions in consumer financial service utilisation. This conceptual framework is also complemented by the Claessens (2006) model that highlights types of exclusion (voluntary and involuntary) as discussed in the above sections. The framework is summarised in figure 3 below:

[29] Mainly price and income.
[30] Factors outside income, price, employment status to looking at socio-cultural factors Beck and de la Torre (2007).
[31] Which is a non-economic barrier.

Figure 3: Potential versus Actual Demand for Formal Bank Services



Source: Adapted from Beck and de la Torre (2007) figure 2

In figure 3, arguing from the perspective of demand, if demand was solely dependent on economic factors, such as price as set by the market and an individual's income, we would find ourselves at point A. However, it is argued that the demand for banking financial services in developing economies is at point B, suggesting that consumer demand is not only explained by economic factors but by non-economic factors too (Beck and de la Torre, 2007). At point B, some consumers may self-exclude themselves from the financial system despite qualifying for such services based on economic factors such as price and income. This may be due to reasons such as negative perceptions of financial institutions, low financial literacy, risk of rejection (Claessens, 2006; CBK and FSD Kenya, 2018) and others that have not yet been explored. This leads to a loss in the potential demand. Therefore, the financial inclusion literature has over the years focused on understanding these non-economic factors that influence financial service use. In our research, we hypothesise that (mis)trust is such one factor.

As can be observed from figure 3, consumer demand has been depicted in two scenarios (curves); the first looking at potential demand if demand was solely determined by economic factors (for example product price and consumer level of income). This scenario is argued to be the potential demand and would consider the following equation:

$$D_{potential\ demand}\ (Formal\ Banking) = f(P, Y), \quad (1)$$

where P is price and Y is income in the equation above.

In the above framework, it is expected that when income (Y) increases, it will lead to an outward shift of the demand curve for formal banking services, thereby, resulting in an increase in overall demand for formal banking services. Additionally, Price (P) is also argued to be key in determining the potential demand in the figure above. It is expected that a reduction in the prices of bank services will lead to a shift along the demand curve, resulting in increased demand.

The second scenario (curve) captures the actual demand (economic and non-economic factors) on the market. It is argued that demand for formal banking services is also determined by socio-cultural factors such as being a minority, gender, financial literacy levels, and rural dwelling (Beck and de la Torre, 2007). Therefore, this second curve puts that into consideration and can be represented by the following equation:

$$D_{actual\ demand}\ (FormalBanking) = f(P, Y, FinL, M, Occ, Loc, G) \qquad (2)$$

Where P is price, ($FinL$) is financial literacy, (M) for minority groups, (Occ) being occupation, (G) IS gender, and (Loc) is the location of the dwelling.

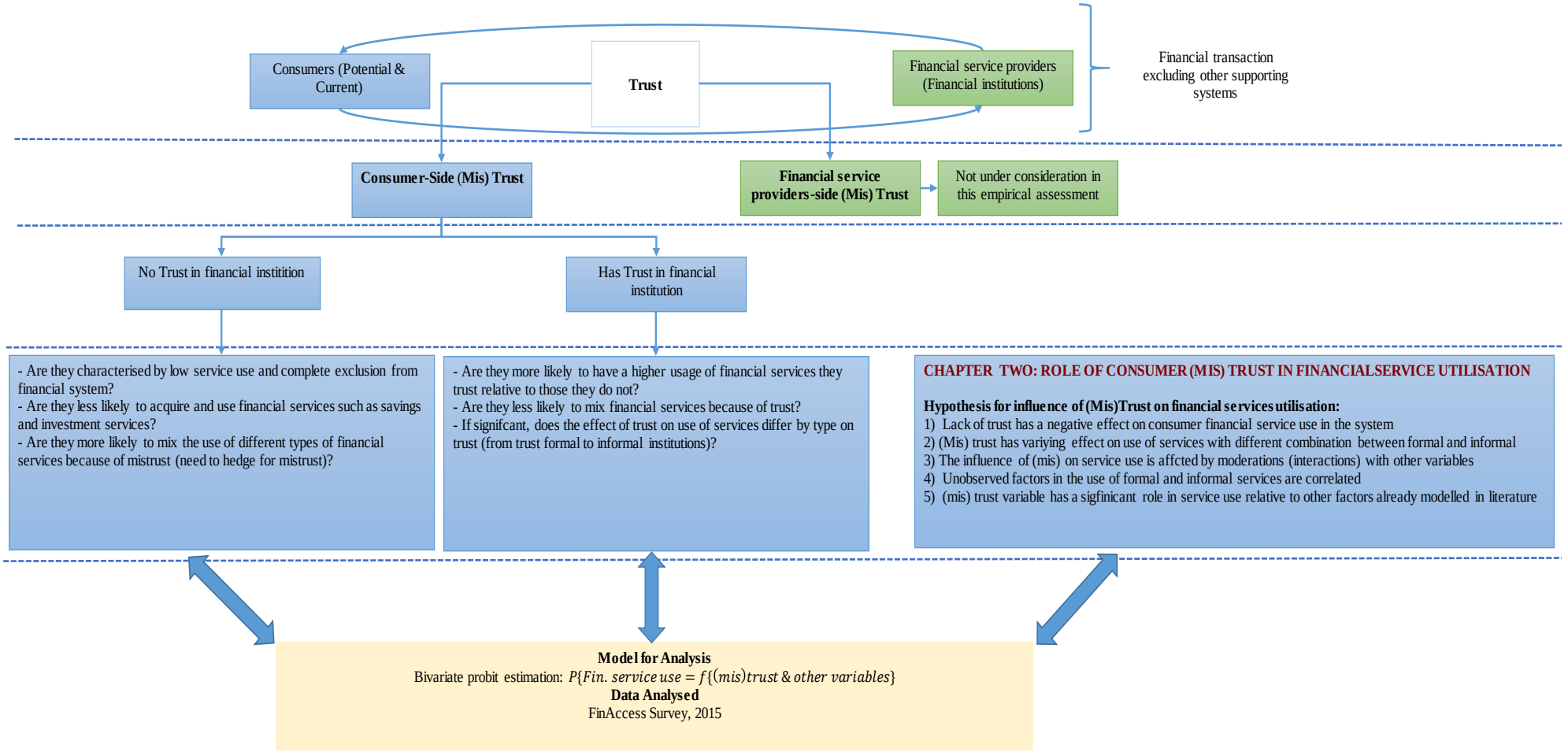
The argument in the above equation has been proven in the financial inclusion literature. Demirgüç-Kunt and Klapper (2012), established that consumers' level of financial literacy (*FinL*) as calculated through financial product awareness and financial numeracy impacts expansion of financial inclusion in the market. We hypothesise that (mis)trust in financial services, a phenomenon that will explore should be a part of the actual demand function.

Further, the extant literature (Demirgüç-Kunt and Klapper, 2012; Claessens, 2006; Rojas-Suarez and Gonzales, 2010; Beck and Brown, 2011) has established that cultural-norms are influential in demand for formal banking services in the financial system. It has also been established that minority segments of the population are most likely to have a different understanding of these products, hence, leading them to self-select out of the formal financial system. Additionally, consumers' state of employment might have an impact on their demand for formal banking services, with those in formal employment having a higher likelihood of demanding a formal banking service. This is so because they need formal registration with government institutions such as revenue authority and likely to be required to have one by an employer for salary payment purposes.

III -3.3 Research Idea and Approach

Given the foregoing sections that have highlighted the gap in the existent literature as detailed in our empirical review and conceptual framework, in this section, we graphically demonstrate our research idea and approach. Figure 4 below gives a summary of our research questions, objectives, contribution, model under consideration, and overall concept of our research approach.

Figure 4: Summary of Idea and Approach



Source: Own graphical depiction of study

III-3.4 Summary Result Findings

In this chapter of the thesis, we empirically assess the role of an individual's (mis)trust in financial institutions in their financial service utilisation. We establish that a consumer's (mis)trust in financial institutions plays a key role in both formal and informal service utilisation. In our bivariate analysis, trust in all three types of financial institutions (formal, semi-formal, and informal) are established to be significant and with a positive effect when a bundle with both formal and informal services is used. Further, in the scenario with exclusive use of formal services, trust in formal institutions is significant and with a positive effect while trust in informal institutions is established to be significant but with a negative effect on an individual's exclusive use of formal services. On the other hand, in the exclusive use of informal services, trust in informal institutions is observed to be significant and with a positive influence while trusting formal institutions has a negative impact on an individual's exclusive use of informal services. In a scenario where neither formal nor informal services are used, trust in any financial institution (from formal to informal institutions) is established to be significant and with a negative effect. Implying that individuals with trust in any type of financial institution are less likely to be excluded from the financial system. Again, this reinforces the relevance of trust in acceptance and use of financial services in the economy.

III -4. EMPIRICAL ANALYSIS

This section is divided into three sub-sections: sub-section one introduces the data; the empirical methodology along with the variables that have been used is presented in sub-section two and finally, sub-section three analyses the obtained results.

III-4.1 Data

This empirical analysis uses data from the Kenya FinAccess Household 2015 Survey. This was the fourth access to finance survey conducted since its inception in 2009. The data under consideration is cross-sectional in nature. The FinAccess, also called FinScope Surveys, aims at generating information to help in understanding demand and supply-side dynamics in the financial sector, specifically looking at access to, and utilisation of financial services in the financial sector. The survey is a nationally representative survey with a sample size of 8,665 households. The survey only considers adult (age 18 and above) respondents. The survey is conducted by the Central Bank of Kenya and other major stakeholders in the financial sector. The survey pays great attention to the quality of the data collected. Over the years methods and techniques have been refined for a better outcome of data collection (CBK and FSDK, 2015).

III-4.2 Context and Definition of Trust

In this section, we briefly seek to offer a definition and context in which the trust variable is considered in our research.

Considering an individual (investor), they can be said to trust if they voluntarily offer their endowment (resources) to a third party (trustee) void of any legal commitment from them. Further, this act of trust is anchored on the investor's expectation and goal that their investment will earn a return soon. In this scenario, the investor is better off in an event that the trustee is trustworthy, and the reverse is true (Guiso, 2012).

According to Coleman (1990), trust is considered as an individual behaviour; where the guiding principle is that the trusting individual 'reveals their willingness to accept vulnerability (risk) based upon positive expectations of the intentions or behaviour of the other person (or representative of an organization)'. Meaning, the trust act is facilitated by the expectation that an individual – for instance, a consumer of a financial service places on the provider (supplier of financial services) hoping they will not exploit them by offering a scam, inaccurate information, or misusing their good faith. To put it in another way, the belief that the provider will handle themselves in an honest and fair manner during the transaction with the customer is what drives the act of trusting in the market. Therefore, trust reflects an individual's willingness to accept social risk. Social risk is the risk attached to the possibility of a betrayal from another individual and as a result, incur losses in the process. This risk is not the same as the risk that arises from bad luck, the intrinsic risk that occurs because events in life are subject to chance (Rousseau et al., 1998).

In our work, we use individual self-reported (mis)trust in financial institutions by respondents in the dataset.

III-4.3 Model Specification

III-4.3.1 Bivariate Probit Model

Given the respondents have utilised more than one type of financial service (formal and informal) simultaneously, we employ a bivariate probit model to examine the effect of mis(trust) in financial institutions on the usage of financial services. This is evident as CBK and FSDK (2015) report that 56 percent of respondents simultaneously used both formal and informal financial services in the system. The use of these two types of financial services simultaneously can be attributed to the unique qualities that each possesses. Therefore, consumers resort to using a bundle containing the two to maximise their utility. Both the formal and informal use of financial services is binary (yes or no) and given the overlap of their usage, separate probit (logit) models are inappropriate due to the presence of common unobserved factors that could influence the choice in the use of the two types of services. These common unobserved factors entail correlation in the disturbance terms of the two equations, use of formal and informal services. Therefore, to control for these common unobserved factors and avoid bias, inconsistency, and inefficiency in our model, we employ the bivariate probit model (Green, 2012).

The bivariate probit model can be expressed as:

$$\begin{aligned} y_{1i}^{*} &= \beta_1 X_{1i} + \varepsilon_{1i} \\ y_{2i}^{*} &= \beta_2 X_{2i} + \varepsilon_{2i} \end{aligned} \tag{3}$$

Where y_{1i}^{*}, y_{2i}^{*} are the two latent dependent variables, X_1 and X_2 are vectors of explanatory variables, and ε_{1i} and ε_{2i} are the disturbance terms assumed

to be normally distributed with zero mean and variance of 1, and correlation ρ.

We observe y_{1i} and y_{2i}, the dependent variables if the latent variable y_{1i}^{*} and y_{2i}^{*} are greater than zero.

$$y_{1i} = 1 \; if \; y_{1i}^{*} > 0, 0 \; otherwise$$

$$y_{2i} = 1 \; if \; y_{2i}^{*} > 0, 0 \; otherwise$$

III-4.3.2 Functional Model

Equations below highlight the functional forms of our bivariate probit model under consideration in our empirical analysis.

$$Use\ fin.services = f(Trust, FinLit, Educ, Sourc\_fin\_info, \text{Finclose}, \text{HHdynamics}, \text{OthercntrlVars}) \quad (2)$$

$$Use\ FS_i = \alpha + \beta_1 Trust_i + \beta_2 FinLit_i + \beta_3 Educ_i + \beta_4 Sourc\_fin\_info_i + \beta_5 \text{Finclose}_i + \beta_6 \text{HHdynamics}_i + \beta_7 \text{OthercntrlVars}_i + \mathcal{E}$$

$$Use\ IS_i = \alpha + \beta_1 Trust_i + \beta_2 FinLit_i + \beta_3 Educ_i + \beta_4 Sourc\_fin\_info_i + \beta_5 \text{Finclose}_i + \beta_6 \text{HHdynamics}_i + \beta_7 \text{OthercntrlVars}_i + \mathcal{E}$$

Where:

FS: Use of formal financial services

IS: Use of informal financial services

Trust: Trust in financial institutions; Finlit: financial literacy levels; Educ: education levels; Source_fin_info: source of financial information; Finclose: financial institutions close to; HHdynamics: household dynamics; OthercntrlVars: other control variables

$\mathcal{E}$: error terms

The two dependent variables highlighted above are observed as discussed in the above generic bivariate model specification above.

III-4.3 Variables

This section details our hypothesis behind each explanatory variable, how it has been considered if already modelled in the extant literature, and lastly, how they are generated in our research.

III-4.3.1 Dependent Variable

Use of formal and informal financial services

In investigating the role of consumer mis(trust) in financial service utilisation, our work employs the use of formal and informal financial services as the dependent variables. This contrasts with the current literature (Beckmann et al., 2017; Baidoo et al., 2019; Dupas et al., 2012; CBK and FSDK, 2015) which has only attempted to investigate the use of formal financial services. In this chapter, we seek to understand this phenomenon when formal and informal financial services are used simultaneously. The section below offers details of variable generation.

Use formal financial services: A dummy variable is created for all individuals using financial services that are formally regulated by the central bank and other statutory bodies. Service providers who offer these services include commercial banks, insurance companies, and microfinance institutions. The generation of this variable was guided by the definition of a formal financial service by the Central Bank of Kenya (CBK and FSDK, 2015).

Use informal financial services[32]: Financial services offered by providers that are not regulated, but with a relatively well-defined organisational structure such as governing constitution and leadership (CBK and FSDK, 2015). This dependent variable is a dummy, it takes a '1' if the respondents use informal financial services and '0' otherwise.

III-4.3.2 Explanatory Variables

Trust in financial institutions: (Mis)trust in financial institutions in the market is the main explanatory variable in our research. In the survey, respondents were asked to indicate the financial institution (financial service provider) that they trust the most. We create dummy variables out of this question, 1 is given to the most trusted financial institution, and 0 otherwise. The following three categories are considered: trust formal, semi-formal, informal financial institutions. Where formal institutions consider the following: commercial banks, insurance companies, and MFIs; semi-formal includes Savings and Credit Associations, banking and mobile money agents; informal includes informal savings groups, shop lenders, and Rotating Savings and Credit Associations (ROSCAs) (CBK and FSDK, 2015).

Our work uses a more specific and self-reported (mis)trust in financial institutions compared to the current literature (Baidoo et al., 2019; Guiso et al., 2004; Balloch et al., 2015; Deli and Mylonidis, 2015; Jin et al.,2016; Beckmann et al., 2017) who use general societal trust (general levels of

[32] Example of services include informal savings groups, Accumulating Savings and Credit Association (ASCAs), shop lenders and Rotating Savings and Credit Associations (ROSCAs).

trust in society amongst individuals). The variable used in our study is generated and disaggregated in three types: (mis)trust in formal financial services, semi-formal, and in informal financial services. In our empirical analysis, we hypothesise that each of the above (mis)trust will have a different effect in influencing consumer financial service utilisation.

No trust in any financial institution: The fourth dependent variable category is that of lack of trust in any financial institution. This dummy considers a proportion of individuals who said they have no trust in any institution. This category is considered to be the base category.

As highlighted above, the trust variable considered in this chapter is dichotomous by nature. For the most part, this was due to the way the variable was captured in the FinAccess Survey, the dataset that we employ in this thesis.

It has to be noted that, the three aforementioned types of trust, a '0' comprises individuals who may just not have trust in that given financial institution but may have in another (for example, no trust in formal services but have trust in informal services), and those who do not have trust in any financial institution. The distinction is very important in our discussion of findings when it comes to perceived 'mistrust' in financial services.

In this estimation, one of the potential disadvantages of having a dichotomous trust variable is that it did not allow respondents to possess multiple 'trust' in financial services. However, from the literature (FinAccess, 2015; FinAccess, 2018) and our findings in this study, we

observe that there exist strong disparities in the use and trust of financial services. Such that, for the most part, individuals have their most trusted service type. Therefore, we did not lose out on anything by having a dichotomous explanatory variable, if anything, this format enabled us to disaggregate the investigation by considering the three types of trust in financial services.

Financial literacy

In measuring financial literacy, literature (Chithra and Selvam, 2013) has mainly employed a measure of an individual's financial numeracy skills. However, Carpena et al. (2011) argue that financial awareness, as well as attitudes towards financial products, should be considered to get a more robust measure of an individual's financial literacy levels. Therefore, this research uses two proxies of financial literacy; numeracy and financial product awareness of an individual. We hypothesise that individuals with higher financial literacy are more likely to use financial services. The two proxies are discussed in detail in the bullets below:

Financial numeracy: This was the index generated from the two numeracy questions[33] that were asked in the FinAccess Household survey. An individual was given 0 (low) if they did not answer any question correctly, 1 (medium) if they answered one question correct, and 2 (high) if they answered both questions correctly (FinAccess dataset, 2015). From the index above, three dummy variables are generated: low financial numeracy, medium financial numeracy, and high financial numeracy is given index scores of 0, 1 and 2 respectively. In the analysis, the low financial numeracy category is used as the base.

Financial product awareness: This score like the numeracy index was derived from the FinAccess questions[34] on product awareness and split into three categories; low, medium and high score respectively. Further, three dummy variables were generated: low financial product awareness, medium financial product awareness, and high financial product awareness. The low financial awareness category is considered the base category (CBK and FSDK, 2015).

[33] The following questions were asked in establishing effective numeracy: 1) "You are in a group and win a promotion or competition for KSh.100,000. With 5 of you in the group, how much does each of you get?" 2) "You take a loan of KSh.10,000 with an interest rate of 10% a year. How much interest would you have to pay at the end of the year?" (Source: FinAccess 2015 Questionnaire).

[34] The following questions were asked under product awareness: 1) "There are many words used in Kenya that apply to, or concern, financial services. Please tell me which of the following have you ever heard of? A list was provided/read to respondent 2) Have you ever heard of these financial providers / government schemes/? List provided/read 3) (Source: FinAccess 2015 Questionnaire).

Educational Status: Another explanatory variable that we considered was an individual's highest level formal education attained. In the extant literature (Tuesta et al., 2015; Fungáčová and Weill, 2015; Camara et al., 2014; CBK and FSDK, 2015; Bönte, 2008; Bachman and Lane, 1996 CBK and FSDK, 2013 Demirgüç-Kunt and Klapper, 2012; Beck and de la Torre, 2007) this variable has been established to have a significant and positive effect on financial service use. Therefore, our work hypothesises a positive relationship. Four dummy variables were generated in understanding this variable: "no education" for individuals without education, "primary education" with primary education, "secondary education", and "tertiary education" for individuals with a certificate and above. The "no education" dummy is used as the base category.

Source of financial information: This variable has not been explored in the extant literature. Our analysis includes this variable because we hypothesis that source of financial information (formal or informal) will influence an individual's decision in financial service utilisation. This variable was generated from the question "*Who do you depend on most for financial advice?"* The variable was grouped into two; informal and formal sources and a dummy variable for formal source was considered in the analysis. In the literature, this has not been modelled before. Formal sources of information include financial institutions, print media, television, and radio. On the other hand, informal sources include information from sources such as friends and family members.

Type of financial institution close to (formal or informal): This variable has been established to influence financial service utilisation (Filipaik, 2015). However, in contrast to the existent literature, we disaggregate the financial institution into formal and informal. Our expectation is that the type of financial institution an individual is close to will influence their behaviour towards financial service utilisation. For example, we expect that individuals close to informal financial services are more likely to use informal services and vice versa. Three dummy variables are generated: close to formal, close to semi-formal, and close to the informal financial institutions.

Female household-head: Wider financial inclusion literature (CBK and FSDK, 2015; Bönte, 2008; Bachman and Lane, 1996 Demirgüç-Kunt and Klapper, 2012) have established that gender has an influence in financial service utilisation. This literature suggests that female household heads are less likely to use financial service relative to informal ones. We include this variable in our empirical analysis to investigate if the findings in current literature (CBK and FSDK, 2015; Bönte, 2008; Bachman and Lane, 1996 Demirgüç-Kunt and Klapper, 2012) apply in a situation where the formal and formal service are used simultaneously. In generating this variable, a dummy variable for a female household heads is generated.

Household financial decision-maker: This variable has also not been modelled in extant the literature. Our work seeks to understand the influence of household decision-making power on financial service utilisation and financial management in the household. Using the survey

question "*Who makes financial decisions in the household*?" a dummy variable is developed for household financial decision-maker.

Vulnerability: In current literature (Bönte, 2008; Bachman and Lane, 1996 CBK and FSDK, 2013; CBK and FSDK, 2015; Demirgüç-Kunt and Klapper, 2012; Beck and de la Torre, 2007) income is used to measure the impact of economic status on financial service utilisation. In our survey, we use the poverty variable generated using a poverty index (Grameen Foundation, 2015). Vulnerability can affect the way an individual interacts with society. In this regard, this variable seeks to investigate if the vulnerability has any influence on the use of financial services. In the FinAccess survey the Progress out of Poverty Index (PPI)[35], a tool of the Grameen Foundation was used in developing poverty or vulnerability categories. The PPI uses household assets and living conditions to establish an individual's likelihood of being poor or not. Our empirical estimation used the PPI index to rank individuals as "least poor", "poor" and "very poor" depending on the score. Using this ranking, our analysis generated a dummy variable most vulnerable using the very poor category. A negative relationship was hypothesised when considering formal institutions and positive for informal financial institutions (vulnerable individuals are less likely to use formal financial institutions).

[35] https://www.povertyindex.org/country/kenya

Another household member has an account: This is another interesting explanatory variable that current literature has not modelled. Our work has incorporated this variable to ascertain whether having a support structure within the household has any influence on financial service use. From the question "does any other household member have an account?", a dummy variable was generated for households with at least two members having access to formal financial services (account). This was only done for households with access to bank accounts. It has to be noted here that the base category comprises people with a second bank account, people who do not use formal services, and people who live alone. The informal services are not considered because it was not asked in the survey.

Control Explanatory Variables

In our empirical analysis, we control for other variables that the literature (Carpena et al., 2011; Bönte, 2008; Bachman and Lane, 1996 CBK and FSDK, 2013 Demirgüç-Kunt and Klapper, 2012; Claessens, 2006; Beck and de la Torre, 2007) has established to be influenced in financial service utilisation. These variables include:

Minority group: This variable is one of the insightful explanatory variables that has recently been explored in the literature (CBK and FSDK, 2015)**.** In this literature, they establish that minority segments of the population are less likely to be financially included. Therefore, we control for this occurrence in our empirical estimation. In our dataset, there is a question on language a respondent is comfortable answering the questions in. A

respondent who mentions English or Swahili (majority languages) will be treated in the majority while the rest will be treated as a minority and hence this study will test if being from the minority background has an influence on the use of financial services in the economy.

Rural dweller: A consensus has been reached in the extant literature on this variable. It has been established that populations in rural areas are less likely to be financially included relative to their urban counterparts. Therefore, we control for this variable and are interested to observe whether its influence is maintained in a scenario when formal and informal services are used simultaneously.

Age: This variable has generated mixed results in financial inclusion literature. We use in our empirical analysis as a control. On age, we expect that young people are more likely to use a bundle with both informal and formal services, and unlikely to consume a bundle with only either one of the financial service types.

Household income: The current literature (Chithra & Selvam, 2013; Tuesta et al., 2015; Fungáčová & Weill, 2015; Camara et al., 2014) has established a higher income is associated with a higher likelihood for individual use of formal financial services. We control for this variable and seek to understand its influence on financial service use when formal and informal services are used simultaneously. Total household income was considered. The income recorded in the survey was in Kenyan Shilling (*USD1=100KSh approximately*). We transformed the income variable into a log form.

Marital status: In controlling for the impact of an individual's marital status, a dummy variable for single individuals is generated. In the existent literature, the results on the influence of marital status in financial service utilisation are mixed.

Youth: The study further tested the idea of whether being a youth influences someone's use of financial services or not. Our expectation is that being a youth should influence the use of formal financial services in a positive direction. We define a youth was defined as a person (respondent) under the age of 30. Therefore, a dummy variable using all individuals under the age of 30 is generated.

Household size: Our empirical analysis controls for household size, a variable that has been observed to influence financial service use in the extant literature (CBK and FSDK, 2015). The expectation is that increase in household size reduces household financial inclusion chances and the use of formal services in the market. In establishing whether dependency levels have any impact on someone's trust in financial institutions, household size was used as a proxy for dependency.

III-4.4 Summary Statistics

In this section, we present the summary statistics for the dependent and explanatory variables considered in our analysis.

Table 3: Summary statistics

Variable	Mean	Std. Dev.	Variable	Mean	Std. Dev.
Trust in financial institutions			**Household dynamics**		
Formal institution	0.397	0.489	Female household head	0.507	0.500
Semi-formal institution	0.337	0.473	Household financial decision-maker	0.420	0.494
Informal institution	0.063	0.245	Vulnerability index-most vulnerable	0.396	0.421
No trust in any institution	0.201	0.400	Household size	164.1	1836
Financial Literacy Proxies			Total household income	161.3	1836
Financial numeracy - high	0.271	0.444	**Other variables**		
Financial numeracy - medium	0.336	0.472	Age	16	16
Financial numeracy - low	0.393	0.489	Minority group	0.229	0.420
Financial product awareness - high	0.286	0.452	Location - rural	0.557	0.497
Financial product awareness - medium	0.350	0.477	Marital status - single	0.390	0.488
Financial product awareness - low	0.364	0.481	**Dependent variables**		
Educational status			Access formal services	0.385	0.487
No education	0.180	0.384	Access informal services	0.457	0.498
Primary education	0.447	0.497	**Type of financial institution close to**		
Secondary education	0.278	0.448	Formal institution	0.059	0.236
Tertiary education	0.095	0.293	Semi-formal institution	0.780	0.414
Experience with financial services			Informal institution	0.067	0.250
Source of financial information -informal	0.900	0.301			
Source of financial information -formal	0.100	0.301			
Number of observations (N)	**8,488**				

In table 3 above, we observe that 38.5 percent of respondents in the survey used formal financial services while 45.7 percent used informal financial services. These figures demonstrate the importance of these two financial services in the Kenyan market and the Sub-Saharan Africa region at large. In terms of our key explanatory variables, we observe that 39.6 percent of respondents indicated formal financial institutions as their most trusted institutions. This was the highest trust amongst the three categories under consideration. Trust in semi-formal financial services scored 33.7 percent while trust in informal was the lowest at 6.3 percent. Further, the category of those who indicated not to trust any of the above financial institutions was significant, it stood at 20 percent.

In terms of the total number of observations, we consider 8,488. As explained in the data section, the drop in the number of observations was mainly driven by non-responses due to 'not applicable' questions. Nevertheless, the drop is not significant to distort our analysis. Details of other variables are as highlighted in the table above.

III-4.5 Test for Multicollinearity - VIF

In assessing the issue of multicollinearity in our estimation explanatory variables, the variance inflation factor (VIF) is employed. We pay attention to evaluating the possibility of multicollinearity as it influences the estimated standard errors which in turn affects which of our explanatory variables are significant.

As a first step in assessing multicollinearity, we conduct a regression of explanatory variables after which we calculate the VIF and tolerance values. In the VIF test, the increase in the variance of estimated coefficients is measured and compared to a situation where correlation is absent among model explanatory variables Menard (2002). When it comes to the general rule of thumb on VIF score's interpretation, literature (Allison, 2012; Menard, 2002 and Menard, 2010) argues that concerns should be raised for VIF scores of 5 or higher (tolerance scores of 5 or less).

In our model, we establish individual VIF values below 4 and overall mean of 1.538. Therefore, our research estimations can be considered acceptable (confident our results are not inefficient due to collinearity).

III 4.6 Potential Endogeneity Problem

In our model estimation under consideration, there is a potential problem of endogeneity in our (mis)trust explanatory variable. In a regression, if the researcher wants to make causal inferences between the dependent and explanatory variables, the latter needs to be exogeneous, meaning, it should not be driven by the unobserved factors in the estimation. Endogeneity occurs when explanatory variables in the estimation are correlated with the error term (Green, 2012). In our estimation, endogeneity could come from two main sources as outlined below.

Firstly, it might be present due to the omission of key explanatory variables (this is called "omitted variable bias") and insufficient sample size. When key variables in the estimation are omitted, this might lead to endogeneity as the predictors will end up being correlated with the error term (Green, 2012). In our case, this might mean that our three "trust" explanatory variables (trust formal, trust semi-formal and trust informal) might be correlated with the error term in the estimation. In our thesis, this source of endogeneity had a very negligible chance of being the source because of the sufficient number of explanatory variables that have been included, and the large sample size that was used in the FinAccess survey (which used a sample size of 8,488 respondents). In our research, we have included explanatory variables that have already been modelled in the current literature, and new variables, which formed part of our contribution to literature as highlighted in this chapter. Therefore, we have sufficient explanatory variables to avoid the occurrence of endogeneity due to omitted variables. This technique of avoiding endogeneity due to

omitted variables by including sufficient predictors is called 'measure-the-measure' (Hausman, 1983).

Secondly, the other potential source of endogeneity is what is referred as "simultaneity bias". This occurs when the dependent variable is also a predictor of the independent variable and does not just simply respond to it. In our study, there is a chance that our key explanatory variables, financial institution/service most trusted (trust formal, trust semi-formal and trust informal) are influenced by the dependent variables (use of respective financial service type; formal, semi-formal, and informal). Specifically, there is a possibility that those who use formal financial services are more likely or are influenced to trust them compared to individuals who do not use them. This might be the case across the other two types of financial services (informal and semi-formal).

The above is a more plausible source of endogeneity in our model compared to the omitted variable bias source discussed in the preceding section. However, to solve this source of endogeneity might require the use of an instrumental variable approach. This approach isolates exogenous variations in the explanatory variable of concern (Green, 2012). However, it is generally difficult to find appropriate IVs in many set-ups, and unfortunately, after a hard consideration, our research failed to find an appropriate IV that could be used in ensuring that this potential problem does not affect our results.

In going around this problem, we used the estimation in chapter two, determinants of trust in financial services. In this chapter, we explored factors that determine trust in financial services. In this estimation, we

added the use of service type (formal, semi-formal, and informal services), and established that service use was insignificant in determining trust in a financial institution. Therefore, this implies that type of service used is less likely to influence trust in financial institutions/services, hence, unlikely to cause endogeneity through "simultaneity bias"

Given the above discussion that has demonstrated that we cannot completely rule out the potential problem of endogeneity caused by "simultaneity bias", our results should be considered to be reflecting correlations and not causality.

Given the above discussion, we cannot completely rule out a chance of endogeneity caused by "simultaneity bias" but we are confident of the results given the steps (using chapter 2 results) we used to go around the issue of using an instrumental variable which we could not find.

III-5.0 Results and Discussion

After the bivariate probit estimation, we use the Wald test to ascertain if the coefficients (β) are not all equal to zero. In the estimation, we obtain a chi-square (χ^2) of 1469.55, 44 degrees of freedom, and a p-value of 0.00. Therefore, we reject the null hypothesis that the coefficients in our estimation are all jointly equal to zero. Hence, including all the explanatory variables improves the model fit.

In table 5 below, we estimate the bivariate probit model of the two dependent variables, use of formal and use of informal financial services respectively. In the bivariate probit model, we consider the following four scenarios: i) when both formal and informal services are used (Biprobit 1); ii) when only formal services are used exclusively (Biprobit 2); iii) when only informal services are used exclusively (Biprobit 3); and finally, iv) when both formal and informal services are not used (Biprobit 4). We consider the following categories for the model explanatory variables: (mis)trust in financial institutions (our key explanatory variable), financial literacy, educational status, household dynamics, and other controls variables depicting factors already modelled in current literature that influence the use of financial services. The section below offers a discussion of findings from our empirical estimation.

In discussing the effect of trust on the use of formal and informal services, we use the four scenarios estimated in our model.

Table 5: Role of (Mis)trust in Financial Service Utilisation Estimation (Marginal effects)

Probit and bivariate probit results, marginal effects				
	Biprobit 1 (1,1)	**Biprobit 2 (1,0)**	**Biprobit 3 (0,1)**	**Biprobit 4 (0,0)**
Explanatory Variable	**formal=1, informal=1**	**formal=1, informal=0**	**formal=0, informal=1**	**formal=0, informal=0**
Trust in financial institution (base=no trust)				
Trust formal financial institution	0.156(0.013)***	0.060(0.012)***	-0.024(0.014)*	-0.192(0.015)***
Trust semi-formal financial institution	0.118(0.014)***	0.019(0.012)	0.014(0.015)	-0.152(0.016)***
Trust informal financial institution	0.166(0.027)***	-0.082(0.011)***	0.150(0.027)***	-0.234(0.017)***
Financial literacy (base=low numeracy and awareness)				
Financial numeracy – high	0.059(0.011)***	0.054(0.011)***	-0.047(0.012)***	-0.066(0.014)***
Financial numeracy – medium	0.030(0.010)***	0.031(0.009)***	-0.028(0.011)***	-0.033(0.013)***
Financial product awareness – high	0.152(0.013)***	0.091(0.012)***	-0.071(0.013)***	-0.172(0.015)***
Financial product awareness – medium	0.102(0.011)***	0.032(0.010)***	-0.007(0.012)	-0.127(0.013)***
Educational status (base=no education)				
Primary education	0.103(0.014)***	0.002(0.013)	0.041(0.015)***	-0.146(0.017)***
Secondary education	0.163(0.018)***	0.061(0.015)***	-0.037(0.018)**	-0.187(0.017)***
Tertiary education	0.283(0.027)***	0.184(0.025)***	-0.179(0.016)***	-0.288(0.018)***
Experience with financial services				
Source of financial information -informal	0.062(0.015)***	0.067(0.014)***	-0.059(0.014)***	-0.069(90.017)***
Number of observations	**8,488**			
Rho(ρ)	**0.208*** **			
Wald chi-square χ^2(44)	**3063.38**			
Prob > chi-square	**0.000**			

***Significance to 1%; **Significance to 5%; *Significance to 10% Note: robust standard error figures in parenthesis with marginal effects in front

Table 5: Role of (Mis)trust in Financial Service Utilisation Estimation (Marginal Effects) continues

Probit and bivariate probit results, marginal effects

	Biprobit 1 (1,1)	**Biprobit 2 (1,0)**	**Biprobit 3 (0,1)**	**Biprobit 4 (0,0)**
Explanatory Variable	**formal=1, informal=1**	**formal=1, informal=0**	**formal=0, informal=1**	**formal=0, informal=0**
Type of financial institution close to (base=informal)				
Formal institution	-0.024(0.017)	0.087(0.022)***	-0.104(0.017)***	0.041(0.027)
Semi-formal institution	-0.017(0.011)	0.035(0.010)***	-0.059(0.014)***	0.042(0.014)***
Household dynamics				
Female household head	0.085(0.0116)***	-0.043(0.009)***	0.092(0.013)***	-0.135(0.013)***
Household financial decision-maker	0.029(0.008)***	0.047(0.008)***	-0.050(0.010)***	-0.026(0.011)**
Vulnerability index-most vulnerable	-0.016(0.008)**	-0.032(0.007)***	0.037(0.010)***	0.011(0.011)
Household size	-0.003(0.002)**	-0.005(0.002)***	0.005(0.005)**	0.003(0.002)
Total household income	0.074(0.004)***	0.042(0.003)***	-0.024(0.004)***	-0.092(0.005)***
Other Variables				
Age	0.003(0.00)***	0.002(0.000)***	-0.001(0.000)***	-0.003(0.000)***
Minority group	-0.013(0.010)	-0.049(0.008)***	0.067(0.012)***	-0.005(0.013)
Location – rural	-0.032(0.008)***	-0.058(0.008)***	0.063(0.009)***	0.027(0.011)**
Marital status – single	-0.102(0.009)***	0.036(0.009)***	-0.101(0.010)***	0.167(0.013)***

Number of observations **8,488**

Rho(ρ) **0.208*****
Wald chi-square χ^2**(44)** **3063.38**

Prob > chi-square **0.000**

***Significance to 1%; **Significance to 5%; *Significance to 10%
Note: robust standard error figures in parenthesis with marginal effects in front

5.1.1 Biprobit 1: Both formal and informal financial services used

In the first scenario, when both formal and informal services are used, our results suggest that trust in any financial institution (formal, semi-formal, and informal institution) is significant and with a positive effect on the use of such a financial service bundle. In this scenario, trust in informal institutions has a relatively bigger marginal effect (16.6 percentage points) compared to formal trust at 15.6 percentage points and semi-formal trust at 11.8 percentage points.

5.1.2 Biprobit 2: Formal used and informal financial services not used

Considering the second scenario, when only formal services are used, we observe that trust in formal financial institutions is significant and with a positive effect (6 percentage points) on the use of such services. Therefore, individuals with trust in formal financial institutions are more likely to use formal services exclusively. On the other hand, individuals that have trust in informal financial institutions are found to be less likely to use formal financial services exclusively. Trust in informal institutions is significant with a marginal effect of minus 8.2 percentage points. Put differently, the results in this scenario entail that trust in informal financial institutions has a negative effect on the exclusive use of formal services.

5.1.3 Biprobit 3: Formal not used and informal financial services used

Further, in the third scenario, when only informal services are utilised, we find consistent results as those in the second scenario above, except that they are in reverse. Trust in informal institutions is significant and with a positive of 15 percentage points. Therefore, individuals with trust in

informal institutions are more likely to exclusively use informal financial services. In contrast, individuals with trust in formal financial institutions are less likely to use only informal services. Trust in formal institutions was found to be significant and with a marginal effect of minus 2.4 percentage points. Phrased differently, this means that trust in formal financial institutions has a negative influence on the exclusive use of informal services.

5.1.4 Cross influence of financial service trust

One interesting finding in this section is the observation on the negative impact that trust in a different financial service has on the use of another financial service type. In our estimation, we establish that consumers who trust formal financial services are less likely to use informal financial services. The opposite is true, individuals who trust informal financial services are less likely to use formal financial services. Given this result, the two trust types should be given some attention as they impact the use of either financial service negatively.

5.1.5 Biprobit 4: both formal and informal financial services not used

In the last scenario, when neither formal nor informal financial services are utilised, all three types of trust (trust formal, semi-formal, and informal) are established to be significant and with a negative effect. Implying that individuals with trust in any type of financial institution are less likely not to use any of the two types of services, formal and informal. This is very consistent with the results in the other scenarios above. This implies that they are less likely to be excluded from the financial system relative to

their counterparts without trust in any financial institution. This reinforces the argument of the relevance of trust in the use of financial services. Therefore, policymakers, regulators, and development organisations should pay some attention to this aspect as they embark on financial inclusion initiatives.

5.1.6 Explanatory Variable Comparison

Comparing the influence of trust on use of financial services with other explanatory variables that have been modelled in literature and included in our estimation (Carpena et al., 2011 on financial literacy; Bönte, 2008; Bachman & Lane, 1996 on proximity to financial institutions; CBK and FSDK, 2013 on household income and gender of head of household), trust in formal and informal institutions is established to have the second biggest marginal effects (15.6 and 16.6 percentage points respectively) when both formal and informal financial services are used. Having tertiary education was established to have the biggest (with 28.3 percentage points) when both formal and informal services are utilised. These results demonstrate the relevance of the (mis)trust variable in influencing consumer acceptance and use of financial services. With consumer trust in the financial system, consumers are more likely to listen to their financial advisors more and take up services such as savings and investment ventures. This is key in catalysing the impact of financial services on consumers but also on the growth of the financial sectors. This coupled with an understanding of what determines (mis)trust in financial services can be helpful in policy and design of interventions aimed at addressing

the low financial inclusion and use of financial services in the Sub-Saharan African region.

Another finding worth noting comes from the variable that looks at the most vulnerable proportion of the population (named 'most vulnerable'). This variable is generated using the Progress out of Poverty Index[36] quintiles. The variable is established to be significant in our estimation. We establish that in terms of use of financial services, the most vulnerable in the population are pushed out of formal financial services as they are less likely to use both formal and informal services combined (minus 1.6 percentage points), less likely to use formal services exclusively (minus 3.2 percentage points) but instead, are more likely to use informal services exclusively (3.7 percentage points) or be completely excluded from the financial sector as they are less likely to use none of the services, formal or informal (1.1 percentage points). This result consistent with current literature (CBK and FSDK, 2015; De La Torre, 2007).

Additionally, the variable for a female head of household provides an insightful outcome too. It is found to be significant with a positive effect (8.5 percentage points) on the use of both formal and informal services combined. In scenario two, use of formal services only, the variable is significant with a negative effect (minus 4.3 percentage points). Therefore,

[36] In the FinAccess survey, the Progress out of Poverty Index (PPI), a tool of the Gramean Foundation was used in developing poverty or vulnerability categories. The PPI uses household assets and living conditions to establish an individual's likelihood of being poor or not. The survey used the PPI index to rank individuals as "least poor", "poor" and "very poor" depending on the score.

female household heads are less likely to use formal services exclusively compared to their male counterparts. However, female household heads are more likely to use only informal financial services (9.2 percentage points) compared to their male counterparts. And they are observed to be less likely not to use any financial services. An indication of their reliance on some form of financial service in their day-to-day financial management.

Further, we generated financial literacy proxies from an index created from an individual's financial product awareness and financial numeracy. We establish that individuals with a medium and high score in product awareness and financial numeracy are more likely to use a bundle with formal and informal services in the market relative to those with low product awareness and financial numeracy scores. Additionally, they are also likely to use only formal financial services exclusively relative to their counterparts with low attributes. On the other hand, this proportion of individuals with medium and high scores in product awareness and financial numeracy are less likely to use informal services exclusively. Individuals with these attributes are also observed to be less likely not to use any services, formal or informal in the market. Implying that they are less likely to be excluded completely from the financial system. Therefore, they are heavily reliant on some form of financial service in their financial management.

Considering individual's educational attainment, individuals with primary, secondary, and tertiary education are more likely (10.3, 16 and 28.3 percentage points respectively) to use both formal and informal financial

services relative to individuals without any form of education. As can be observed from the marginal effects, tertiary education has the biggest effect (28.3 percentage points) on the use of both formal and informal services. This is very consistent with the literature (Tuesta et al., 2015; Fungáčová and Weill, 2015; Camara et al., 2014; CBK and FSDK, 2015; Bönte, 2008; Bachman and Lane, 1996 CBK and FSDK, 2013 Demirgüç-Kunt and Klapper, 2012; Beck and de la Torre, 2007) on this topic. For example, in the latest FinAccess survey, people with formal education are established to be the largest segment of people who used formal financial services (CBK and FSD Kenya, 2018). In the use of formal services only, secondary and tertiary educational status are established to have a positive effect on this scenario with marginal effects of 6.1 and 18.4 percentage points respectively.

Like in the first scenario, tertiary education has the biggest effect. In the third scenario, the use of informal services only, having secondary and tertiary education are significant with a negative effect (minus 3.7 and minus 17.9 percentage points respectively). Therefore, individuals with secondary and tertiary education are less likely to use only informal services compared to individuals with no formal education. On the other hand, having a primary education is also significant but with a positive (4.1 percentage points) effect on the exclusive use of informal services. Lastly, all the three forms of educational attainment are significant in the last scenario, where both formal and informal services are not used. In this scenario, all three educational attainments have a negative effect on the likelihood of being completely excluded in the use of financial services. This might insinuate that any form of education at least pushes people away from total financial exclusion.

In the bivariate probit estimation, we observe a significant rho (p=0.000). The sign of the rho is established to be positive (0.208) which suggests that the error terms in the use of formal and informal financial services are positively correlated. This is so because, in the survey, consumers can select all the financial services they use, from formal to informal. This was done in order to get an accurate picture of the market that is close to reality. In our estimation, we observe that 56 percent of individuals in the survey used both formal and informal services simultaneously. Which makes sense because of the difference in unique attributes found in formal and informal services that might lead a consumer into using both types of services in order to maximise their utility. For example, informal financial

services are also used as social networks and for organising social and family activities. Therefore, given the significant and positive correlation in the error terms, of the two equations, use of formal and informal financial services, the use of a bivariate probit model in our research is justified as using separate probit models would have led to model misspecification (specifically bias, inconsistency and inefficiency). The difference between the two approaches, the use of separate probit models, and use of a bivariate model is manifested in the change in coefficients and marginal effects between the results obtained from these models.

5.1.7 Explanatory Variable Interaction

Further, we consider variable interactions in our analysis. The results of these interactions are represented in Table 11 of chapter three appendix. In the first interaction, we consider 'trust in formal financial services' and one identifying as a minority. When estimated together, as an interaction, trust in formal institutions and identifying as a minority yield a negative and significant coefficient in the estimation. This implies that despite having trust in formal financial services, an individual from the minority population is likely to undermine the trust in financial institutions in the use of financial services as illustrated in above the sections. Interacting female household head and secondary educational attainment yields a significant interaction with a negative effect on the use of informal financial services. Therefore, secondary education pushes female household heads away from the use of informal services. On the other hand, interaction with primary education is significant and yields an opposite result as the coefficient is observed to be positive. Therefore, primary education pushes females towards use of informal services. Lastly, an interaction between trust in formal institutions and high financial numeracy was significant and with a negative effect on the use of informal services.

III-6. CONCLUSIONS, RECOMMENDATIONS AND POLICY OPPORTUNITIES

In our empirical research, we employed a bivariate probit model to investigate the role of (mis)trust in financial institutions in the use of financial services, both formal and informal. The bivariate probit was used because of the significant and positive correlation in unobserved terms that was observed in the two equations, use of formal and informal services respectively. This was the case because individuals could use both services simultaneously. In the data set, 56 percent of the consumers use both types of services simultaneously.

Our research findings suggest that trust in formal and informal financial institutions has a positive effect on an individual's use of a combination of formal and informal services in their bundle. When an individual uses formal services exclusively, trust in formal financial services has a significant and positive effect. On the opposite, trust in informal financial institutions has a negative effect on the exclusive use of formal services. In the same vein, trust in informal institutions has a positive effect on the exclusive use of informal services while trust in formal institutions has a negative effect on such use.

In a scenario where neither formal nor informal services are used, trust in any financial institution (from formal to informal institutions) is established to be significant and with a negative effect. Implying that individuals with trust in any type of financial institution are less likely to be completely excluded from the financial system. Again, this reinforces the relevance of trust in the acceptance and use of financial services.

Comparing the trust variable with others that have been modelled in the current literature, we observe that the variable ranks favourably in influencing use of financial services. The trust variables ranked second from an individual's educational attainment. This result is consistent with the current literature on the significant role of educational status in the use of financial services.

In terms of other variables, we establish that the most vulnerable people in the economy are pushed towards the use of informal financial services or complete exclusion from the financial system. This segment of individuals is observed to be less likely to use a bundle with both formal and informal or one with formal services exclusively. Instead, they are more likely to use informal services exclusively or to be completely excluded from the system.

Assessing the role of financial literacy using two proxies, financial numeracy, and product awareness, we observe that higher attributes in the two proxies push people towards formal services. Further, such attributes push individuals away from exclusive use of informal services and complete financial exclusion. Individuals with medium and high scores in financial product awareness and numeracy respectively are established to be more likely to use a bundle with formal and informal services as well as formal services exclusively, and less likely to use informal services exclusively or be completely excluded.

A dummy for female household heads offers interesting results. It is established that female household heads are more likely to use a bundle with formal and informal services, less likely to use formal services exclusively but more likely to use informal services exclusively compared to their male counterparts. This can be an indication of how they are sceptical of formal services, therefore, not unless they have alternative informal services on the side, they can never rely on formal services alone. Additionally, they are established to be less likely to be excluded from the financial system completely. This can be an indication of the relevance of a certain type of financial service in their life.

When it comes to education, we establish that any form of education from primary to tertiary education has a negative effect on complete exclusion from the financial sector. Further, the three educational statuses included in our estimations are observed to have a positive effect on the use of a bundle with formal and informal services, and in the use of formal services exclusively. However, secondary and tertiary have a negative effect on exclusive of informal services while only primary attainment is observed to have a positive effect on such use.

As established in our work, trust in financial institutions plays a key role in the use of the appropriate types of financial services in the economy. Further, individuals with trust in any financial institution are less likely to be completely excluded from the financial system. Therefore, policymakers, regulators, service providers, and other market players should devise initiatives aimed at improving and sustaining consumer trust in financial services. Further, we established another interesting finding that is useful in efforts of improving financial inclusion as well as the use of services for the already included individuals.

For service providers, ensuring that services provided are of good quality, meet the needs of the consumers and that consumer problems are addressed timely is key in building and sustaining consumer trust in the financial system.

With female household heads established to be more likely to use formal services provided they are complemented by informal services; financial service providers should consider this fact in their design of innovative services. For instance, designing services that are formal but linked to informal services such as informal savings groups might be appropriate in capturing the female household segment. Such a bundle might be beneficial as it would yield improved security, more income (earned through interests), and in the long term integrate them into the formal financial sector.

Further, with financial literacy being identified as key in promoting the use of formal services, providers should engage in financial literacy and related activities in order to improve the levels and thereby use of services. Providers should especially consider this for the low-income and the minority segments who are established to be more likely not to use formal services. There is an incentive for the formal institution to ensure that they expand their outreach as the market is becoming more saturated in most African countries.

Further market research into understanding the dynamics in the use of service in the economy is useful in the provision of appropriate services. This can be done in collaboration with other market players such as development organisations and think tanks who have the resource and interest in advocating for enhanced access to financial services.

With financial literacy and education being observed to have a key role in influencing the use of financial services, financial education initiatives should be scaled up in all regions. For example, a key approach in the delivery of financial education is that of using the school curriculum. With literature establishing that delivery of financial education is effective, it should be highly considered in influencing the use of services as we observe. To improve the current financial education content, we recommend that informal financial services be added to the curriculum. This is so because of the key role that informal services have taken up in the market as demonstrated in literature and reiterated in our work. Informal s. As we established, informal financial services are critical to some segments of the population and their use ensures that individuals are not completely excluded from the financial system.

To ensure that financial education is prioritised and made more sustainable, statutory bodies can make its provision by service providers compulsory or encouraged to be a priority in their corporate social responsibility.

In improving and sustaining trust in the financial sector, consumer protection systems are key in the realisation of this. Therefore, regulatory bodies should ensure building tight regulations such as ensuring that financial dispute resolution processes are effective and fair. This can be done by ensuring that financial service providers have dispute resolution units that are functional. Most financial systems in the SSA region lack such units and consumers rely on the consumer protection body that caters to the entire economy making resolving disputes take a long time.

With the above discussion, development organisations interested in financial inclusion should embark on supplementing market player initiatives in designing appropriate projects to help in building consumer trust. Specifically, the following initiatives can be considered:

Development organisations can supplement financial education efforts by providers and regulators. These organisations are very useful especially to low income and minority populations where they have a huge presence and interactions. Development organisations should try and help in efforts of improving trust in services and financial literacy. Has indicated above, aspects on the informal sector should be incorporated into the curriculum of financial education efforts.

Additionally, with their strong involvement in research, they should help in understanding the financial system by digging deep into some of the areas that our research has established such as investigating further into the actual financial bundle that female households would consider appropriate. Explore further why identifying as a minority group outplays the state of trust in financial services in its use. This investigation would be useful in the design of initiatives in working with these groups.

On a broader view, with other variables such as household income and education being influential in the use of financial services, emphasis should continue being focused on interventions such as economic and social empowerment especially for the marginalised segments in the economy. Access to economic opportunities has an indirect positive effect on trust in overall institutions in the economy, which might, in turn, improve trust and confidence in the use of financial services in the economy by the marginalised. In the same vein, education initiatives especially for the female folk should be encouraged as it was established to influence the use of financial services.

III-Potential Research Areas and Study Limitations

Investigate the role of supply-side (mis)trust in consumers/economic agents on the provision of appropriate financial services. In this research, only the demand-side mis(trust) were considered. This was mainly due to the unavailability of data on the supply side. However, we modelled supply-side explanatory variables to get a glimpse of their influence on consumer (mis)trust and financial service utilisation.

Further, future studies, should consider using 'social capital' and 'trust games' in a further investigation into this phenomenon.

CHAPTER IV

ENABLERS AND BARRIERS TO CONSUMER REALISATION OF IMPROVED FINANCIAL HEALTH FROM FINANCIAL SERVICE USE – EVIDENCE FROM THE KENYAN FINANCIAL SYSTEM

IV-Chapter Abstract

It has been widely established that financial inclusion plays a key role in facilitating economic growth and later job creation and reduction in unemployment levels. With this established nexus, many countries have channelled their concerted efforts on financial inclusion, and rightly so. The Kenyan financial system has been a notable champion and firm believer in financial inclusion in the Sub-Saharan African region. Their commitment has led to notable increases in access to financial services especially for low-income consumers and the marginalised in society. Currently, the majority of adults in the economy have access to a variety of financial services. Despite these high levels of access to services, the latest FinAccess indicates that consumer financial health is very low. It was established that only a fifth of Kenyan adults are in a state of financial health. Against this background, our work aims at investigating enablers and barriers to consumer financial health. If postulated positive impact that comes with financial inclusion at the household level is to be realised, we need to understand the phenomenon of financial health and what drives it. Our work attempts to contribute to the limited if not non-existent literature on this topic. We employ the probit model and benefit from the 2018 Kenya FinAccess Survey.

IV-1.0 BACKGROUND, MOTIVATION AND OBJECTIVES

As highlighted in forgoing thesis chapters, many scholars have postulated the positive impact that financial inclusion has on economic growth and poverty reduction through channels such as facilitating savings, payments, and investments at household and business levels (Demirgüç-Kunt et al., 2015). Therefore, in pursuit of achieving increased job opportunities and alleviation of poverty, world economies have taken financial inclusion seriously as a global agenda.

At the national level, the majority of the countries that are members of the Alliance for Financial Inclusion (AFI) promote broadening access to appropriate financial services among their citizenry (AFI, 2014). Over the years, local and international organisations have heavily invested in this idea of improving financial inclusion (FinAccess, 2009).

Soursourian and Dashi (2015) observe that financial resources channelled to the financial inclusion cause have been increasing over the years. They note that, as of the end of 2014, the funding was estimated to be standing at 31 billion US dollars. On a positive note, there have been substantial targets that have been achieved as agreed upon in the Maya Declaration[37] especially by countries that are a part of the Alliance of Financial Inclusion.

[37] This is a financial inclusion commitment that was launched in 2011 at the Global Policy Forum in Riverian Maya, Mexico. The declaration recognises financial as an important global agenda that has the potential of contributing towards achieving united Nationals Sustainable Development Goals (SDGs) especially Goal 1(poverty alleviation) (AFI, 2014).

Many of these countries have achieved a move on targets such as consolidation of regulatory frameworks, policies on agent banking, consumer protection, mobile financial services, financial integrity as well as financial literacy (AFI, 2014).

Additionally, financial service providers have also been doing their part. For example, they have been innovating financial services delivery channels such as mobile money platforms, agent banking, and microfinance institutions. The main attribute of the delivery channels is that they are easier and cheaper to use, therefore, they attract the poor and marginalised members of the financial system. Further, in addressing barriers of discrimination based on demographic characteristics, Know-Your-Customer requirements have been widely reviewed by many members of the AFI (Aduda & Kalunda 2012).

It has been argued that, over the years, technological advancements have been the major driver of global financial inclusion (Grace et al., 2003; Waverman et al., 2005). Kaffenberger (2014) notes that the Kenyan telecom company, Safaricom has led the growth and revolutionisation of the use of technology since its introduction of the mobile money platform in 2007. The impact of this innovation can be observed in the increase in global financial inclusion numbers from 51 percent in 2011 to 62 percent in 2014 (Demirgüç-Kunt et al., 2015).

IV-1.2 State of Financial Inclusion in Kenya

Kenya is a member of the Alliance for Financial inclusion and was part of the Maya declaration on the financial inclusion agenda, and they have implemented most of the initiatives highlighted in the above section as recommended by the AFI.

As noted in the preceding chapters, the Kenyan financial system has in the past 14 years achieved some key milestones in the expansion of access to financial services. For instance, in the formal financial sub-sector, there has been broadened access to formal banking services across different individual attributes (gender, age, and income). This achievement has been partly attributed to supply-side initiatives of expanding formal service provision and major changes in financial structures and regulation such as the authorisation of agency banking[38] in 2010.

King (2012) established a 46 percent increase in bank branches, from 581 to 849 between the years 2006 and 2009. By 2013, a margin of over 1,314 in the number of branch increase was recorded, translating to a 126 percent increase compared to the year 2006. This increase in the number of branches country-wide has been argued to have reduced the cost of accessing financial services when the cost is calculated using transportation costs to the financial institution (CBK and FSDK, 2015).

[38] The Kenyan Central Bank in May of 2010 issued permission and supporting regulation for agency banking in the financial sector to complement the efforts achieved in physical access to branches.

Apart from increased access to financial services highlighted above, the cost of opening and maintaining a bank account has decreased over the years. This has been attributed to the advancement in financial technology and increased number of suppliers which has led to high competition due to a variety of financial services. The most notable technology here is the use of the mobile platform, which the Kenyan financial system has been leading in. Additionally, with the influence of Equity Bank, banks in Kenya promoted no-frills transaction accounts targeting non-traditional customers, usually the marginalised – low income, women and youth (CBK and FSDK, 2015).

The measures and many others have seen the economy score high levels of financial inclusion. Although more needs to be done especially when it comes to access and use of formal financial services. Villasenor et al. (2015) observe that 75 percent of adult Kenyans can be said to be financially included (have either formal or informal financial service). In the existent literature, Kenya is held in high esteem as they compare favourably globally with 75 percent financial inclusion relative to 44 percent, global average (World Bank 2014).

IV-1.3 Chapter Motivation, Objectives and Contribution

Despite the milestones being witnessed in the financial inclusion sphere, recent literature is casting questions on how much impact it is having on improving the living conditions of ordinary citizens. It is being argued that the country is still experiencing high levels of unemployment especially for the youth, and poverty levels are equally high. The poor and marginalised in the economy have not utilised investment initiatives to enable them to come out of poverty (Balwanz, 2012; KNBS, 2014; the Republic of Kenya, 2013). As indicated above, figures of the aggregate[39] financially included individuals have been improving; 26 percent in 2006, 66.7 percent in 2013, and 75 percent in 2016 (FinAccess, 2006; FinAcess, 2013; Demirgüç-Kunt et al., 2015; FinAcess, 2015). In the same period, individuals living under the poverty line marginally reduced from 47 percent to 42 percent (World Bank, 2014). Additionally, the youth unemployment rate moved up from 12.5 percent to 25 percent between 2006 and 2013 (Mutia, 2014). Other extant literature highlights that Kenya performs relatively poor to other low-income nations in terms of decreasing the levels of unemployment (Mutia, 2014; the Republic of Kenya, 2013b; World Bank, 2014).

The latest FinAccess survey establishes that financial health amongst the Kenyan adult population is still low. In the survey, only a fifth of the adult population was established as being financially healthy. Financial health is very important if the benefits of access and usage of financial services is

[39] Adults with access to either a formal or informal financial service. The figures are lower when disaggregated into formal and informal categories.

to be fully realised in the economy. According to Central Bank Kenya and FSD Kenya (2018) financial health refers to the ability of Kenyans to use financial services for managing daily needs, protecting themselves from shocks, and facilitate the achievement of their main goals in life. It is measured through a multidimensional financial health index covering three dimensions: the ability to '*manage everyday finances*', '*ability to cope with risk*' and '*ability to invest in livelihoods and future*'. This index is the first of its kind, therefore, possesses an interesting opportunity to explore its drivers.

Against this background, this chapter explores the enablers and barriers of consumer financial health in the financial system. Our work enables us to understand the underlining conditions to why financial inclusion is not having an impact on the aspects highlighted above. Specifically, we achieve this through investigating drivers of the state of consumer financial health. In turn, we use factors that were significant in driving recommendations for policy, regulation, and intervention design.

To the best of our knowledge, there is no existing literature that explores drivers of consumer financial health in the financial system. Therefore, our work has great potential of immensely contributing to the building of literature in this area. In the FinAccess survey, they establish the percentage of consumers who can be deemed to be in the state of financial health but do not attempt to explore what drives this state. Therefore, in this chapter, we seek to establish what factors are influential. Further, we want to moderate for other factors and observe how these influencers behave.

Investigating the consumer financial health phenomenon is another way of looking at the impact of financial service use on an individual's welfare. Therefore, it is an important issue to consider. The financial health index incorporates all the main aspects: management of everyday finances, ability to cope with risk, and ability to invest in livelihoods and future. The later component, 'invest in livelihoods and future' has been individually considered in current literature that looks at the impact of financial services on consumer welfare. Therefore, we have the advantage of investigating the phenomenon in a holistic way through the new components being introduced in the financial health index.

Our work has significant policy implications, in that, to improve the impact of financial services on consumers, we need to understand the underlining factors that enable the effective realisation of such a status. This work will inform the design of appropriate policy, regulatory and project interventions by key players in the financial system.

IV- 2.0 LITERATURE REVIEW

The main literature that we seek to build on is that of the Kenya FinAccess 2018. In the survey, an index on financial health was introduced. As defined in the sections above, consumer financial health is defined as the ability of Kenyans to use financial services for managing daily needs, protecting themselves from shocks, and facilitate the achievement of their main goals in life. It is measured through a multidimensional financial health index covering three dimensions: the ability to '*manage everyday finances'*, '*ability to cope with risk'* and '*ability to invest in livelihoods and future'*. The FinAccess survey establishes that only a fifth of the Kenyan population could be deemed to be in a state of financial health (CBK and FSDK, 2018). However, it does not take the next step of empirically investigating the key influencers/drivers of consumer financial health. Therefore, our work seeks to fill this gap.

In the current literature, there is no work that directly looks at drivers of consumer financial health. As defined in the introduction, financial health is one way of looking at the impact of financial services on consumer welfare in a different way. With this in mind, we explore the literature that looks at the impact of financial services on consumers.

Several empirical analyses have been done on financial capability and the use of appropriate investment opportunities in the financial system. These studies have established that a consumer's financial capability has a positive effect on the use of investment initiatives in the financial system. These studies have used different approaches, data, and case studies. They

have all arrived at the general answer aforementioned. Investment is one of the dimensions of consumer financial health.

In Kenya, Ellis et al. (2010) investigated the nexus between financial inclusion and an individual's financial capability. Specifically, the research examines a consumer's borrowing and savings behaviour, why they invest, constraints to financial service access they experience, service type across consumers, and how these are influenced by different individual characteristics. They observe that financial capability has a significant role in an individual's perception and use of financial services mentioned above. They establish that individuals with low financial capabilities were less likely to use and take advantage of the services in improving their welfare.

Further, Githui and Ngare (2014) observe that an individual's financial decision is highly driven by their level of financial capability. The existent literature is consistent on this nexus as many more other studies have concluded the same (Agarwal et al., 2009; Ellis et al., 2009); Lusardi and Mitchell, 2011).

IV- 2.2 Summary of Results Findings

Lastly, in chapter four, we investigate the enablers and barriers to achieving a state of financial health in the Kenyan financial system. The concept of financial health is a different way of looking at the impact of financial service utilisation through the lens of consumer welfare. According to the Kenya Central Bank and FSD Kenya financial health refers to the ability of Kenyans to use financial services for managing daily needs, protecting themselves from shocks, and helping them achieve their main goals in life. In this chapter, we employed a basic probit model in our empirical investigation. The interesting part of the estimation was the use of the new concept, financial health, and new informative variables that we generated. The findings suggest that there exists a positive and significant influence from the following explanatory variables: trust in financial services; household income; identifying in high wealth quintile; being close to a financial service facility; having a life goal that needs finances and being financially literate. On the other hand, the following have a negative significant effect: being from a minority group; a household with a high dependency ratio; identifying as economically most vulnerable, and another household member using mobile money services.

IV-3.0 EMPIRICAL ANALYSIS

IV- 3.1 Data

In our empirical analysis, we employ the Kenya FinAccess Household Survey for 2018. The data under consideration is cross-sectional in nature. The FinAccess, also called FinScope Surveys aims at generating information to help in understanding demand-side dynamics in the financial sector, specifically looking at access to, and utilisation of financial services in the Kenyan market (Central Bank of Kenya and FSD Kenya, 2018).

The FinAccess Household Survey is a nationally representative survey with a sample size of 8,665 respondents (each representing one household). The survey only considers adult (age 18 and above) respondents. The survey is conducted by the Central Bank of Kenya and other major stakeholders in the financial sector. The survey pays great attention to the quality of the data collected. Over the years, methods and techniques have been refined for a better outcome of data collection (Central Bank of Kenya and FSD Kenya, 2018).

IV- 3.2 Model Specification

Our empirical analysis employs a probit model in understanding factors that influence consumer financial health. In an econometric analysis, probit models are usually used to determine the probability that a unit with certain characteristics belongs or does not belong to the category of entities being studied.

In this chapter, the financial health variable is taken as the dependent variable. When an individual is established to be in the state of financial health, it takes 1 and 0 otherwise. Assuming status of an individual's financial health depends on a latent variable y* determined by exogenous variables included in vector X', we have:

$$y_i^* = X_i'\beta + \mu_i \quad (1)$$

$$y_i^* = 1 \ \ s_i y_i' > 0; \ y^* = 0 \ \ s_i y_i^* \leq 0 \quad (2)$$

Subscript i is characteristics of individuals, vector β represents the parameters of the model and μ is the normal distribution error term with mean 0 and variance 1. A critical threshold y_i is assumed, based on which, if y_i^* over y_i then the individual is financial included.

Where Z is the standard normal variable, Z ~ N (0,σ^2) and the cumulative normal distribution function is given by;

$$P_i = P\left(y_i = 1 \middle| X'\right) = P(y_i \leq y_I^*) = P\left(Z_i \leq \beta X_i'\right) = F(\beta X_i') \quad (3)$$

$$\boldsymbol{F = \left(\frac{1}{\sqrt{\pi}}\right) \int_{-\infty}^{\beta X_i'} e^{\frac{z^2}{2}} dt} \quad (4)$$

(Greene, 2012)

IV-3.2.1 Functional model

Equations (5) and (6) below highlight the functional and estimable forms of the probit model under consideration in our empirical analysis.

$$FinHealth_i = \alpha + \beta Trust_i + \gamma x_i + \varepsilon_i \quad (6)$$

Where:

$FinHealth_i$: Denotes the financial health variable

$Trust_i$: Three types of trust in financial institutions; x_i indicates the rest of explanatory variables in our estimation; ε_i is the error term; and α, β and γ are the model parameters.

The two dependent variable is observed as discussed in the above generic bivariate model specification above.

3.3 Variable Description

3.3.1 Dependent Variable

Financial health: According to CBK and FSD Kenya (2018), financial health refers to the ability of Kenyans to use financial services for managing daily needs, protecting themselves from shocks, and in helping them achieve their main goals in life. It is measured through a multidimensional financial health index covering three dimensions: *ability to manage everyday finances*, *ability to cope with risk,* and *ability to invest in livelihoods* and future. Table 1 below summarises the financial health dimensions that were considered.

Table 1: Questions used in Financial Health Index Generation

Ability to invest in livelihoods and the future	Ability to cope with risks	Ability to manage everyday finances
Invest: saving for old age	Risk: kept money aside for future	Manage: never went without food
Invest: money aside for productivity	Risk: could raise lump sum in 3 days	Manage: plan for allocating money
Invest: set money aside for future	Risk: never went without medicine	Manage: no trouble making money last
		Ability to manage day to day

Source: FinAccess survey 2018

In the generation of the index, 11.3 points with an equally weighted score are assigned to nine questions (that capture the three dimensions of financial health) in the FinAccess survey. For each respondent, the scores are summed up, and one is deemed to achieve the state of financial health when they satisfy a minimum of six of the nine questions (they are deemed to have passed the test).

Following the above classification, a dummy variable was generated taking the value of 1 for respondents who achieved the minimum of six marks out of the available nine, and 0 otherwise. Respondents in the '1' category were considered to be in the state of financial health at the time of the survey. Our study considers this dummy as our dependent variable.

3.3.2 Explanatory Variables

Note that most of the variables in this chapter are as defined in the previous two chapters. Therefore, table 2 below offers a summary of these variables.

Table 2: Summary of Independent Variables

Factor or Variable	Variable/Proxy in Regression	Definition/Source/Notes
Trust in financial institutions	- Trust formal - Trust Semi-formal - Trust informal - Has no trust (*base category*)	Dummy variables generated from question "*which financial institution do you trust the most?"* 1 is given for the most trusted financial institution and 0 otherwise. Three categories[40] generated: trust formal, semi-formal and informal financial institution respectively.
Educational status	No education (*base category*)	Dummy for respondents 'without education', with primary and secondary education respectively are generated using question *"highest level of formal education completed"*
	Primary education	
	Secondary education	
	Tertiary education	Dummy for respondents with certificate, diploma, degree, PhD and other higher-level qualification
Economic status	Total household income	This variable was captured from the variable total income.
	Most vulnerable consumers	Using **vulnerability index** from the FinAccess a dummy was generated for most vulnerable respondents
Wealth quintile	Low quintile (base category), Wealth quintile – middle and Wealth quintile - high	

[40] Where formal institutions include commercial banks, insurance companies and, MFIs; semi-formal includes Savings and Credit Associations, banking, and mobile money agents; informal includes informal savings groups, shop lenders, and Rotating Savings and Credit Associations (ROSCAs).

Household characteristics	Rural location, female house head, married head, identify as minority, Household size, Age, Youth respondent,	In this category of variable, we generate dummy variables for each factor accept age and household size which are taken as continuous variables
Proximity to financial institution	Time to financial institution – 10 to 30 minutes	Here we consider proxies of an individual's proximity to financial facilities
	Time to financial institution – under 10 minutes	
	No cost to financial institution	
Exposure and Experience with financial institutions	Household financial decision maker	This category of variables looks at an individual's experience and exposure to financial services. We sought to understand how these experiences and exposure impact on the consumer's financial state.
	Able to cope with risks	
	Another member as, bank account, SACCO account, mobile money account, mobile banking, informal group member	
	Source of financial information – dummy for informal	
	Has access to mobile internet	
	Has a life goal with financial need	
Type of financial service accessed	Formal, semi-formal or informal services	

Sources: Author's own work

3.3 Test for Multicollinearity – VIF

Using the VIF procedure, in this section we test our model for multicollinearity among explanatory variables. The multicollinearity table is represented in Table 10 of chapter three appendix. Due to its influence on the standard errors, the component that determines which of our explanatory variables are significant in our estimation, the presence of multicollinearity is an issue of concern. The following three-step procedure is observed in investigating multicollinearity using the VIF: firstly, generate correlation tables among all the model variables to establish any signs of multicollinearity. Secondly, conduct a regression of explanatory variables, and thereafter, calculate the variance inflation factor (VIF) and the tolerance values. In the VIF, the increase in the variance of estimated coefficients is measured and compared to a situation where correlation is absent among model explanatory variables. There is a general rule of thumb that a VIF score of 5 or higher (or tolerance scores of 5 or less) raises concerns in terms of multicollinearity among explanatory variables (Allison, 2012; Menard, 2002; Menard, 2010).

In our model estimation, we establish VIF values below 4, hence, the model can be considered acceptable (we are confident our results are not inefficient due to collinearity).

3.5 Summary Statistics

Table 3: Summary statistics

Explanatory Variable	Mean	Standard Deviation	Explanatory Variable	Mean	Standard Deviation
Trust in financial institution (base=no trust)			**Type of financial services accessed**		
Trust formal financial institution	0.397	0.489	Formal services	0.338	0.473
Trust semi-formal financial institution	0.339	0.473	Semi-formal institution	0.256	0.436
Trust informal financial institution	0.110	0.313	Informal services	0.106	0.308
Educational status (base=no education)					
Primary education	0.333	0.471	**Financial Health**	0.211	0.377
Secondary education	0.397	0.489	**Household characteristics**		
Tertiary education	0.208	0.406	Rural dweller	0.583	0.493
Economic status			Female household head	0.578	0.494
Total household income	221.6	701.7	Married household head	0.585	0.493
Most vulnerable consumers	0.362	0.481	Minority group	0.276	0.447
Wealth quintile (base=low quintile)			Household size	3.973	2.322
Wealth quintile - Middle	0.187	0.390	Household financial decision-maker	0.498	0.500
Wealth quintile - High	0.339	0.473	Dependency (proxy- number of school children)	1.751	1.823
Proximity to financial institution			Age	39.322	17.050
Time to financial inst. 10-30minutes	0.284	0.451	Youth	0.358	0.480
Time to financial inst. Under 10minutes	0.571	0.495			
No cost to financial institution	0.786	0.410			
Number of observations	**8,623**				

In our summary statistics, we observed that 21 percent of the sampled population had attained the state of financial health (dependent variable). In terms of key explanatory variables (financial institution most trusted), 39.7 percent had trust informal financial services, 33 percent in semi-formal services, and 11 percent in informal financial services. When it comes to the education variable, 33 percent had primary education, 40 secondary, and 20 percent had attained tertiary education. Other explanatory variables are outlined in table 3 above.

3.6 Potential Endogeneity Problem

In our model estimation, there is a potential problem of endogeneity in our (mis)trust explanatory variable. In a regression, if the researcher wants to make causal inferences between the dependent and explanatory variables, the latter needs to be exogeneous, meaning, it should not be driven by the unobserved factors in the estimation. Endogeneity occurs when explanatory variables in the estimation are correlated with the error term (Green, 2012). In our estimation, endogeneity could come from two main sources outlined below.

Firstly, it might be present due to the omission of key explanatory variables (this is called "omitted variable bias") and insufficient sample size. When key variables in the estimation are omitted, this might lead to endogeneity as the predictors will end up being correlated with the error term (Green, 2012). In our case, this might mean that our three "trust" explanatory variables (trust formal, trust semi-formal and trust informal) might be correlated with the error term in the estimation. In our thesis, this source of endogeneity had a very negligible chance of being the source because of the sufficient number of explanatory variables that have been included, and the large sample size that was used in the FinAccess survey 2018 (which used a sample size of 8,623 respondents). In our research, we have included explanatory variables that have already been modelled in the current literature, and new variables, which formed part of our contribution to literature as highlighted in this chapter. Therefore, we have sufficient explanatory variables to avoid the occurrence of endogeneity due to "omitted variable bias". This technique of avoiding endogeneity

due to omitted variables by including sufficient predictors is called 'measure-the-measure' (Hausman, 1983).

Secondly, the other potential source of endogeneity is what is referred as "simultaneity bias". This occurs when the dependent variable is also a predictor of the independent variable and does not just simply respond to it. In our study, there is a chance that our key explanatory variables, financial service most trusted (trust formal, trust semi-formal and trust informal), individuals with goal that require finances, and financial literacy proxy (ability to plan and cope with risk) are influenced by the dependent variable, financial health. Specifically, there is the possibility that those who are financially healthy are more likely to trust financial institutions relative to individuals who are not. Further, those who are financially healthy are more likely to have a goal that requires finances and are more likely to have good financial planning skills and risk coping mechanisms.

The above is a more plausible source of endogeneity in our model compared to the omitted variable bias source discussed in the previous section. However, to solving this source of endogeneity might require the use of an instrumental variable approach. This approach isolates exogenous variations in the explanatory variable of concern (Green, 2012). However, it is generally difficult to find appropriate IVs in many set-ups, and unfortunately, after a hard consideration, our research failed to find an appropriate IV that could be used in ensuring that this potential problem does not affect our results.

Given the above discussion that has demonstrated that we cannot completely rule out the potential problem of endogeneity caused by

"simultaneity bias", our results should be considered to be reflecting correlations and not causality.

IV-4.0 RESULTS AND DISCUSSION

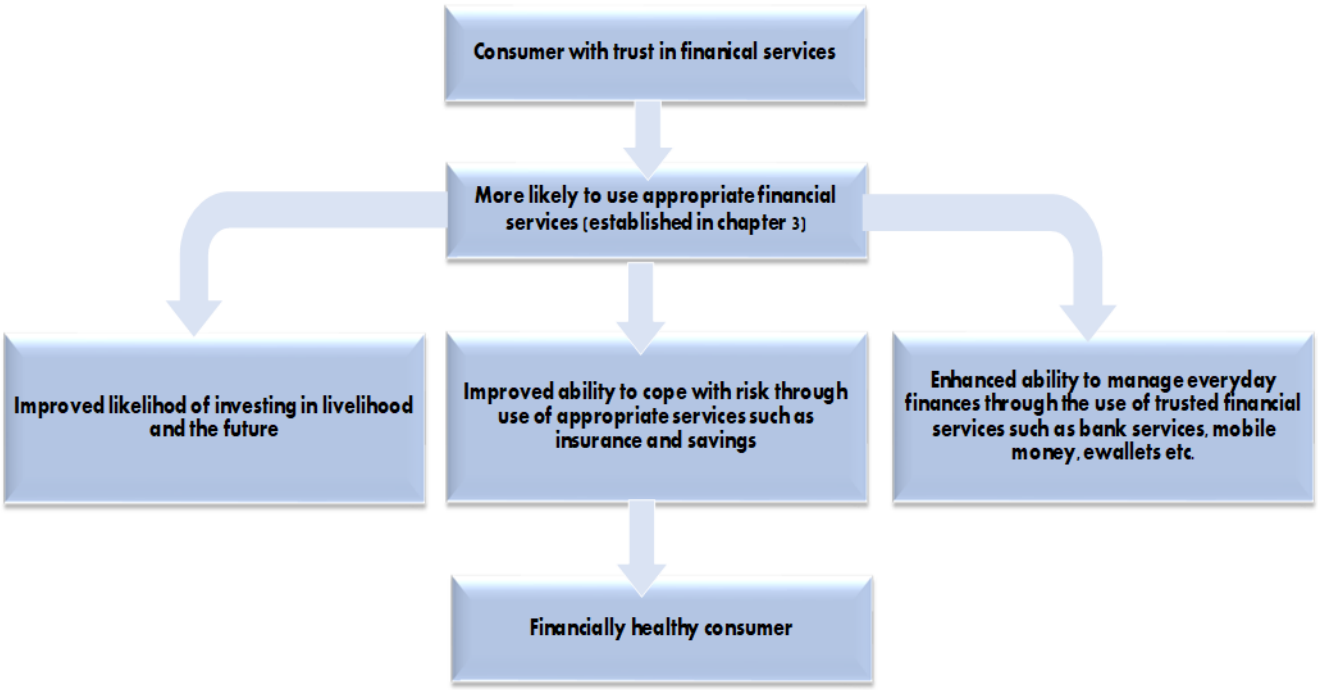
Table 4: Probit Regression Estimations (Marginal Effects)

Probit estimation					
Explanatory variable	**Marginal effect**	**Robust std. error**	**Explanatory variable**	**Marginal Effect**	**Robust std. error**
Trust in financial institution (base=no trust)			**Exposure and experience with fin. Institution**		
Trust formal financial institution	0.045***	0.014	Able to cope with risks	0.232***	0.006
Trust semi-formal financial institution	0.038***	0.014	Another HH member has bank account	0.005	0.008
Trust informal financial institution	0.020	0.016	Another HH member has SACCO account	0.016*	0.008
			Another HH member has mobile money account	-0.029***	0.009
Educational status (base=no education)					
Primary education	-0.017	0.017	Another HH member has mobile banking	0.024***	0.008
			Another HH member has informal group account	-0.011	0.012
Secondary education	-0.018	0.016			
Tertiary education	0.004	0.017	Source of financial information -informal	-0.007	0.006
Economic status			Access mobile internet	0.009	0.007
Total household income	0.036***	0.004	Has life goal that needs finances	0.057***	0.006
Most vulnerable consumers	-0.121***	0.011	**Household characteristics**		
Wealth quintile (base=low quintile)			Rural location	0.006	0.007
Wealth quintile - Middle	0.013	0.010	Female household head	-0.001	0.006
Wealth quintile - High	0.035***	0.009	HH marital status - married	0.012*	0.007
Proximity to financial institution			Minority group	-0.025***	0.008
Time to financial inst. 10-30minutes	0.021*	0.013	Household size	-0.002	0.002
Time to financial inst. Under 10minutes	0.014	0.014	Household financial decision-maker	-0.004	0.007
			Dependency (proxy- number of school children)	-0.006*	0.003
No cost to financial institution	-0.005	0.010			
			Age	0.002*	0.001
Number of observations	8623				
Pseudo R-square	0.522				
Prob> chi-square	0.000				
Wald chi-square x^2(35)	4121.52				

***Significance to 1%; **Significance to 5%; *Significance to 10%

In our estimation, we establish that individuals with trust in formal and semi-formal financial services are more likely to achieve a state of financial health relative to their counterparts without trust. These individuals with trust in the two respective types of financial institutions are established to be more likely to be financially healthy by 4.5 percentage points for formal and 3.8 percentage points for semi-formal institutions. Trust in informal financial institutions is established to be insignificantly related with an individual's state of financial health. Nevertheless, two significant types of trust in financial institutions demonstrate the key role that consumer trust in financial institutions plays in financial service utilisation. This outcome is consistent with what was observed in chapter three of the thesis.

IV - Figure 1: Potential Channels through which Trust affects Consumer Financial Health



Source: Author's own work

As can be seen in figure 1 above, trust in financial services potentially affects consumer health through three main channels. As established in chapter three, trust in financial services is positively associated with the use of appropriate financial services. Given this background, trusting financial services potentially positively contributes to the following three channels: i) Improved likelihood of investing in livelihood and the future ii) Improved ability to cope with risk through the use of appropriate financial services such as insurance and savings, and iii) Enhanced ability to manage everyday finances through the use of trusted financial services such as bank services, mobile money, e-wallets, etc.

Considering the components/variables in Figure 1 are part of the financial health index, the other option of conducting our estimation was through running the analysis on each of the above components as dependent variables. However, this was not feasible as the number of '1s' and '0s' in each of the variables was extremely disproportional to facilitate such direct estimations. Hence, this approach was not considered in our study. Further, considering this index as a whole is extremely important for future studies on this topic, and tracking of the change in the index figures in the next FinAccess survey.

Further, we observe that individuals who are in minority segment of the Kenyan society are 2.5 percentage points less likely to be in a state of financial health compared to their counterparts from majority groups. This dummy was created using language; those that spoke languages outside English and Kiswali are assigned the minority status. This was borrowed from the financial inclusion literature (CBK and FSDK, 2015). This result is

consistent with the wider literature (Cooksey et al., 1994; Kanying, 2006; Ogot, 1995; Ochieng, 1995; Republic of Kenya, 2005) on social and economic marginalisation of minority groups in Kenya and the African continent at large.

Under the economic status category, the following proxies are observed to be significant: total household income, a dummy for most vulnerable, and high wealth quintile. On total household income, we establish that increase in income enhances the likelihood of being in a state of financial health. Further, individuals that are identified as most vulnerable using the PPI[41] index are observed to be less likely to be in a state of financial health by 12.1 percentage points compared to those that are least vulnerable. To triangulate the two proxies, we also used wealth quintiles dummies in the estimations. The high wealth quintile (wealthy segment) was significant and with a positive effect on being financially healthy relative to the low wealth baseline. Individuals in the high wealth quintile are observed to be 3.5 percentage points more likely to be in a state of financial health compared to their counterparts in the low wealth category. Therefore, these three economic status proxies confirm its importance in an individual's likelihood of attaining financial health.

[41] Poverty Probability Index (PPI): A poverty measurement tool designed by Innovation for Poverty Action, which uses 10 questions about a household's characteristics and asset ownership which are scored to compute the likelihood that the household is living below the poverty line.

In the above proxies, we observe that, on average, a consumer with financial resources is highly likely to achieve a state of financial health. Nevertheless, as highlighted in the financial literacy variable in this chapter and in literature (Carpena et al., 2011; CBK and FSD Kenya, 2015), good financial management and decision-making is key in complementing this observed positive impact that financial resources have on a consumer's state of financial health.

In terms of the influence of an individual's proximity to financial facility, we used the approximate time it takes an individual to access a financial institution. Our empirical analysis establishes that those within 10-30minutes (very close to the facility) of reach to financial institutions are more likely to be in a state of financial health by 2.1 percentage points compared to their counterparts above 30 minutes of reach to a financial facility. This result enforces the importance of proximity in the use of financial services as already established in the existent financial inclusion literature (Filipaik, 2015; CBK and FSDK, 2015). Further, this supports financial stakeholder arguments of increasing access in the market, especially in rural areas. This has over the years led to enhanced access to financial services in rural areas (FinAccess, 2015; CBK and FSDK, 2018). In this variable, proximity to the financial facility also refers to semi-formal financial services such as mobile money services which people in rural areas access widely. Therefore, this variable captured both urban and rural dwellers in terms of the effect of proximity on their state of financial health.

The youth are observed to be more likely to be financially healthy relative to older individuals by 1.4 percentage points. A youth was defined as anyone at the age of 30 years old or below. This result is encouraging as the youth are one of the most marginalised segments in most African economies despite being in the majority and critical in the economic growth of these countries.

Further, we establish that individuals that have a goal that needs finances to be realised are more likely to be in a state of financial health in society relative to their counterparts who have goals that do not need finances. The former group was established to be 5.7 percentage points more likely to be in a state of financial health. This result makes sense as those with a goal that needs finances are expected to be more likely to interact with financial service providers and be more financially prudent, relative to their counterparts with no goal that needs finances.

In trying to assess the role that multiple use of financial services within a household might have, we created dummy variables for all the services used in a household, in instances where more than one person had a financial service. The following dummy variables are established to be significant: another household member has a mobile money wallet, mobile banking service, and a SACCO account. For households where another individual has a mobile banking service, we establish that they are more likely to be in a state of financial health by 2.4 percentage points compared to their counterparts without another person with such a service. In the same vein, households with another person with a SACCO account have a positive effect on the state of being financially healthy as

they are established to be 1.6 percentage points relative to those without. On the other hand, those in a household where another individual has a mobile money account are established to be less likely to be in a state of financial health by 2.9 percentage points relative to their counterparts who have no person with another service, and or, have a person with another service apart from a mobile money account.

Additionally, the following control variables are significant: Married individuals are established to be more likely to be financially healthy relative to their single counterparts. Further, dependency levels measured through a proxy of children in the household were established to have a marginal negative effect of 0.06 percentage points in influencing an individual's financial health. Households with higher dependency (number of children) are less likely to be in a state of financial health.

In assessing the impact that financial literacy has on the state of financial health, our empirical estimation used a proxy of the ability to plan and cope with risks. A dummy was generated for all respondents with the ability to plan and cope with risks (unplanned events). We establish that individuals who are financially literate (measured through this proxy) are 23.1 percentage points more likely to achieve the state of financial health relative to their counterparts who are not financially literate.

IV-5.0 CONCLUSIONS, RECOMMENDATIONS AND POLICY IMPLICATIONS

In this last chapter of our thesis, we aimed at investigating the enablers and barriers to achieving a state of financial health in the financial system. The concept of financial health is a different way of looking at the impact of financial service utilisation. It focuses on the effect that financial services have on consumer welfare. This chapter contributes to the emerging literature on techniques of measuring the impact of financial service use. According to the Kenya Central Bank and FSD Kenya financial health refers to the ability of Kenyans to use financial services for managing daily needs, protecting themselves from shocks, and helping them achieve their main goals in life. In this chapter, we employed a basic probit model in our empirical investigation. The interesting part of the estimation was the use of the new concept, financial health, and new informative variables that we generated.

In our empirical analysis, we establish a positive and significant influence from the following explanatory variables: trust in financial services; household income; identifying in high wealth quintile; being close to a financial service facility; having a life goal that needs finances and being financially literate. On the other hand, the following have a negative significant effect: being from a minority group; a household with high dependency ratio; identifying as economically most vulnerable and another household member using mobile money services.

The results of our empirical estimations have implications on possible interventions by financial inclusion stakeholders. In this section, we highlight some of the possible interventions that can be considered.

With the variable trust in financial services being significant in influencing an individual's attainment of financial health, recommendations in chapters 2 and 3 should be considered here too. The results from the three chapters should be used together in consolidating appropriate market intervention. Financial sector stakeholders should seek to enhance consumer trust in financial services through the strengthening of consumer protection platforms, scaling up of financial education activities, and increased research on (mis)trust in financial services and how it moderates consumer behaviour.

In terms of the negative impact that comes from identifying as belonging to a minority group, financial inclusion stakeholders should continue and scale up their activities in poor and highly marginalised communities. There should be a multi-faceted approach as the problems these populations face are diverse. For instance, in the previous chapter, it was established that they are more likely to have mistrust in formal financial services, thereby, negatively influencing their use of these services and ultimately contributing to their poor state of financial health.

Another key outcome is that of the positive effect that comes from a consumer's proximity to a financial service point. This result further confirms what is widely accepted in the general financial inclusion literature, that being close to a financial service point has great benefits.

With this said, stakeholders should promote economic empowerment programmes that enable people to improve their financial resources, education levels, access appropriate financial services, and thereby, attain improved financial health.

Lastly, the establishment of the positive impact that comes with financial literacy on consumer financial health is important in financial policy design and implementation. This result offers further proof of the relevance of an individual's financial literacy levels on the appropriate use of financial services. Therefore, financial education in primary, secondary school curriculum and wider community education initiatives will have a great influence on this result.

IV-Potential Research

- Conduct a similar empirical analysis after some of the recommendations have been put into effect. This would help assess the gains being made on improving the segment of the adult population that is in the state of financial health.
- Replicate this research in other countries like Zambia. This country is conducting its latest survey and has planned to include a section on consumer financial health.

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LIST OF ACRONYMS

Acronyms and key definitions

AfDB: African Development Bank

ASCA: Accumulating Savings and Credit Association

AFI: Alliance for Financial Inclusion

ATM: Automated Teller Machine

CBK: Central Bank of Kenya

EMDE: Emerging Markets and Developing Asia

Formal services: These are financial services used through prudentially regulated service providers and are supervised by independent statutory agencies such as the Central bank of Kenya. Providers in this category include: commercial banks, Microfinance institutions and insurance companies

GDP: Gross Domestic Product

FSDK: Financial Sector Deepening Kenya

Informal services: Financial services offered by providers that are not regulated, but with a relatively well-defined organisational structures such as governing constitution and leadership

IMF: International Monetary Fund

IIA: Independence of Irrelevant Alternatives

Ksh: Kenyan Shilling

LIC: Low-income Countries

LAC: Latin America and the Caribbean

Merry-go-round: A group in which members contribute a fixed amount for a fixed duration, and each member is paid the entirety of the collected money on a rotating schedule

MENA: Middle East and North region

MFI: Microfinance institution

Mobile phone banking: Mobile phone–based banking services by commercial banks such as Timiza, HF Whizz, M-Coop Cash, M-Shwari, Eazzy loan, and T-Kash.

Poverty Probability Index (PPI): A poverty measurement tool designed by Innovation for Poverty Action, which uses 10 questions about a household's characteristics and asset ownership which are scored to compute the likelihood that the household is living below the poverty line.

RCT: Randomised Control Trial

ROSCA: Rotating and Savings Credit Associations

SACCO: Savings and Credit Co-operative

SSA: Sub-Saharan African

VIF: Variance inflation factor

Wealth quintile: In the FinAccess survey, using household assets, an affluence score is assigned. The population is equally divided into groups

(quintiles) and each respondent is placed in their corresponding quintile based on the level of affluence/social strata.

THESIS APPENDIX

CHAPTER I APPENDIX

I-Appendix 1: The state of the Banking Sector in SSA

Year	2012	2013	2014	2015	2016	2017
Commercial bank branches (per 100 000 adults)	3.7	3.8	4.2	4.9	5.3	.
Brower from commercial banks (per 100 000 adults)	21.5	23.3	34.2	34.7	.	.
Depositors with commercial banks (per 100 000 adults)	206.9	245.0	242.6	292.1	.	.
Domestic credit to private sector by banks (% of GDP)	29.3	27.9	27.7	28.8	28.9	31.8
Firms using banks to finance investment (% of firms)	.	.	.	.	.	22.9

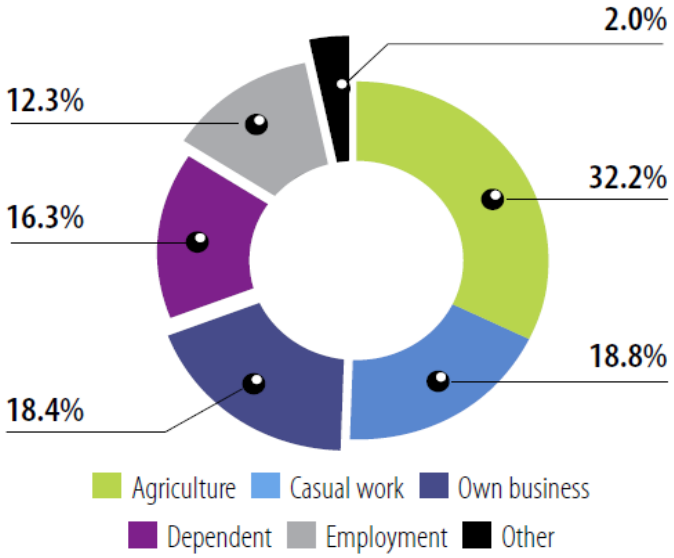
Source: World Bank, Development Indicators

I – Appendix 2: Financial Services Definition

Financial Service Classification	Definition	Service Provider Type/Example(s)
Formal	Financial services used through prudentially regulated service providers and are supervised by independent statutory agencies (CBK, CMA, IRA, RBA and SASRA).	- Commercial banks (includes mobile bank accounts - Microfinance Institutions - Capital market intermediaries - Insurance service providers
Semi-formal services	Financial services through service providers that are subject to non-prudential oversight by government departments/ministries with focused legislations or statutory agencies.	- Mobile money services such as M-PESA - Postbank - National Health Insurance
Informal services	Financial services through forms not subject to regulation, but have a relatively well-defined organizational structure.	- Groups such as Accumulating Savings and Credit Association (ASCAs) and Rotating Savings and Credit Associations (ROSCAs) - Shopkeepers/ sully chain credit - Money lenders/shylocks
Excluded segment	Individuals who report using financial services only through family, friends, neighbours or keep in secret places.	- Social networks and individual arrangements (e.g., secret hiding place)

CHAPTER II APPENDIX

III-Appendix 1: Main Source of Livelihood



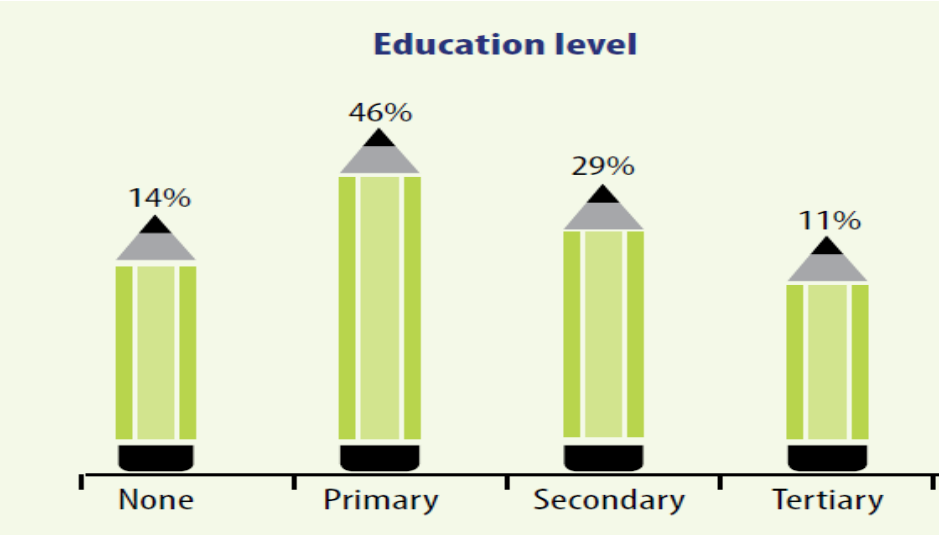
Source: FinAccess 2016 Survey

II-Appendix 2: Average Monthly Income per Individual (%)

Income group	%	N
KSh 0 -1,500	13.2	2,722,393
KSh 1,501 - 3,000	15.0	3,111,800
KSh 3,001 - 7,500	25.0	5,187,860
KSh 7,501 - 15,000	22.2	4,617,787
KSh 15,001 - 30,000	14.9	3,083,724
KSh 30,001 -100,000	8.4	1,747,622
Over KSh 100,000	1.4	290,320
Total	**100.0**	**20,761,505**

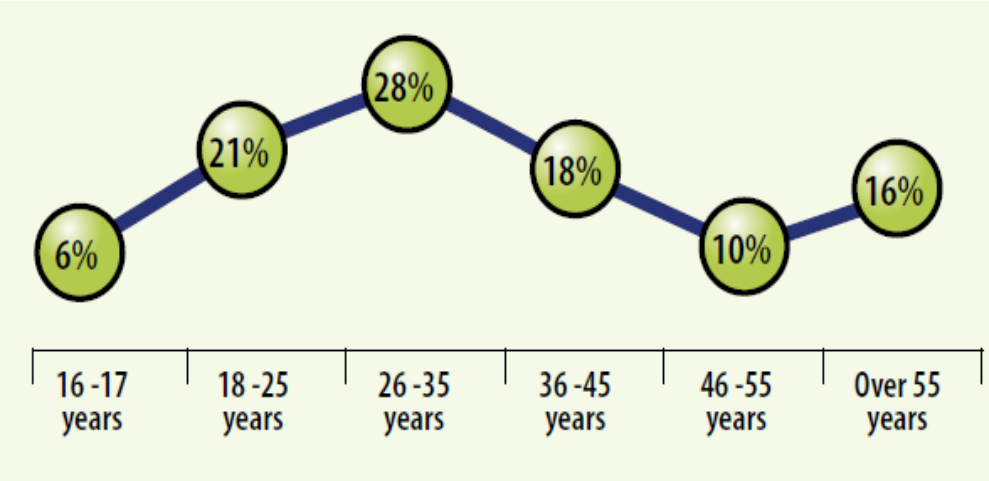
Source: FinAccess 2016 Survey

II-Appendix 3: Education levels



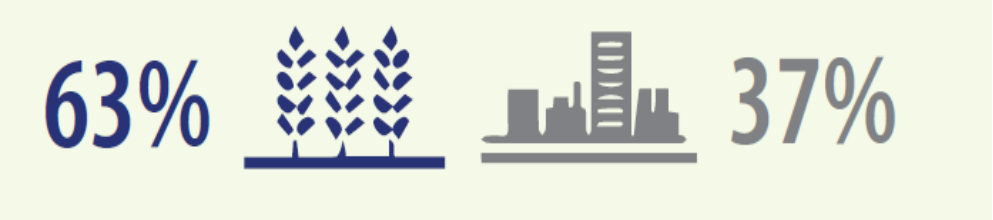
Source: FinAccess 2016 Survey

II-Appendix 4: Age Distribution



Source: FinAccess 2016 Survey

II-Appendix 5: Rural vs Urban Distribution



Source: FinAccess 2016 Survey

Appendix 6: Summary variable description

Factor or Variable	Variable/Proxy in Regression	Definition/Source/Notes
Financial literacy	Financial numeracy - High - Medium - Low (*base category*)	Dummy variables generated from the Numeracy Score Index (NSI) in the FinAccess survey. The NSI has two questions (**c1** and **c2**) with the following rank: 0=no correct answer, 1=one correct answer and 2= two correct answer. The three numeracy dummy variables are generated for high=2 index rank, medium=1 index rank and low=0 index rank.
	Financial product awareness - High - Medium - Low (*base category*)	Similar to the numeracy index, the financial product awareness index is used in generating dummy variables. Here, the index was created from question **b2_1** of the FinAccess survey. The question looks at product awareness of respondents. Depending on the products respondents are aware of, they are ranked from 0=none, 1=half of the products and 2=all of them. Dummy variables capturing low, medium and high awareness are generated from the above index.
Educational status	No education (*base category*)	Dummy for respondents 'without education', with primary and secondary education respectively are generated using question **a_14** *"highest level of formal education"*
	Primary education	
	Secondary education	
	Tertiary education	Dummy for respondents with certificate, diploma, degree, PhD and other higher-level qualification generated using question **a_14** *"highest level of formal education"*
Experience with financial services/institutions	Source of financial information	Generated from question **b8** *"who do you depend on for financial advice"* The sources were categorised into two, formal and informal sources. A dummy for formal sources was generated (1=formal & 0=otherwise).
	Experienced financial scam	Using question **b7_1** "*Have you ever lost money in a financial scheme?*" a dummy variable was generated (1=yes & 0=otherwise).

	Experienced unfair financial treatment	This variable only considered respondents with access to accounts. Captured from question **e22_1_1** "why did you close your bank account? All responses with unfair treatment were grouped together and a dummy (unfair treatment reason=1 and otherwise) generated
Type of financial institution close to	Formal institution	Generated from question **q1** *"which is the nearest financial /service provider from where you live?"* The responses were grouped into formal, semi-formal and informal financial institutions, and a dummy variable generated for each of the aforementioned category.
	Semi-formal institution	
	Informal institution	
Household dynamics	Household head	Dummy generated from **q_gender_of_household_head**: 1=female and 0=otherwise
	Household financial decision-maker	Dummy generated from b1_1[42]: 1=yes and 0=otherwise
	Vulnerability	Using **vulnerability index** from the FinAccess a dummy is generated for most vulnerable respondents
	Household size	Continuous variable captured from question **a_7_1** *"household size"*
	Total household income	Continuous variable captured from variable **total_income**
	Someone else has an account in the household	Dummy (1=yes and 0=otherwise) generated from question **e24**
Kenyan regions	Nairobi, Nyanza, Rift Valley, Eastern, North Eastern, Western, Coast and Central	Dummy variable generated from variable **sub_region** "Kenyan sub regions"
Other variables	Age	Continuous variable captured from variable **age**
	Minority group	Dummy generated respondents who speak minority languages (1=yes and 0=otherwise) captured from variable **Language_Status**
	Location-rural	Dummy variable generated from the question **"cluster type"**
	Marital status	Dummy variable for single respondents generated using variable **MaritalS**

[42] *Who makes the main decisions about how money is spent in this household?*

	Youth	Using the **age** variable, a dummy is generated for age under 30 years
	Religion	Using the variable **religion,** a dummy variable for Christian was generated

Appendix 7: Variance Inflation Factor – Test for Multicollinerity

Explanatory Variable	**VIF**	**1/VIF**	**Explanatory Variable**	**VIF**	**1/VIF**
Financial numeracy – High	1.24	0.804	**Kenyan regions**		
Financial numeracy – medium	1.05	0.952	Nairobi	1.82	0.548
Financial product awareness – high	2.14	0.468	Nyanza	3.01	0.332
Financial product awareness – medium	1.66	0.602	Rift valley	3.43	0.291
Educational status (base=no education)			Eastern	2.52	0.396
Primary education	3.07	0.325	North Eastern	2.44	0.410
Secondary education	3.60	0.278	Western	2.04	0.491
Tertiary education	2.53	0.396	Coast	2.46	0.407
Experience with financial services			Central	2.23	0.448
Source of financial information -formal	1.10	0.905	**Other Variables**		
Experienced financial scam	1.04	0.966	Age	2.42	0.414
Experienced unfair financial treatment	1.07	0.936	Minority group	1.81	0.551
Type of financial institution close to			Location – rural	1.28	0.784
Formal institution	1.74	0.575	Marital status – single	1.53	0.653
Semi-formal institution	2.74	0.365	Youth	2.26	0.442
Informal institution	1.91	0.522	Religion – Christian	1.86	0.537
Household dynamics					
Female household head	1.40	0.715			
Household financial decision-maker	1.35	0.739			
Vulnerability index-most vulnerable	1.21	0.830			
Household size	1.32	0.760			
Total household income	1.46	0.687			
Another household member has account	1.14	0.875	**Mean VIF**	**1.94**	

CHAPTER III APPENDIX

III-Appendix 1: Bivariate probit and probit estimation with coefficients

Probit and bivariate probit results, coefficients

	Probit (with coefficients)		Biprobit (with coefficients)	
Explanatory Variable	**Use of formal**	**Use of informal**	**Formal**	**Informal**
Trust in financial institution (base=no trust)				
Trust formal financial institution	0.585(0.057)***	0.335 (0.045)***	0.580(0.056)***	0.334(0.045)***
Trust semi-formal financial institution	0.367(0.057)***	0.336(0.045)***	0.366(0.057)***	0.335(0.045)***
Trust informal financial institution	0.224(0.085)***	0.839(0.066)***	0.220(0.085)**	0.839(0.066)***
Financial literacy (base=low numeracy and awareness)				
Financial numeracy - high	0.297(0.045)***	0.028(0.041)	0.300(0.045)***	0.029(0.041)
Financial numeracy - medium	0.161(0.041)***	0.003(0.036)	0.165(0.041)***	0.004(0.036)
Financial product awareness - high	0.640(0.050)***	0.207(0.046)	0.640(0.050)***	0.206(0.046)***
Financial product awareness - medium	0.357(0.044)***	0.240(0.038)***	0.357(0.044)***	0.240(0.038)***
Educational status (base=no education)				
Primary education	0.294(0.061)***	0.367(0.038)***	0.284(0.061)***	0.366(0.048)***
Secondary education	0.603(0.070)***	0.319(0.059)***	0.591(0.069)***	0.317(0.059)***
Tertiary education	1.268(0.094)***	0.263(0.075)***	1.256(0.094)***	0.263(0.075)***
Experience with financial services				
Source of financial information -informal	0.335(0.058)***	0.008(0.049)	0.335(0.058)***	0.007(0.049)
Type of financial institution close to (base=informal)				
Formal institution	0.168(0.084)**	-0.332(0.070)***	0.168(0.084)**	-0.334(0.070)***
Semi-formal institution	0.044(0.050)	-0.192(0.040)***	0.048(0.050)	-0.193(0.040)***
Household dynamics				
Female household head	0.120(0.045)***	0.447(0.038)***	0.114(0.045)**	0.448(0.039)***
Household financial decision-maker	0.201(0.037)***	-0.053(0.032)*	0.207(0.037)***	-0.053(0.032)*
Vulnerability index-most vulnerable	-0.033(0.009)***	0.053(0.031)*	-0.130(0.035)***	0.053(0.031)*
Household size	-0.022(0.007)***	0.004(0.006)	-0.022(0.007)***	0.004(0.006)
Total household income	0.313(0.016)***	0.125(0.013)***	0.314(0.016)***	0.126(0.013)***
Other Variables				
Age	0.012(0.001)***	0.003(0.001)***	0.012(0.001)***	0.003(0.001)***
Minority group	-0.175(0.044)***	0.135(0.037)***	-0.173(0.044)***	0.135(0.037)***
Location - rural	-0.239(0.035)***	0.081(0.031)***	-0.244(0.035)***	0.079(0.031)**
Marital status - single	-0.181(0.042)***	-0.5230(0.036)***	-0.181(0.042)***	-0.523(0.036)***
Constant	-4.613(0.179)***	-1.890(0.137)***	-4.615(0.179)***	-1.889(0.137)***
Number of observations	**8,488**			
Wald chi-square χ^2 (44)	**3063.38**			
Prob > chi-square	**0.000**			

***Significance to 1%; **Significance to 5%; *Significance to 10%

Note: robust standard error figures in parenthesis with marginal effects in front

III-Appendix 2: Correlation tables

	Trust formal institutions	Trust semi-formal inst	Trust informal institution	High fin. Numeracy	Medium fin. Literacy	High fin. Product awareness	Medium fin. Product awareness	Primary education	Secondary education	Tertially education	Source of fin. Info-formal	Close formal institution	Close sem-formal institution
Trust formal institutions	1.000												
Trust semi-formal inst	-0.580	1.000											
Trust informal inst	-0.213	-0.187	1.000										
High fin. Numeracy	0.147	0.020	-0.074	1.000									
Medium fin. Literacy	0.056	0.045	-0.005	-0.433	1.000								
High fin. Product awareness	0.175	0.050	-0.087	0.282	0.032	1.000							
Medium fin. Product awareness	0.088	0.040	0.005	0.007	0.103	-0.465	1.000						
Primary education	-0.062	0.084	0.073	-0.192	0.065	-0.218	0.144	1.000					
Secondary education	0.148	0.056	-0.081	0.204	0.073	0.203	0.124	-0.558	1.000				
Tertially education	0.141	0.006	-0.069	0.247	-0.012	0.386	-0.137	-0.291	-0.201	1.000			
Source of fin. Info-formal	0.098	0.012	-0.036	0.158	-0.008	0.195	-0.042	-0.087	0.047	0.182	1.000		
Close formal institution	0.103	-0.064	-0.037	0.021	0.028	0.046	-0.018	-0.061	0.014	0.075	0.059	1.000	
Close sem-formal institution	0.038	0.103	0.000	0.058	0.033	0.086	0.074	0.060	0.075	0.041	0.017	-0.473	1.000

III-Appendix 2: Correlation tables Continues

	Trust formal institutions	Trust semi-formal inst	Trust informal institution	High fin. Numeracy	Medium fin. Literacy	High fin. Product awareness	Medium fin. Product awareness	Primary education
Female Household Head	-0.053	-0.031	0.031	-0.044	-0.070	-0.084	-0.009	-0.044
Financial decision maker	-0.028	-0.016	0.010	-0.017	-0.012	0.002	-0.016	0.031
Most vulnerable	-0.121	-0.048	0.043	-0.175	-0.027	-0.167	-0.033	0.060
Household size	-0.036	-0.028	0.041	-0.057	0.012	-0.135	0.001	0.071
Total HH income	0.155	0.038	-0.070	0.193	0.068	0.334	-0.035	-0.119
Age	-0.082	-0.097	0.042	-0.121	-0.094	-0.058	-0.079	-0.006
Minority group	-0.092	-0.087	0.083	-0.081	-0.038	-0.194	-0.033	-0.016
Location-Rural	-0.136	-0.012	0.067	-0.120	-0.050	-0.210	-0.026	0.092
Marital status-single	0.026	-0.018	-0.027	0.059	-0.044	0.001	0.004	-0.087

	Age	Minority group	Location-Rural	Marital status-single
Age	1.000			
Minority group	0.153	1.000		
Location-Rural	0.147	0.132	1.000	
Marital status-single	-0.087	-0.019	-0.069	1.000

III-Appendix 2: Correlation tables Continues

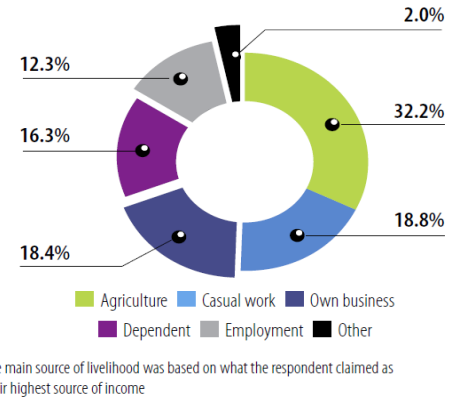
	Secondary education	Tertially education	Source of fin. Info-formal	Close formal institution	Close sem-formal institution	Female Household Head	Financial decision maker	Most vulnerable	Household size	Total HH income
Female Household Head	-0.033	-0.034	-0.052	0.010	-0.021	1.000				
Financial decision maker	-0.110	-0.013	0.041	0.002	0.007	0.210	1.000			
Most vulnerable	-0.154	-0.156	-0.091	-0.013	-0.083	0.069	0.058	1.000		
Household size	-0.091	-0.127	-0.039	0.010	-0.074	-0.126	-0.260	0.176	1.000	
Total HH income	0.066	0.313	0.171	0.062	0.065	-0.157	0.112	-0.210	-0.100	1.000
Age	-0.209	-0.074	0.026	-0.006	-0.063	0.106	0.316	0.084	-0.111	-0.027
Minority group	-0.163	-0.138	-0.058	-0.001	-0.138	0.091	0.017	0.116	0.108	-0.122
Location-Rural	-0.155	-0.171	-0.051	-0.110	-0.046	-0.013	-0.002	0.138	0.204	-0.199
Marital status-single	0.093	0.025	-0.042	0.012	0.035	0.475	0.151	-0.008	-0.195	-0.198

III-Appendix 4: Variable interaction tables

III-5.1 Sex, Location, Education and Age distribution

Variable	**Percentage distribution**				
Sex	Male (48%)	Female (52%)	N/A	N/A	
Location	Rural (63%)	Urban (37%)	N/A	N/A	
Education	None (14%)	Primary (46%)	Secondary (29%)	Tertiary (11%)	
Age	16-17 (6%)	18-25 (21%)	26-35 (18%)	46-55 (10%)	Over 55 (16%)

III-5.2 Main source of income and Average monthly income per individual (%)



* The main source of livelihood was based on what the respondent claimed as their highest source of income

Income group	%	N
KSh 0 -1,500	13.2	2,722,393
KSh 1,501 - 3,000	15.0	3,111,800
KSh 3,001 - 7,500	25.0	5,187,860
KSh 7,501 - 15,000	22.2	4,617,787
KSh 15,001 - 30,000	14.9	3,083,724
KSh 30,001 -100,000	8.4	1,747,622
Over KSh 100,000	1.4	290,320
Total	**100.0**	**20,761,505**

Source: FinAccess 2016 survey

III-Appendix 6: Wald Test of Joint Significance

Model fit- Wald test

(1) [Access formal services]Trust formal Institutions = 0

(2) [Access informal services]Trust formal Institutions = 0

(3) [formal_prudential]TrustsemiformalInst = 0

(4) [Access informal services]TrustsemiformalInst = 0

(5) [Access formal services]TrustinformalInst = 0

(6) [informal]TrustinformalInst = 0

(7) [Access formal services]high fin. numeracy = 0

(8) [Access informal services]high fin. numeracy = 0

(9) [Access formal services]medium fin. numeracy = 0

(10) [Access informal services]medium fin. numeracy = 0

(11) [formal_prudential]high fin. product awareness= 0

(23) [Access formal services]Formal fin.proximity = 0

(24) [Access informal services]Formal fin. proximity = 0

(25) [Access formal services]Semiformal fin proximity = 0

(26) [Access informal services]Semiformal fin. proximity = 0

(27) [Access formal services]Female household head = 0

(28) [Access informal services]Female household head = 0

(29) [Access formal services]Household decision maker = 0

(30) [Access informal services]Household decision maker = 0

(31) [Access formal services]Most vulnerable= 0

(32) [Access informal services]Most vulnerable = 0

(33) [Access formal services]Househld size = 0

chi2(44) = 3063.38
Prob > chi2 = 0.0000

III-Appendix 6: Wald Test of Joint Significance continues

Model fit- **Wald test**	
(12) [Access informal services]high fin. product awareness = 0	(34) [Access informal services]Househld size = 0
(13) [Access formal services]medium fin. product awareness= 0	(35) [Access formal services]lTotal HH income = 0
(14) [Access informal services]medium fin. product awareness= 0	(36) [Access informal services]lTotal HH income = 0
(15) [Access formal services]Primary education = 0	(37) [Access formal servicesl]Age = 0
(16) [Access informal services]Primary education = 0	(38) [Access informal services]Age = 0
(17) [Access formal services]Secondary education = 0	(39) [Access formal services]Minority Group = 0
(18) [Access informal services]Secondary education = 0	(40) [Access informal services]Minority Group = 0
(19) [Access formal services]Tertiary education = 0	(41) [Access formal services]Rural location = 0
(20) [Access informal services]Tertiary education = 0	(42) [Access informal services]Rural location = 0
(21) [Access formal services]Source fin. information = 0	(43) [Access formal services]Marital_Single = 0
(22) [Access informal services]Source fin. linformation = 0	(44) [Access informal services]Marital_Single = 0
chi2(44) = 3063.38	
Prob > chi2 = 0.0000	

III-Appendix 7: Univariate Probit Estimation

Probit and bivariate probit results, marginal effects

	Probit	
Explanatory Variable	**Use of formal**	**Use of informal**
Trust in financial institution (base=no trust)		
Trust formal financial institution	0.148(0014)***	0.122 (0.016)***
Trust semi-formal financial institution	0.093(0.014)***	0.122(0.016)***
Trust informal financial institution	0.057(0.021)***	0.305(0.023)***
Financial literacy (base=low numeracy and awareness)		
Financial numeracy - high	0.075(0.011)***	0.010(0.015)
Financial numeracy - medium	0.041(0.010)***	0.001(0.013)
Financial product awareness - high	0.162(0.012)***	0.075(0.017)***
Financial product awareness - medium	0.090(0.011)***	0.087(0.014)***
Educational status (base=no education)		
Primary education	0.074(0.015)***	0.133(0.017)***
Secondary education	0.152(0.017)***	0.116(0.021)***
Tertiary education	0.321(0.023)***	0.096(0.027)***
Experience with financial services		
Source of financial information -informal	0.085(0.015)***	0.003(0.018)
Type of financial institution close to (base=informal)		
Formal institution	0.043(0.021)**	-0.121(0.025)***
Semi-formal institution	0.011(0.013)	-0.070(0.015)***
Household dynamics		
Female household head	0.030(0.011)***	0.163(0.014)***
Household financial decision-maker	0.051(0.009)***	-0.019(0.012)*
Vulnerability index-most vulnerable	-0.033(0.009)	0.019(0.011)*
Household size	-0.006(0.002)	0.001(0.002)
Total household income	0.079(0.004)***	0.046(0.005)***
Other Variables		
Age	0.003(0.000)***	0.001(0.000)***
Minority group	-0.044(0.011)***	0.049(0.013)***
Location - rural	-0.060(0.009)***	0.029(0.011)***
Marital status - single	-0.046(0.011)***	-0.190(0.012)***
Number of observations	**8,488**	
Rho(ρ)	**0.208*** **	
Wald chi-square χ^2 (44)	**3063.38**	
Prob > chi-square	**0.000**	

***Significance to 1%; **Significance to 5%; *Significance to 10%

Note: robust standard error figures in parenthesis with marginal effects in front

III - Appendix 8: Summary Variable Description

Factor or Variable	Variable/Proxy in Regression	Definition/Source/Notes

Trust in financial institutions	- Has trust in formal - Has trust in Semi-formal - Has trust in informal - Has no trust (*base category*)	Dummy variables generated from question **b9_1** "*which financial institution do you trust the most?"* 1 is given for the most trusted financial institution and 0 otherwise. Three categories[43] generated: trust formal, semi-formal and informal financial institution respectively.
Financial literacy	Financial numeracy - High - Medium - Low (*base category*)	Dummy variables generated from the Numeracy Score Index (NSI) in the FinAccess survey. The NSI has two questions (**c1** and **c2**) with the following rank: 0=no correct answer, 1=one correct answer and 2= two correct answer. The three numeracy dummy variables are generated for high=2 index rank, medium=1 index rank and low=0 index rank.
	Financial product awareness - High - Medium - Low (*base category*)	Similar to the numeracy index, the financial product awareness index is used in generating dummy variables. Here, the index was created from question **b2_1** of the FinAccess survey. The question looks at product awareness of respondents. Depending on the products respondents are aware of, they are ranked from 0=none, 1=half of the products and 2=all of them. Dummy variables capturing low, medium and high awareness are generated from the above index.

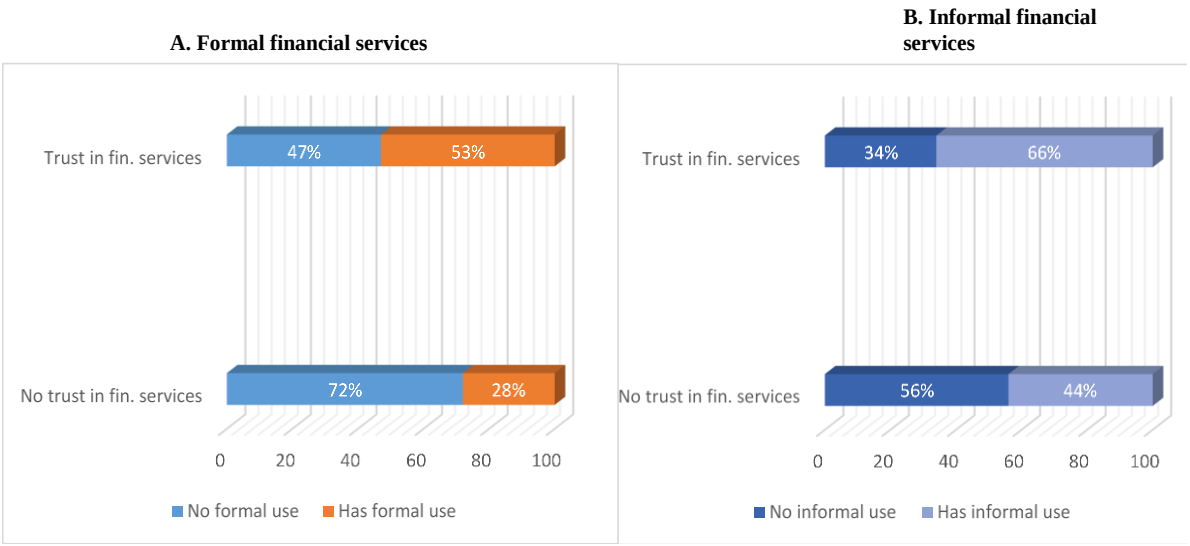
[43] Were formal institutions include commercial banks, insurance companies and MFIs; semi-formal includes Savings and Credit Associations, banking and mobile money agents; informal includes informal savings groups, shop lenders and Rotating Savings and Credit Associations (ROSCAs).

Educational status	No education (*base category*)	Dummy for respondents 'without education', with primary and secondary education respectively are generated using question **a_14** *"highest level of formal education"*
	Primary education	
	Secondary education	
	Tertiary education	Dummy for respondents with certificate, diploma, degree, PhD and other higher-level qualification generated using question **a_14** *"highest level of formal education"*
Experience with financial services/institutions	Source of financial information	Generated from question **b8** *"who do you depend on for financial advice"* The sources were categorised into two, formal and informal sources. A dummy for formal sources was generated (1=formal & 0=otherwise).
Type of financial institution close to	Formal institution	Generated from question **q1** *"which is the nearest financial /service provider from where you live?"* The responses were grouped into formal, semi-formal and informal financial institutions, and a dummy variable generated for each of the aforementioned category.
	Semi-formal institution	
	Informal institution (*base category*)	
	Female household head	Dummy generated from **q_gender_of_household_head**: 1=female and 0=otherwise
	Household financial decision-maker	Dummy generated from b1_1[44]: 1=yes and 0=otherwise
	Vulnerability	Using **vulnerability index** from the FinAccess a dummy was generated for most vulnerable respondents

[44] Who makes the main decisions about how money is spent in this household?

Household dynamics	Household size	Continuous variable captured from question **a_7_1** *"household size"*
	Total household income	Continuous variable captured from variable **total_income**
	Someone else has an account in the household	Dummy (1=yes and 0=otherwise) generated from question **e24**
Other variables	Age	Continuous variable captured from variable **age**
	Minority group	Dummy generated respondents who speak minority languages (1=yes and 0=otherwise) captured from variable **Language_Status**
	Location-rural	Dummy variable generated from the question **"cluster type"**
	Marital status	Dummy variable for single respondents generated using variable **MaritalS**
	Youth	Using the **age** variable, a dummy is generated for age under 30 years

III - Appendix 9: Mis(trust) in Financial Services vs Formal Use/Non-use



Appendix 10: Test for Multi-collinearity – VIF

Variance Inflation Test

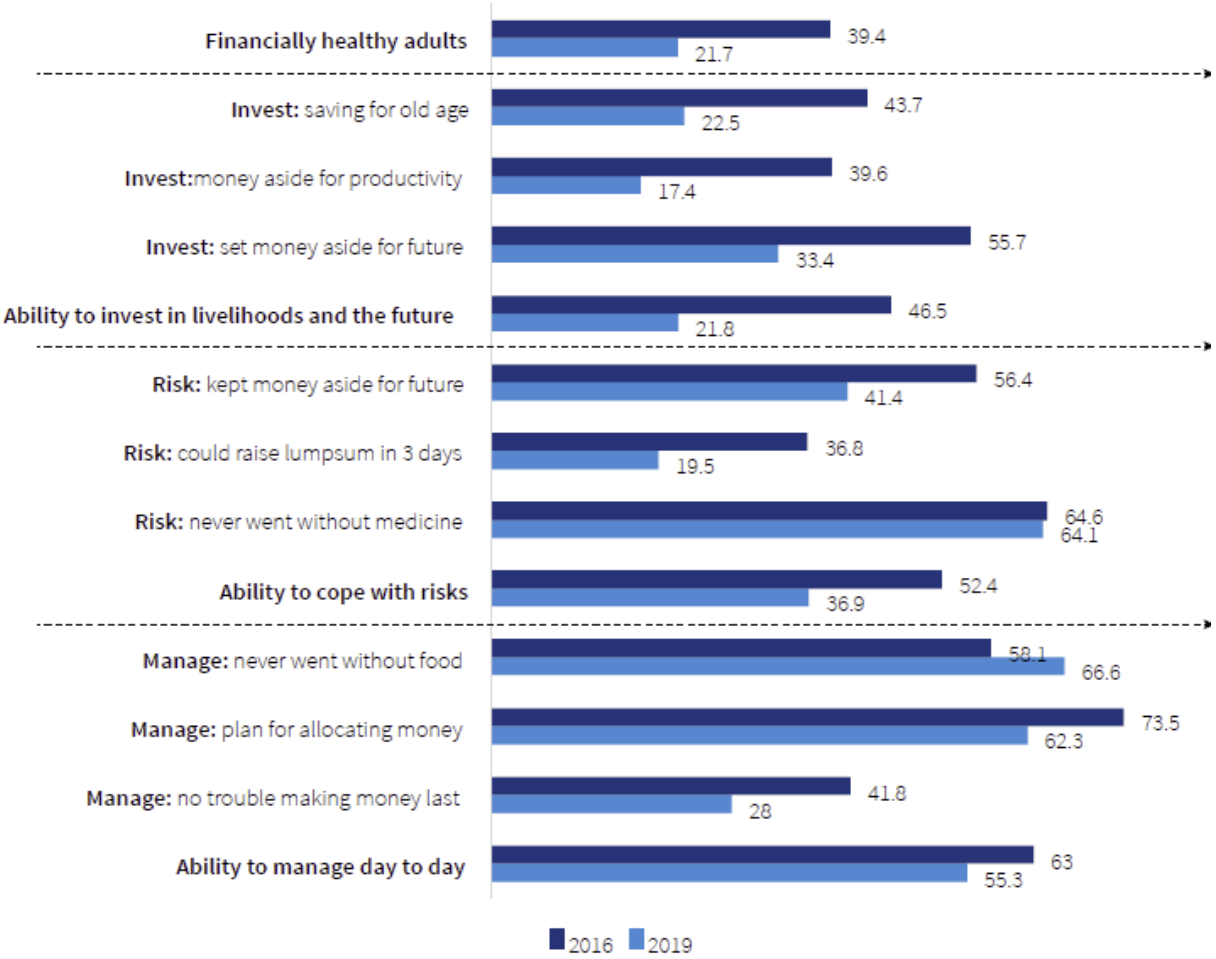
Explanatory Variable	VIF	1/VIF	Explanatory Variable	VIF	1/VIF
Trust in financial services (base=no trust)			**Other Variables**		
Trust formal services	1.16	0.862	Age	1.32	0.756
Trust semi-formal services	1.08	0.923	Minority group	1.17	0.856
Trust informal services	1.06	0.943	Location - rural	1.17	0.852
Educational status (base=no education)			Marital status - single	1.46	0.684
Primary education	2.59	0.386			
Secondary education	3.24	0.309			
Tertiary education	2.37	0.422			
Financial Literacy (base=low literacy)					
Financial numeracy - High	1.67	0.598			
Financial numeracy - medium	1.44	0.693			
Financial product awareness - high	2.17	0.462			
Financial product awareness - medium	1.67	0.600			
Experience with financial services					
Source of financial information -formal	1.08	0.923			
Type of financial institution close to					
Formal institution	1.36	0.737			
Semi-formal institution	1.39	0.719			
Household dynamics					
Female household head	1.38	0.722			
Household financial decision-maker	1.29	0.777			
Vulnerability index-most vulnerable	1.15	0.869			
Household size	1.24	0.808			
Total household income	1.46	0.687			
				Mean VIF	**1.538**

Appendix 11: Variable interaction

Variables and Interactions (Use formal services)	Marginal Effects	Robust Standard Errors	Variables and Interactions (Use informal services)	Marginal Effects	Robust Standard Errors
1. Trust formal and 1. Minority	-0.023***	0.060	1. FemaleHead and 1. Secondary education	-0.098***	0.048
1.Minority and 1.wealth quintile	0.065*	0.003	1.FemaleHead and 1.Primary education	0.075**	0.051
			1.Trust formal and 1.High Fin. Literacy	-0.589***	0.006

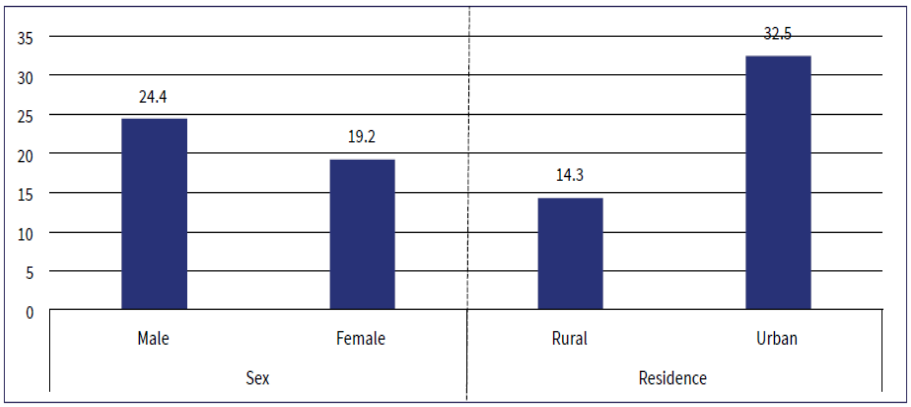
CHAPTER IV APPENDIX

IV-Appendix 1: Overall Financial Health and it Dimensions, 2016 and 2019 (%)



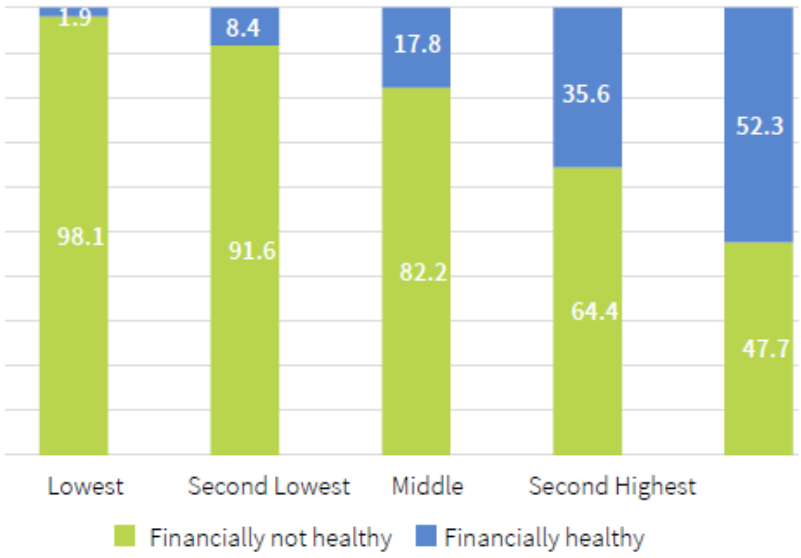
Source: FinAccess 2018 Survey

IV-Appendix 2: Financial Health by Sex and Residence



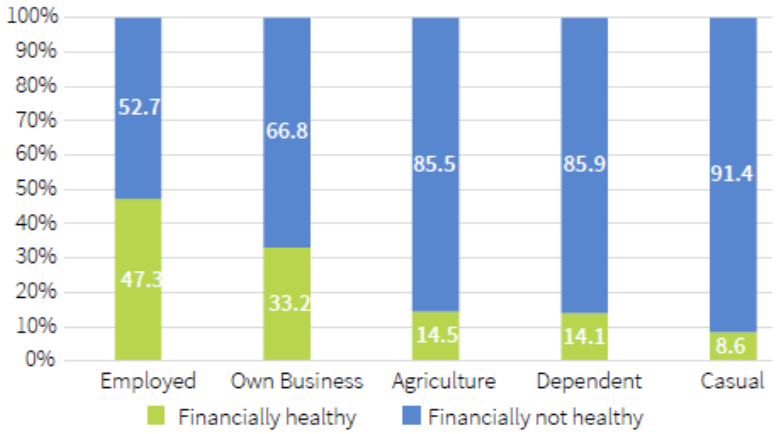
Source: FinAccess 2018 Survey

IV-Appendix 3: Financial Health by Wealth Quintile



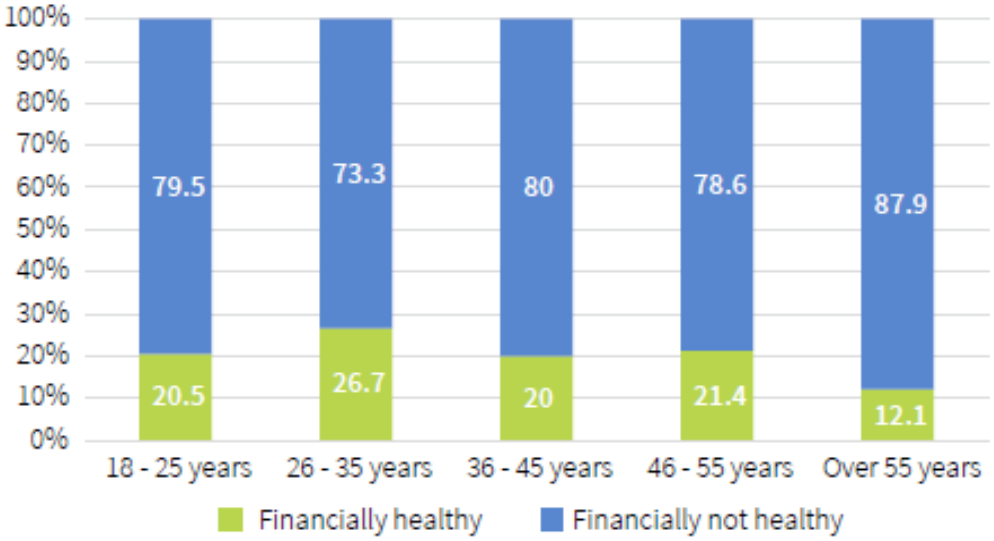
Source: FinAccess 2018 Survey

IV-Appendix 4: Financial Health by Livelihood



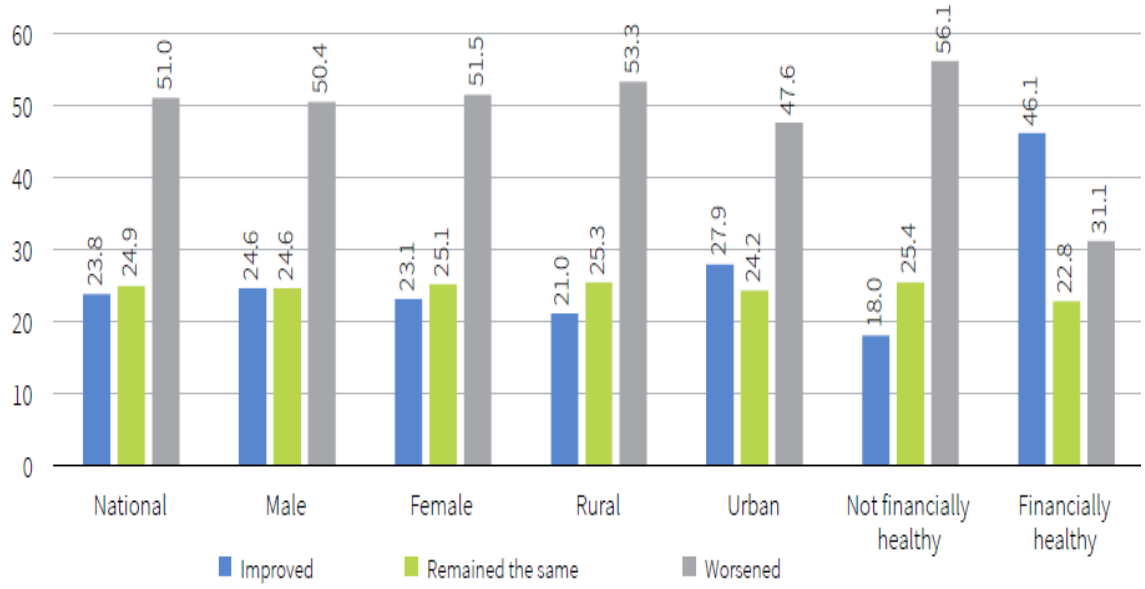
Source: FinAccess 2018 Survey

IV-Appendix 5: Financial Health by Age



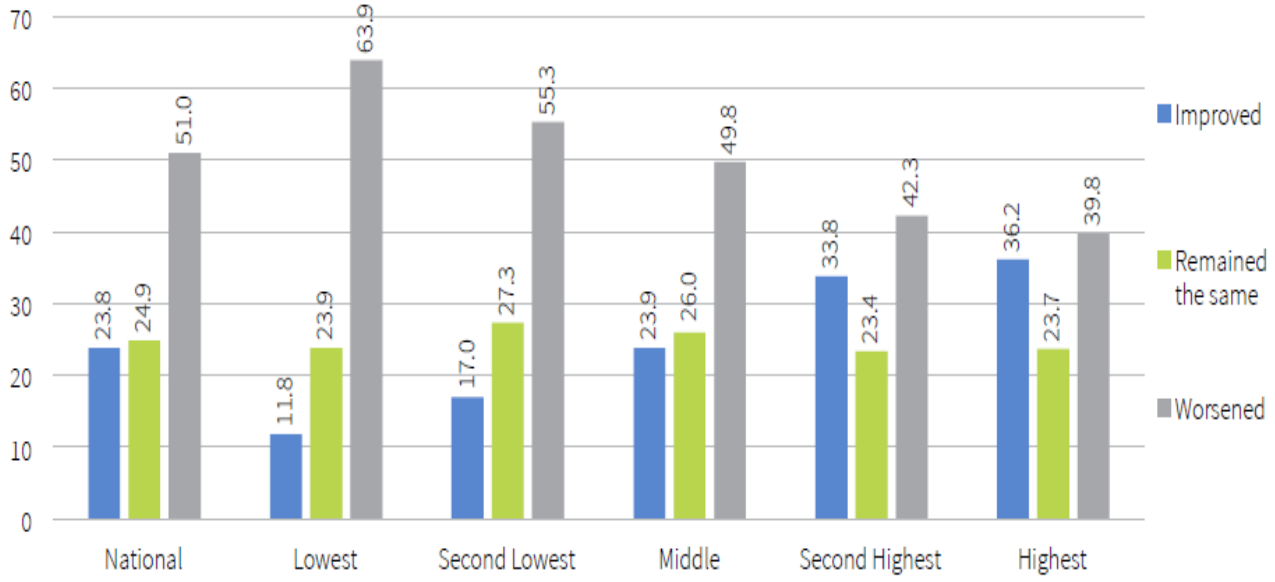
Source: FinAccess 2018 Survey

IV-Appendix 6: Financial Status by Sex, Residence and Financial Health



Source: FinAccess 2018 Survey

IV-Appendix 7: Financial Status by Wealth Quintile in 2019 (%)



Source: FinAccess 2018 Survey