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Research Report – BUSA 7388A

Determinants of Financial Inclusion in Zambia

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Research assignment submitted in fulfilment of the requirements of the degree of Master of Management in Finance and Investment.

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Abstract

Financial inclusion is a major issue in Zambia, understanding what determines financial inclusion in this country is crucial as it plays a huge role in boosting economic activity and economic growth. Due to multiple uncertainties in the economic environment, it is of great importance to have an appropriate understanding of the factors that have been instrumental in the great improvement in the financial inclusion metrics in Zambia over the years. This study seeks to establish the main determinants of financial inclusion in Zambia. We use the FinScope Household Survey data (2009 and 2015) that covers several household characteristics to perform Probit estimations. Our findings show that residing in the urban areas of Zambia, being a man, older, unmarried, educated (secondary or tertiary) and receiving a consistent income (wage/salaried or self-paid) significantly encourages financial inclusion, with a higher effect on education and income. We observe that formal financial services and informal financial services are the main drivers of financial inclusion in Zambia, still, with education and income having a greater effect in explaining the use of these services, leading to increased financial inclusion in Zambia. Our findings show that polices aimed at including those residing in rural areas and the uneducated are needed to better include this population, policies aimed at the inclusion of women in the country would help in decreasing the gender gap and extending the financial system to rural areas, and technological enhancements will aid in serving the rural population.

Keywords: Financial Inclusion; Determinants; Formal Financial Services; Informal Financial Services; Zambia

Declaration

I, Reatile Nthati Makoetje, hereby declare that;

- I am aware that using someone else's work without acknowledging the source and/or without their permission (plagiarism) is wrong.
- Confirm that the entirety of the work submitted for assessment is my own, with exception to where I have explicitly indicated otherwise.
- I have followed the appropriate procedures in referencing the work, thoughts and ideas of other authors.

Reatile Nthati Makoetje **October 2018**

Signed: …….

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1. Introduction

1.1 Context

In Zambia, financial inclusion is a deep-rooted policy priority. The recognition of the "gap in provision of financial services to the low-income households in the rural and per-urban areas" was documented in Zambia's first Financial Sector Deepening Plan (FSDP) through 2004-2009. Stressed as a vital challenge, a series of regulatory reforms was drawn to address the gap. The reforms comprised of infrastructure, regulatory and legal reforms (National Financial Inclusion Strategy (NFIS) Zambia, 2017). The following Financial Sector Development Plan II (2010-2015), openly prioritised financial inclusion, emphasizing "Increasing access to finance" as one of three strategic pillars. In the new strategic plan of The Bank of Zambia (2016-2019), a strategic objective to "increase formal financial inclusion by 16 percentage points to enhance living standards" was adopted. Lately, The Government of Zambia is undertaking a new financial sector Policy for Financial Sector Development in 2017, which foresees the broader financial sector and the important role of financial inclusion (National Financial Inclusion Strategy Zambia, 2017).

Joshi (2011) explains financial inclusion as the practice of safeguarding vulnerable individuals, such as low-income groups to have access to appropriate financial services and products, as well as to consumers who have access to financial services or products in a formal manner. The World Bank Global Financial Development Report (2014) highlights that low-income adults are afforded tools to save, borrow and make payments while managing risks posed by an inclusive financial system. This aids in decreasing the impacts of unanticipated falls in income common among those in the informal sector and in the facilitation of consumption smoothing.

The elevation of financial inclusion has grown among global development agencies (Kelly, 2016). At the 2010 Group of 20 (G20) summit in Korea, G20 leaders supported the Global Partnership for Financial Inclusion (GPFI), a platform to encourage financial inclusion practices and implement the Financial Inclusion Action Plan (FIAP) (Pierce and Ortega, 2012). In 2012, the World Bank joined this platform as did the Organization for Economic Development (OECD) in 2013, both as

implementing partners. As of November 2013, 50 countries including many in Africa such as Lesotho, Zambia, Nigeria and Rwanda had vowed to financial inclusion targets, prompting a comment from the World Bank President Jim Yong Kim stating, "with private sector and government support, universal access to financial services in these countries is a realistic target by 2020" (World Bank, 2013). Clearly financial inclusion has become a key global development issue.

Regardless of the substantial progress made in current years, a lot is still to be done in Zambia to realise widespread financial inclusion. Great sections of the population continue to be unserved or underserved by financial service providers, particularly, noteworthy inconsistencies persist between rural and urban regions, men and women and the youth and adults. Living conditions for the Zambian adult population can be improved through increased financial inclusion, affording them better life quality, as their involvement in productive economic activity will be increased (FinScope Zambia, 2015). Understanding the demographics and how Zambians make a living is of high importance to understanding the financial inclusion landscape and the possibility for increasing financial inclusion in Zambia.

The key role of financial inclusion is to convey the 'unbanked' populace into the formal financial system, aiding extensive access to investments, savings, credit and payment services (Hannig and Jansen, 2010). While financial inclusion in Zambia aims to expand the quality of the lives of Zambians by decreasing financial vulnerability and increasing the potential for involvement in economic activities, it helps empower women, the underprivileged and the poor residents, with the task of making them self-reliant and well informed to make better financial decisions (Singh et. al 2014).

According to FinScope Zambia (2015), the Zambian adult population consisted of 8.1 million individuals, mostly based in rural areas – more than half of this population (54.8%) resided in rural areas. Lusaka (19.3%) and the Copperbelt (16.6%) were the most populated provinces while Muchinga (5.4%) and North Western (5.0%) were the least populated. The rural nature of the

populace should be accounted for when general financial inclusion is considered. Furthermore, 51% of the adult population was female and 49.0% was male, the adult population was relatively young as 60.1% of the population were 35 years old or younger. The overall education level among the Zambian adult population was low: with 6.5% of Zambian adults having no formal education. Only half of the adult population has completed up to grade 9 while just 1.1% of the adult population has obtained a postgraduate qualification or higher. This means that a great part of the Zambian adult population lacks high education. Additionally, only 14.8% of the adult population relied on consistent, regular income streams in the form of salaries/wages whilst most of them relied on irregular, inconsistent inflows of money. Many the adult population, 22.8% with an overall of 36.8% of rural adults relied on farming/fishing activities for income, 19.7% mainly depended on others for their financial needs and 13.8% depended on piece work/casual labor for an income.

Financial inclusion relates to whether individuals can access financial products or services that satisfy their needs (Coovadia 2012). In addition, according to the FinScope Zambia 2015 report, financial inclusion in Zambia can be split into two sub-categories, namely, *'formally included'*[1] *or 'informally included'*[2].*Formal financial services* are described as financial products supplied by establishments governed by an Act of Parliament and *informal financial services* are offered by economic agents not recognized by law as formal financial institutions (Mwanza, 2015). Informal financial services include saving with an employer, membership of a savings group or borrowing from an informal moneylender (known as Kaloba) (FinScope Zambia, 2015). However, the informally included population is often the user of informal financial services.

The formally included populace is further divided into the 'banked'[3] population and the 'formal other' population (FinScope Zambia, 2015). The banked population consists of people using traditional financial services presented by commercial banks whilst the 'formal other' consists of

[1] Formally Included: The use of financial services (formal or informal) provided by institutions formally regulated.
[2] Informally Included: Individuals not making use of formal financial services, but use financial services provided by informal providers.
[3]Banked: Individuals using financial services provided by banks.

individuals using financial services supplied by formal financial institutions other than commercial banks, like microfinance institutions (MFIs) (FinScope Zambia, 2015). The components of financial inclusion are depicted graphically in figure 1.

Figure 1: Components of Financial Inclusion



Source: FinScope Zambia, 2015

The World Bank 2014 report explored the importance of proving the poor residing in rural areas with access to quality financial services. According to this report, only 5% of the Zambian adult population who own mobile phones used them for financial transactions, far less than the average of 16% in the Sub-Saharan Africa. The report also highlighted trials to financial inclusion, including high banking costs, encouraging the World Bank country director for Zambia to comment, "The main obstacle to financial inclusion is the high cost of formal banking services due to the small size of the banking sector." FinScope Zambia (2015) shows that financial inclusion in Zambia has significantly increased, with the 50% national target for financial inclusion having been surpassed by about 22% from 37.3% of the adult population in 2009 to 59.3% in 2015. Within this period, however, economic growth slowed down from 7.6% in 2010 to 5.0% in 2015 and was expected to remain on a downward trend in 2016 and 2017 because of several domestic and international shocks.

1.2 Problem Statement

This research seeks to investigate what explains financial inclusion in Zambia using two cycles of the FinScope Household Survey data (2009 and 2015). Due to uncertainties in the economic environment, it is imperative to have an appropriate understanding of the factors that have been accountable for the great improvement in the financial inclusion metrics in Zambia over the years. This improvement in financial inclusion will boost economic activity as well as growth in Zambia. As the proportion of adults financially included[4] has grown significantly between 2009 and 2015, the Zambian economy has also experienced a decline within the same period. This is an indication that economic growth has not, on its own, contributed to creating opportunities for financial inclusion in Zambia. To understand why a decline in the Zambian economy occurs with an increase in financial inclusion brings about the interest to study what exactly determines financial inclusion in Zambia.

1.3 Research Aims

The study aims to establish the determinants of financial inclusion in Zambia and the factors contributing to increased financial inclusion using household data. We also make contributions to the literature on the determinants of financial inclusion and financial regulation in Zambia.

To achieve the objectives above, we make use the FinScope Household Survey (2009 and 2015) data obtained from the Financial Sector Deepening Zambia website. We perform Probit estimations between the main indicators of financial inclusion and individual characteristics of the Zambian adult population, we also run the same regression on the use of formal and informal financial services used by the Zambia adult population. Further, we run a two-stage Instrumental Variables estimation, in efforts to further test our findings and observe the true relationships between the explanatory variables and the response variables (Y), to eliminate potential endogeneity issues.

[4] Financially Included: People's access and use of appropriate financial services, whether formal or informal (FinScope Zambia, 2015).

We find that urban residents are more likely to be financially included, that men are more likely to be financially included than women, and that older, unmarried, educated (secondary and tertiary) individuals with consistent incomes (waged/salaried and self-paid) have a significantly higher chance of being financially included. We further conclude that education and income are the main individual characteristics that explain financial inclusion in Zambia. In addition, we observe the use of formal and informal financial services being the main drivers of financial inclusion and that education and income explain the use of these services, leading to increased financial inclusion in Zambia.

The remainder of the paper is arranged as follows. Section 2 is the literature review chapter, which reviews all the relevant literature regarding the research objectives of this study. Section 3 describes the data used in this study. Section 4 presents the empirical design used to investigate the research objectives of the study and explains all the methods and techniques applied on the data to meet these objectives. Section 5 provides a discussion of the study's empirical findings and Section 6 is the conclusion and recommendations chapter summarizing the key points of the report.

2 Literature Review

The section provides the literature of financial inclusion with relation to its determinants (section 2.1) and financial regulation (section 2.2) respectively.

2.1 Determinants of Financial Inclusion

Nandru, Byram and Rentala (2016) suggest the term 'financial inclusion' encompasses the access to and use of financial and/or banking services (account ownership, savings, insurance, borrowing, remittance, payments, etc.) at affordable costs to a vast segment of disadvantaged and low-income groups in a society. Thus, financial inclusion is the delivery of financial services to the low-income groups, particularly the excluded sections of the populace, with the equal and affordable chances of accessing financial services (Singh *et al*., 2014).

Financial inclusion involves the access to and use of formal financial services and has become a subject of growing interest for researchers, policy makers, financial institutions and governments in developing countries (Allen et al, 2012; Beck & Torre, 2006; Camara & Tuesta, 2014). Naceur *et al*. (2015) have identified several determinants of financial inclusion. These factors are inclusive of those that control the costs of financial services delivery to the population, known as ***Structural factors*** and those that create empowering settings for financial inclusion, referred to as ***Policy-related factors***. A study by Love and Martínez Pería (2012) illustrates these *'policy-related factors'* as they find that countries with more competitive banking systems appreciate superior financial inclusion due to more firms having access to overdrafts and loans. Lastly, ***Non-policy characteristics*** of a country. Aga and Martínez Pería (2014) show that inflows of international remittances[5] to sub-Saharan Africa also assume roles in financial inclusion as a result of remittance recipients being highly likely to be banked.

[5] Remittances are the sending and receiving of money from a sender to a receiver using formal or informal means (FinScope Zambia, 2015).

Sarma and Pais (2011) highlight a few substantial factors for financial inclusion in a country, which include; income inequality, income, telephone, internet usage as well as literacy among adults. They suggest that countries experiencing low GDP per capita[6] tend to have weaker connectivity, lower levels of literacy and appear to be more financially exclusive than countries with a higher GDP per capita. Similarly, Evans and Adeoye (2016) conduct a study of the determinants of financial inclusion in Africa using the panel data approach. They observe that per capita income, broad money (% of GDP), literacy, internet access and Islamic banking presence and activity are significant factors explaining the level of financial inclusion in Africa. The study of Oyelami, Saibu and Adekenle (2017) investigates the determinants of financial inclusion in Sub-Saharan Africa using Panel Autoregressive Distributed Log (ARDL). Their results reveal that financial inclusion in this region is meaningfully influenced by both demand-side factors (level of income and literacy) and supply side factors (interest rate and bank innovation proxy by ATM usage).

2.1.1 Individual Characteristics

A stream of studies have been keen on investigating the individual characteristics of financial inclusion. Zins and Weill (2016) observe that all individual characteristics are significantly related to financial inclusion. Their empirical findings show that women have a reduced likelihood of owning a formal account or using formal savings, whereas an insignificant effect is seen relating to formal borrowing. They also find age to have a nonlinear relation with the indicators of financial inclusion, hence, older people are more likely to be financially included. In a similar study, Allen *et al*. (2016) analyse the individual characteristics of financial inclusion. They find that urban, more educated, richer, older, employed, married or separated individuals have much higher probabilities of bank account ownership from a formal financial institution. The same set of individual characteristics showed a higher likelihood of individuals having access to formally saving. Lastly, they find that the probability of formal borrowing increases for educated, older, richer and married men. Further,

[6] Gross Domestic Product per capita

Shihadeh (2018) observes that females and the poor are less likely to be included in financial systems, while education levels enhance financial inclusion in MENAP[7] countries.

In China, Fungácová and Weill (2015) conduct a study of financial inclusion. The empirical findings of the study report that more educated, richer, older men are highly likely to be financially included. The study also reports that possible lack of documentation or other family members having a formal bank account may put women in the financially excluded category. Moreover, they find that the choice between formal and informal credit is influenced by income and education, but higher formal borrowing is not dependent on education in China. Tuesta *et al*. (2015) find that education and income are both important features for financial inclusion in Argentina, while in India, Chithra and Selvam (2013) find that population, literacy, income, deposit and credit saturation are meaningfully connected with financial inclusion. In Peru, Camara, Peña and Tuesta (2014) show that traditionally more vulnerable groups (women, individuals living in rural areas and young people) are those with the greatest difficulties in accessing the formal financial system.

2.1.2 Access to Financial Services

Yoshino and Morgan (2016) explain that access to financial services has broad extents that reflect the variety of available financial services, these range from savings accounts and payments to borrowings, pensions and insurance. Growing evidence advocates that access to financial services can diminish poverty, raise income, and promote fiscal growth. However, these conclusions are, in some cases, still questionable, as previous studies depended on macro data, which were subject to quite a few issues, such as endogeneity and missing variables. Efobi *et al.* (2014) explored the factors influencing the access to and use of banking services in Nigeria. The results reveal that individual attributes, income and ICT[8] inclination are significant factors influencing the use of bank services in Nigeria.

[7] Middle East, North African, Afghanistan and Pakistan.
[8] Information and Communications Technology.

According to Mehrotra and Yetman (2015), unbanked adults have a 90% share of developing economies. They also state that account ownership is lowest in Africa, in these emerging economies. Evans and Adeoye (2016) show that account ownership amongst the adult population is at its peak in Mauritius (80%) and South Africa (54%), followed by Angola, Kenya, Mozambique, Zimbabwe, and Morocco (all around 40%) as financial inclusion differs by country and income level. While The World Bank (2018) states that according to the recently launched 2017 Global Findex, 1.2 billion adults have opened formal bank accounts since 2011, including 515 million in the last three years alone. In Africa, Allen *et al*. (2014) shows that populace mass is highly important for financial inclusion in African countries. On a related matter, Naceur *et al.* (2015) conduct an analysis using country-level data on the affiliation among Islamic banking and financial inclusion in Muslim countries. Astonishingly, their results indicated that, though financial access has seen rapid increases in these countries, financial usage has not improved as speedily. Their indication demonstrates a weak, positive correlation between financial inclusion, credit to households and to firms for financing investment.

Research showing the useful properties of financial inclusion for individuals supports the economic and political rationale for financial inclusion-promoting policies (Evans and Adeoye, 2016). Inadequate access to finance can result in inequality and poverty shocks as demonstrated by Banerjee and Newman (1993). However, Dupas and Robinson (2013) have recognised that access to savings increases consumption, productive investment, savings and female empowerment. In 29 major states, in India from 1995 to 2008, the determinants of financial inclusion have been employed by Kumar (2013). He finds that the environmental and socio-economic structure is substantial in determining the banking behaviours of the people of India. Akudugu (2013) investigates the determinants of financial inclusion among the adult population across Ghana. His empirical results show that lack of money, literacy, distance to financial institutions and lack of documentation are the main determinants of financial inclusion in Ghana as measured using the logit model. After assessing the relationship between financial inclusion and development in 49 developing countries across the world, a similar

conclusion was reached by Sarma and Pais (2011). Their findings indicate that the level financial inclusion and that of human development are strongly and positively correlated.

2.1.3 Mobile Money

The adoption of mobile phones to provide financial services in Africa has become instrumental in integrating the unbanked segments of a population to the mainstream financial systems. Scharwatt and Williamson (2015) explain that the major assets of mobile money services are convenience and affordability. The success of mobile money is rooted in its ability to be cheaper than other substitutes to cash. McKay and Pickens (2010) study an international comparison of 26 banks, their empirical findings show that branchless banking (including mobile money) is cheaper by a minimum of 19% on average than alternative services. In Kenya, M-PESA was routinely one-third to one-half as expensive as alternate systems. Lower transaction costs render money the poor can save, which lead to remittances increasing when transferred using M-PESA related to traditional forms of remittances. Jack and Suri (2014) examined the impact of reduced transaction costs of mobile money on risk sharing in Kenya. The findings showed that M-PESA users were able to fully absorb large negative income shocks (such as severe illness, job loss, livestock death and harvest or business failure) without any reduction in household consumption. On the other hand, mobile money has been slow to take root in Botswana due to high transaction costs. Ouma, Odongo and Were (2017) establish the linkage between the use of mobile phones to provide financial services and the increase in savings in selected countries in the Sub Saharan Africa, the findings show that the availability and use of mobile phones to provide financial services does indeed promote the likelihood of saving at a household level. They highlight that access to mobile financial services does not only boost savings, but also has a significant impact on the amount saved. They are of the opinion that this is due to the frequency and convenience with which such transactions can be undertaken using a mobile phone.

The benefits and likely power of mobile money with relation to the promotion of financial inclusion in developing countries is analysed by Donovan (2012). His findings highlight that mobile money is probable to contribute to financial inclusion in developing countries, and makes references

for suitable regulation to the industry. Moreover, Johnson and Arnold (2012) explore the key sources of financial exclusion in Kenya. Their results indicate that age and the level of education are the main challenges in accessing mobile money services in Kenya. In Mali, Sangaré and Guérin (2016) studies the impact of mobile money on formal savings practices. They suggest that issues such as low levels of education, irregular and informal incomes, lack of documents of identity as well as time and mobile constraints often explain the weak usage of mobile services by women (WWB, 2015). They conclude that in Mali, time and mobility constraints are the major factors. As mobile money is not as visible as cash, it has the benefits of discretion and independence. Research has observed that women are able to have personal savings without looking for permission from their husbands (Morawczynski 2009), but this independence stands for both genders.

2.1.4 The Gender Gap

Gender has been found to assume an important role in financial inclusion. FinMark Trust (2016) states that the gender gap prevails even in countries with the highest financial inclusion. They find that the gender gap in bank account ownership is highest in Botswana, Mauritius and Swaziland, while a positive gender gap is only found in South Africa. Demirgüc¸-Kunt *et al*. (2013b) study financial inclusion using the 2012 Global Findex on 98 developing countries. They find the existence of a significant gender gap in account ownership, formal saving and formal borrowing. Recently, Demirgüç-Kunt *et al*. (2015) confirm that a gender gap in financial inclusion exists even after controlling for individual characteristics such as rural residency, education, income, employment status and age. Aterido *et al*. (2013) evaluate this issue in nine African countries but fail to identify significant gender discrimination. The gender gap in African seems related to women being active outside the financial sector (Zins and Weill, 2016). Additionally, they suggest that African women are more probable to take part in informal financial services.

Several studies reporting the exclusion of women find that women are more excluded than men both at the individual and firm level (FinMark Trust, 2016). Beck *et al*. (2011) conduct a European study where they report that female lenders have fewer chances of securing a loan when the

officer is a male. They also find that loans with unfavourable terms that include shorter maturities and higher interest rates are allocated to female lenders assigned to opposite-sex officers. Strengthening the matter, Henderson *et al*. (2015) point out that in the US, men are treated more favourably when it comes to accessing credit lines than women, and minority applicants and women are worried that they receive even less favourable treatment from borrowers that is, in most cases, not related to their creditworthiness.

The gender gap brings about a negative influence on the economy of a country as excluding women from economic activities results in their contribution to economic development being missed. According to a few authors, women's financial exclusion seems to stem from their lack of education. For illustration, Knowles *et al*. (2002) report that the educational gender gap is an inhibition to economic growth. Klasen (2002) reports that gender inequality in education has a direct effect on economic growth by dropping the average level of human capital. While Klasen and Lamanna (2009) reported that economies in the MENA countries lose economic growth opportunities due to the gender gap in education, suggesting that barriers to female employment do not only pose disadvantages to women, but also appear to cut economic growth in both developed and developing countries.

2.1.5 Financial Inclusion in Zambia

In Zambia, The FinScope Survey (2015) reported education levels to be directly correlated to financial behaviour and literacy, making low education levels significant in addressing financial inclusion. The report has also shown substantial increases in financial inclusion since 2009, resulting in the 2018 50% financial inclusion national target being topped. In 2009, 37.3% of the adult population was financially included increasing to 59.3% of the adult population being financially included in 2015. Financial exclusion had dropped from 62.7% in 2009 to 40.7% of the adult population in 2015. The findings went on to display that financial inclusion is significantly tilted to urban areas with 70.3% of the included adult population residing in urban areas and 50.2% residing in rural areas.

Furthermore, an equally huge increase in the ownership of store-of-value transaction accounts was identified by The World Bank Global Findex Survey of 2014. The percentage of adults with an account at a formal financial institution increased by 15% to 36% between 2011 and 2014. This resulted in an increase of 1.2 million unique accounts. The 2015 FinScope Zambia Survey went on to show that banks remained the most broadly used provider of financial services and products as they reached 24.8% of adults. Additionally, mobile money providers reached 14.8% of the adults while 3.8% of the adults used microfinance services. Less than 6% of the adults were reported to use pension and/or insurance services while not as much of 1% of the adults were reported to utilise capital market instruments.

2.2 Financial inclusion and financial regulation

Even with the inadequacy of attention in the literature to direct links between financial inclusion and financial regulation, a few reports and papers have tried to address the significance of the relationship between these two aspects. Mwaza (2015) suggests that poor regulation is a major hindrance to financial inclusion. Others may consist of absence of decent infrastructure, weak institutions and poor assistance, and the instability in political and economic conditions. The Centre for Global Development (CGD) (2016), suggest that financial inclusion through changes in regulation is a necessity for two reasons. First, changes in regulation are frequently obligatory to allow productive approval and adaptation of innovative digital finance, encourage their use, and increase competition among their providers, for the poor to benefit from those new technologies. Second, advancements in improving financial inclusion should be in line with the traditional mandates of financial supervision and regulation, namely, maintaining its integrity, safeguarding the stability of the financial systems and protecting consumers.

According to Yoshino and Morgan (2016), financial regulators have been hesitant of financial inclusion because of the lack of documentation and higher credit risks accompanying small lenders. The Global Findex data base further reports that 18% of unbanked respondents in the world who didn't have a formal bank account quoted the documentation requirements for opening an account as

the main reason they didn't have a formal account. Elaborate examples relating to financial regulatory requirements are recognized by The United Nations Secretary-General's Special Advocate for Inclusive Finance for Development (2013) and The United Nations Conference on Trade and Development (2014) reports respectively.

The UNSGSA (2013) report observed that the financial regulatory requirement of address verification for accounts with small transactions and balances was mislaid in South Africa following the understanding that numerous poor people were incapable to deliver legal proof of residence. This lead to the population of people with bank accounts in the country increasing from 46% in 2004 to 63% in 2011 from this and other policies. The UNSGSA (2013) found a similar case occurred during 2008 in the Philippines, where the Central Bank issued a circular allowing 20 substitute documents as satisfactory formal identification for financial transactions. Additionally, the Central Bank enabled banks to use third parties for 'know-your-customer' verification, easing the processes of opening bank accounts or sending remittances. During 2011, the Mexican authorities created a line of systems for customer identification where no identification is required to open accounts, but ID[9] documents where required for higher-value transactions (UNSGSA, 2013). Through the UNSGSA (2013), it evident that easing financial regulatory requirements can potentially increase financial inclusion in an economy as the population of a country will gain more access to finance and banking services.

The UNCTAD (2014) highlights that The Financial Services Authority of the United Kingdom of Great Britain and Northern Ireland identified some policies to have restrictive effects on the low-income population's access to financial services. These include money-laundering regulations with rigorous requirements on identity and proof of residence, investment and saving regulations creating bias against low-value customers and cash-based social security benefits depriving the need to use formal banking services. These strategies result in financial regulations being a barrier of financial inclusion in economies and directly contribute to financial exclusion among the United Kingdom economy and population.

[9] Identity Document.

In Kenya, Allen *et al.* (2012), address the low-income population's access to financial services using the case of Equity Bank which has a specific business model that aims to reach low-income customers as well as underserved geographical areas. They find that Equity Bank's business model is probable to resolve the financial access problem in Kenya through its branch expansion strategy, enabling more Kenyan households' access to bank accounts and bank credit.

The Financial Action Task Force (FATF) ties financial inclusion with Anti-Money Laundering (AML) and Counter-Terrorist Financing (CTF), as it boosts transparency. This is founded on the notion that the increased use of formal financial services leads to the reduced use of informal financial services which stems from formal financial exclusion, posing a threat on financial integrity[10] (de Koker and Jentzsch, 2013). Isern and de Koker (2009) state that financial regulators (governments) have abilities to boost persons to use formal financial services, creating a setting that facilitates access to financial services, however difficulties to change consumer behaviour patterns have suffered. The Indonesian government is a relevant example as it tried to shield migrant workers by pushing them to use formal financial services. Migrant workers were required to open formal accounts prior to being employed in a foreign country. The tactic has seen some success, though employees still use informal financial services as they battle to meet documentation necessities.

In Zambia, The World Bank country director stresses the core impediment to financial inclusion as the high cost of formal banking services due to the small-scale banking sector. However, according to The World Bank (2014) study, in recent years, more Zambians have gained access to and now use quality financial services, but there is room for improvement as the country still lags its economic and geographic peers. de Luna Martínez (2006) maintains that the growing challenge for Zambia is the execution of international standards of prudential regulation that tend to oppose the goal of increasing access to finance for low-income households. Know-your-customer (KYC) rules issued by Zambia in order to join the international efforts to prevent money laundering and terrorism financing are seen as one of the major regulatory constraints in increasing access to finance. Yet, as

[10] Financial Integrity: measures that shield financial services from the abuse brought on by money laundering and terrorist financing (de Koker and Jentzsch, 2013).

the informal economy of Zambia consists of 90% of the country, the requirement of income and verification has proven to be a main challenge stopping wider provision of banking services. Therefore, establishing empirically whether regulatory requirements influence the financial inclusion of Zambians, and to make suggestions on improving and/or easing these regulations to accommodate the whole population in accessing finance is worthy.

3. Data

3.1 Data, sampling and population

For this study, data from two cycles (2009 and 2015) of the FinScope Household Survey available on the Financial Sector Deepening Zambia (FSDZ) website[11] is analysed, with a focus on the 2015 Survey. The surveys were both conducted through face-to-face interviews and covered 4,000 households[12] for the 2009 Survey, while the 2015 Survey covered 8570 households[13]. As the surveys have similar characteristics, the 2015 Survey provides an update to the 2009 Survey. As per The FinScope Zambia (2015) report, the 2015 Survey was conducted with two objectives in mind: firstly, to assess changes in the landscape of financial access since 2009, and secondly, to amount the extent to which numerous developments within the financial sector had influenced the levels of financial inclusion throughout Zambia.

The measuring instruments were developed by FinScope Zambia (2015) based on the following principles: firstly including, individuals' demographics, perceptions, and attitudes about financial services and institutions, income levels, income generating activities and money management strategies; secondly, the individual's role within the household and the influence thereof on the decisions of the individual; and lastly, the individual's community attributes, such as levels of accessing infrastructure. These measuring instruments were then translated into Zambia's seven official languages[14].

An area-based methodology was used for the sampling frame of the surveys, which used "population census" as the main frame, and warranted that citizens 16 years and older had equal probabilities of being sampled (FinScope Zambia Report, 2009). Thus, the sample consists of the population of adults 16 years and older within 12 reporting areas (i.e. rural and urban) and all provinces (nine). According to The FinScope Zambia Report (2015), the FinScope sampling

[11] http://fsdzambia.org/publication/finaccess2017/ (accessed 17 July 2017).
[12] Conducted between October and December 2009.
[13] Conducted between February/March 2015.
[14] Bemba, Nyanja, Lozi, Tonga, Kaonde, Luvale and Lunda.

methodology consists of three levels of sampling including first, drawing EAs[15]by means of a "probability to population size" method. The 2009 Survey selected 400 EAs ensuring urban-rural, provincial and district representativeness while for 2015, the survey selected 866 EAs; second, randomly grouping ten selected households in each sampled EA; and lastly, using a Kish Grid-diagram, an individual (i.e. the intended respondent) being nominated randomly from all individuals 16 years or older in each of the sampled households in the EA.

The FinScope Household Survey data is suitable for the analysis of this study for the following reasons. Firstly, it explores the trends in formal and informal financial inclusion. Secondly, provides opportunities to assess whether, and how, financial inclusion in Zambia has evolved over the five years between 2009 and 2015. Thirdly, the households surveyed are nationally representative as the sample has covered all parts of Zambia. Lastly, the survey provides essential data on individual and household characteristics which are important variables for this study's analysis.

Although the surveys are suitable for this study, they are not without weaknesses. Primarily, the actual surveys were conducted in 7 different languages. This raises the concern that some of the respondent's answers could have been lost in misinterpretation and/or translation. However, FinScope Zambia had robust preparation involving workshops, trainings, translation and interpretation with various stakeholders in efforts to minimize these risks. The sample size used in these surveys seems relatively small in comparison to the target population, reaching at least 0.06% of the Zambian population, however, the 2015 survey shows an improvement as it reached around 0.11% of the Zambian population. The individual level of sampling bound of 16 years seems a bit low, as 16-years-olds in most countries are still in school. This does not pose a risk on the data as in Zambia 16-year-olds are issued identity documents and can therefore open bank accounts. Also, an upper bound would have helped in limiting the study to "active and working individuals".

Staying close to previous literature, focus is made on the main indicators of financial inclusion. *Account ownership*, gauged by access/usage of financial services. *Savings*, measured by

[15] Enumeration Area: geographic area canvassed by one census representative (Statistics South Africa, 1998).

access/use of a saving at formal/informal financial institutions. *Borrowing*, refers to formal/informal sources of borrowing. *Mobile money*, referring to the use of a mobile phone to transfer funds. *Insurance*, measured using insurance products. All these variables are dummy variables equivalent to "1" if the respondent said "yes" and "0" for contradicting responses. *Formal financial services* measured by access/usage of formal services, *informal financial services* measured by access/usage of informal services *and financially included* measured by access/usage of formal or informal financial services are all dummy variables equivalent to "1" if the respondent has access/usage and "0" if they do not. Table A1 of the appendix displays the definitions of the main indicators of financial inclusion and the individual characteristics used in our estimations.

Table 1 presents the descriptive statistics for the main financial inclusion indicators and individual characteristics taken from the FinScope Zambia surveys of 2009 and 2015 used in this study. We provide the means of our sample and compare them with each other among the two years. For the financial inclusion indicators, the table shows an improvement of 11.36% in *account ownership*, from 14.73% of Zambia adults owning bank accounts in 2009 to 26.09% in 2015. Furthermore, an increase of 53.37% in *savings* is seen. This is from 10.53% of Zambia's adult population using savings products in 2009 to 63.90% of the adult population engaging in saving activities in 2015. This could be due to the increase in account ownership, allowing for individuals to save as they make use of banking products. *Borrowings* among the adult population shows a decrease of 32.15% in 2015, falling to 4.55% from 36.70% in 2009, indicating that less Zambian adults use borrowing facilities.

As *mobile money* had not penetrated in Zambia in 2009, its usability was not surveyed by FinScope Zambia in 2009. Highlighting its popularity amongst the adult population in Zambia, it reached up to 15.13% of this population in 2015. This implied significant growth in the non-banking sector in Zambia. However, *insurance* usage increased from 1% in 2009 to 2.87% in 2015, displaying a 1.87% increase in the use of insurance products among surveyed individuals. *Formal financial services* decreased by 3.69%, from 44.08% of the adult population reporting to make use of these services in 2009, to 40.39% adults using them in 2015. However, *informal financial services* usage

increased from 3.45% in 2009 among the adult population to 39.17% in 2015. This increase in informal financial services seems to have driven the increase in financial inclusion in 2015. Lastly, adults financially included in Zambia increased from 46.58% in 2009 to 61.26% in 2015, an increase of 14.68% in the financial inclusion in Zambia.

For the individual characteristics, region is a dummy variable equivalent to "1" if the individual resides in an urban area and "0" elsewise. Household size is the number of individuals in the household and electric energy is measured by the main energy used in a household, equivalent to "1" if the household uses electric energy and "0" if not. Gender is a dummy variable equivalent to "1" if the individual is a male and "0" otherwise. Age group has various categories. To take it into account, five dummy variables are used (16-25 years, 26-35 years, 36-45 years, 46-55 years and 56+ years), where "1" is equivalent to the respondent falling within the age group and "0" for contradicting responses. Marital status is a dummy variable equivalent to "1" if the individual is married and "0" otherwise, where cohabitating individuals have been defined as married.

Education is presented in two categories. Secondary education is a dummy variable equivalent to "1" if the respondent completed secondary education and "0" elsewise. Tertiary education is a dummy variable equivalent to "1" if the respondent completed tertiary education or more and "0" elsewise. Lastly, three categories present income. Waged/Salaried is a dummy variable equivalent to "1" if the respondent receives a consistent income from an employer and "0" otherwise. Self-employed is equivalent to "1" if the respondent provides their own income through a self-owned business and "0" otherwise. Farming/Fishing is a dummy variable equivalent to "1" if the respondent generates their income through farming/fishing activities and "0" otherwise (See Table A1 of the appendix).

Similarly, table 1 provides the changes in several individual characteristics of the Zambian adult population. In 2009, there with approximately 6.4 million adults in Zambia, 40.25% of the adult population reported to reside in urban areas. However, there seemed to be a shift in 2015. With 8.1 million adults, 57.58% of the adult population was urban based, indicating a 17.33% increase in

individuals residing in urban areas. This skewness towards urban areas may indicate that financial inclusion is advanced in urban areas than it is in rural areas. The gender distribution seemed fairly even in 2009, with 47.33% of the adult population being male, while in 2015, the gender distribution seemed skewed towards females, as 38.00% of the adult population was reported to consist of males.

In relation to the age groups, the adult population appeared to be relatively young in both years. In 2009, 61.35% of the adult population was 35 years or younger, while in 2015, 62.34% of the adult population was 35 years or younger. Furthermore, the middle to older aged adult population, comprising of adults aged 36 years or older, decreased from 37.83% in 2009 to 37.67% in 2015, a 0.16% decrease. The marital status demographic was slightly skewed towards unmarried individuals of the adult population in 2009, where 38.10% of the adult population was married and 38.13% of the adult population was married in 2015. Individuals who had completed secondary education decreased to 32.11% in 2015, from 34.63% in 2009, those who had completed tertiary education or more also decreased from 7.08% in 2009 to 0.99% in 2015.

According to The FinScope Zambia (2015) report, majority of the adult population (22.8%) was involved in farming/fishing activities as a means of generating income. However, the sources of income among the Zambia adult population increased over the years, except for those who generated incomes from farming/fishing activities, 40.33% of the individuals generated incomes from farming/fishing activities in 2009, while 29.50% of these individuals used farming/fishing activities to generate income in 2015. Moreover, numerous individuals received incomes from self-owned businesses than those who received incomes from employers in 2015.

Table 1: Descriptive statistics for the individual characteristics and financial inclusion, 2009 and 2015

Variable	2009					2015				
	Mean	Std. Dev.	Min	Max	Obs.	Mean	Std. Dev.	Min	Max	Obs.
Region – Urban	0.4025	0.4905	0	1	4000	0.5758	0.4943	1	1	8479
Household Size	5.4280	2.7510	1	53	4000	5.1917	2.6728	0	20	8479
Energy – Electric	0.1658	0.3713	0	1	4000	0.1684	0.3743	0	1	8479
Gender – Male	0.4733	0.4993	0	1	4000	0.3800	0.4854	0	1	8479
Age group (16-25 years)	0.3095	0.4623	0	1	4000	0.3202	0.4666	0	1	8479
Age group (26-35 years)	0.3040	0.4600	0	1	4000	0.3032	0.4597	0	1	8479
Age group (36-45years)	0.1708	0.3764	0	1	4000	0.1786	0.3830	0	1	8479
Age group (46-55 years)	0.0945	0.2926	0	1	4000	0.0964	0.2951	0	1	8479
Age group (56+ years)	0.1130	0.3166	0	1	4000	0.1017	0.3022	0	1	8479
Marital Status – Married	0.3810	0.4857	0	1	4000	0.3813	0.4857	0	1	8479
Education – Secondary	0.3463	0.4758	0	1	4000	0.3211	0.4669	0	1	8479
Education – Tertiary	0.0708	0.2564	0	1	4000	0.0099	0.0990	0	1	8479
Income – Waged/Salaried	0.0670	0.2500	0	1	4000	0.1949	0.3962	0	1	8479
Income – Self-employed	0.1893	0.3918	0	1	4000	0.2668	0.4423	0	1	8479
Income – Farming/Fishing	0.4033	0.4906	0	1	4000	0.2950	0.4560	0	1	8479
Account Ownership	0.1473	0.3544	0	1	4000	0.2609	0.4391	0	1	8479
Savings	0.1053	0.3118	0	4	4000	0.6390	0.4803	0	1	8479
Borrowing	0.3670	0.4820	0	1	4000	0.0455	0.2085	0	1	8479
Mobile Money	-	-	-	-	-	0.1513	0.3584	0	1	8479
Insurance	0.0100	0.0995	0	1	4000	0.0287	0.1669	0	1	8479
Formal Financial Services	0.4408	0.4965	0	1	4000	0.4039	0.4907	0	1	8479
Informal Financial Services	0.0345	0.1825	0	1	4000	0.3917	0.4882	0	1	8479
Financially Included	0.4658	0.4989	0	1	4000	0.6128	0.4872	0	1	8479

The table displays the summary statistics of variables from the 2009 and 2015 FinScope household surveys for the individual characteristics and the dependent variables (main indicators of financial inclusion) studied in our estimations.

4. Empirical Design

4.1 Analysis of data

To establish the determinants of financial inclusion in Zambia, Probit estimations are used to assess the impact of the individual characteristics on the main indicators of financial inclusion. This Probit regression is estimated using the FinScope (2015) household survey data described in section 3. The following equation will be used:

$$\boldsymbol{Y_i = \alpha + \beta X_i + \varepsilon_i} \quad (1)$$

Where $\boldsymbol{Y_i}$ is the financial inclusion variable presenting a given individual, denoting various indicators of financial inclusion such as account ownership, savings, borrowing, mobile money, insurance and accessibility categories such as formal and informal access. The indicators of financial inclusion are measured in binary, where "1" represents usage/access and "0" represents the lack of usage/access for a given individual. $\boldsymbol{\alpha}$ is the constant variable. Given several factors used to explain financial inclusion, the Probit estimations technique will enable us to estimate an individual's probability of falling into one of the categories and hence being financially included (Burns and Burns, 2008).

$\boldsymbol{X_i}$ is a vector of explanatory variables represented by several individual characteristics that contribute to the probability of being financially included (see i.e. Zins and Weill, 2016; Allen *et al.* 2012) such as, region of respondent ("1" if urban), type of energy used ("1" if electric), gender of respondent ("1" if male), age groups have various categories ("1" if the respondent falls within a category), marital status ("1" if married), secondary education ("1" if completed), tertiary education ("1" if completed tertiary education or more), Salaried/Waged source of income ("1" if yes or "0"

otherwise), Self-employed source of income ("1" if yes of "0" otherwise) and Farming/Fishing activities source of income ("1" if yes or "0" otherwise).

As equation (1) may result in biased estimates between financial inclusion and various explanatory variables, possible endogeneity concerns arise. The explanatory variables of concern include individuals residing in urban areas, this is due issues like greater financial inclusion being expected in urban areas, as they are better developed with resources and infrastructure, resulting in more growth opportunities (Allen et.al, 2012). The population in these areas have a higher demand for financial services as they are easily accessible to them. Tertiary education or more may have a strong relationship with financial inclusion as those who have completed tertiary education or more may be greatly informed and aware of the financial sector and how it operates, giving them an advantage over those who have low levels of education or no education at all. Lastly, income may also present endogeneity problems as individuals who receive incomes from an employer (waged/salaries) are most times required by their employers to have bank accounts to receive their wages/salaries.

To ease these potential endogeneity problems, a two-stage Instrumental Variables (IV) regression is used to run robustness checks, where we rerun the baseline regression on the probability of owning a bank account, saving, borrowing, using mobile money and insurance. The baseline regression will also be rerun on the probability of using formal/informal financial services with financially included instrumented against all explanatory variables. This approach is used to account for unexpected behaviour between variables and will allow us to observe the true correlation between the explanatory variables and the response variables (Y).Further, because of instances of clustering in financial inclusion (i.e. among individual characteristics) we control for clustering by computing standard errors of our estimates. From our results, we expect to establish the main determinants of financial inclusion in Zambia, and make a few policy recommendations.

5. Empirical Results

5.1 Determinants of financial inclusion

In this section, the results from the binary Probit estimations of the main indicators of financial inclusion in Zambia are interpreted. Account ownership, Savings, Borrowing, Mobile money and Insurance are the dependent variables.

Table 2 displays the results of the regression. Like the results of Zins and Weill (2016) in Africa, our findings show that all individual characteristics are significant financial inclusion. Residing in urban areas in Zambia significantly increases the probability of financial inclusion. We observe positive significant coefficients for account ownership and mobile money (both at 1% significance level). Negative significant coefficients for borrowing (10% significance level) and insurance (1% significance level), and no significant result for saving. Individuals in urban areas have greater probabilities of being financially included due to having greater financial sectors in these areas, with greater demands for financial services, while individuals in rural regions are unable to access these facilities. Surprisingly, we observe that household size significantly encourages savings (5% significant level), while intuitively, the number of individuals per household should discourage savings. The positive sign is therefore contrary to expectation but consistent with Ackah and Acquah (2012), who find similar results in Ghana. They find that the wealth level of the household greatly contributes to the use of savings products among households. As savings reduce risk and vulnerability shocks for the poor, this may be a reason for why household size in Zambia encourages saving.

Kodongo (2017) observes that better financial access is related with more affluent members of society in Kenya (less food vulnerable, own permanent houses and consume refined energy). We, similarly, find that financial inclusion favours individuals in households using electric energy (indicators are positively significant at 1% significance level). Being a male significantly increases the chances of being financially included in Zambia, as Fungácová and Weill (2015) find in China and Zins and Weill (2016) find in Africa. We find positive significant relationships among men at the 1% level of significance for account ownership, savings and mobile money, while no significant results

are seen for borrowing and insurance. This is because more females are reported to use someone else's bank account (especially in Zambia, Tanzania and Swaziland), and females appear to be more financially illiterate than their counterparts (FinMark Trust, 2016).

For age, we observe that being young (16-25 and 26-35 years old) significantly discourages account ownership and borrowing (both at 1% significance level), while those between 16-25 years discourage insurance (1% significance level), with no significant result for the decreased insurance use among those between 26-35 years. Further, these two groups have significantly greater chances of using savings products (both at 1% significance level), and those between 26-35 years have a significantly higher chance of using mobile money (1% significance level), with no significant result shown for those aged 16-25 years and their relationship with mobile money. Younger people (16-25 years) tend to be financial inclusion disadvantaged because financial institutions in Zambia neglect youth groups, by not engaging them as specific target groups and by failing to offer them services that fulfil their needs and characteristics (McNulty and Nagarajan, 2005). According to Sykes *et al*. (2016), there are various reasons for the youth to remain underserved. The most common are policy and regulatory barriers that set a minimum age and identity requirements for opening accounts. High transaction costs and banking charges also discourage the young, as they most times do not have funds to maintain these accounts.

Furthermore, we notice that middle aged and older people (36-45 and 46 -55 years old) have a higher likelihood to be financially included, like the observations of Zins and Weill (2016) in Africa. Being 36-45 years old reduces the chances of owning a bank account while being 46-55 years increases the chances, with no significant results observed. Significant results are seen between these two age groups concerning saving in Zambia (both at 1% significance level). While no significant result is observed for the middle aged concerning borrowing, the older aged show a 5% significance level in their increased chances of using borrowing facilities. Being older significantly increases the chances of using mobile money (1% significance level for those 36-45 years old and 10% for those 46-55 years old). However, those 36-45 years old show no significant result for insurance, while being 46-55 years old significantly increases the chances of using insurance products (10%

significance level). The results prove that being older does indeed grant higher chances of being financially included, although after a certain age, this probability deteriorates as long distances to the nearest bank branch or financial institutions may be a far-reach for the elderly (Zins and Weill, 2016).

We find that being married significantly reduces the probability of being financially included, especially among women in the Zambian adult population. The results show negative coefficients for account ownership, savings, borrowing and insurance among married individuals in Zambia (at 1% significance levels and 10% significance level), with no significant result for mobile money. The European Commission (2008) notes that this is consistent with quantitative research showing that married women give up having bank accounts of their own as their husbands already have one. The results point out that both measures of education, secondary and tertiary, have a significant effect on financial inclusion in Zambia (all indicators at 1% significance level for both measures). The role of education in explaining financial inclusion is studied by various authors (see *inter alia*: Demirgüç-Kunt and Klapper 2012a and Triki and Faye, 2013). Mzobe (2015) highlights that in developing economies, adults with a tertiary or secondary education are on average more than twice as likely to be financially included than those with a primary education or less. This is the case in Zambia, and such inequalities stress the importance of financial literacy/education when expanding financial inclusion to the unbanked and underserved.

Lastly, we find that income is directly allied with financial inclusion in Zambia. We observe that all three measures of income, waged/salaried, self-employed and farming/fishing activities, have a significant effect on financial inclusion. However, there is tendency amongst farmers not to be included in the context of mobile money usage, which is not unexpected because the majority of farmers in the country are rural-based with poor access to mobile phone services. We observe a 1% significance level for all the main indicators of financial inclusion for waged/salaried individuals, as their consistent incomes enable them to own bank accounts, save, borrow, use mobile money and take out insurance policies. Moreover, these individuals are required to have bank accounts by their employers to receive their wages/salaries, which automatically includes them (Aslan *et al*., 2017).

Table 2: Determinants of financial inclusion in Zambia, 2015

	Account Ownership	Savings	Borrowing	Mobile Money	Insurance
Constant	-1.3272***	-0.2517***	-2.2730***	-2.0635***	-2.8781***
	(0.075)	(0.062)	(0.135)	(0.096)	(0.198)
Region – Urban	0.2143***	-0.0332	-0.1255*	0.4528***	-0.2266***
	(0.039)	(0.032)	(0.069)	(0.044)	(0.084)
Household Size	0.0096	0.0121**	0.0139	-0.0061	0.0030
	(0.007)	(0.005)	(0.011)	(0.007)	(0.014)
Energy – Electric	0.7383***	0.2184***	0.4488***	0.2660***	0.4657***
	(0.045)	(0.046)	(0.068)	(0.047)	(0.081)
Gender – Male	0.1111***	0.1797***	0.0214	0.2015***	0.1078
	(0.036)	(0.031)	(0.059)	(0.039)	(0.074)
Age group (16-25 years)	-0.5724***	0.1726***	-0.5428***	0.0143	-0.4755***
	(0.063)	(0.051)	(0.125)	(0.077)	(0.168)
Age group (26-35 years)	-0.230***	0.3844***	-0.0949	0.2746***	0.0249
	(0.062)	(0.052)	(0.109)	(0.076)	(0.1516
Age group (36-45 years)	-0.0811	0.3559***	0.1272	0.2922***	0.2593
	(0.066)	(0.056)	(0.111)	(0.082)	(0.158)
Age group (46-55 years)	0.0942	0.3037***	0.2622**	0.1607*	0.2966*
	(0.073)	(0.064)	(0.120)	(0.093)	(0.170)
Marital Status – Married	-0204***	-0.1907***	-0.2829***	0.0054	-0.1389*
	(0.038)	(0.031)	(0.067)	(0.040)	(0.079)
Education – Secondary	0.9102***	0.3285***	0.6765***	0.7322***	0.9525***
	(0.039)	(0.0358)	(0.067)	(0.041)	(0.089)
Education – Tertiary	2.3303***	1.1142***	1.3198***	0.9501***	1.2857**
	(0.285)	(0.245)	(0.165)	(0.151)	(0.175)
Income – Waged/Salaried	0.8772***	0.4532***	0.7841***	0.2817***	0.8662***
	(0.044)	(0.043)	(0.064)	(0.047)	(0.080)
Income – Self-employed	0.1674***	0.2375***	0.0064	0.2520***	0.0832
	(0.040)	(0.035)	(0.074)	(0.043)	(0.092)
Income – Farming/Fishing	0.0201***	0.096***	-0.0607	-0.1081**	-0.0543
	(0.042)	(0.034)	(0.084)	(0.048)	(0.116)
Observations	8479	8479	8479	8479	8479
Adjusted R^2	0.276	0.056	0.255	0.165	0.301
Log likelihood	-3510.695	-5220.194	-1153.928	-2994.613	-758.722
Predicted probability (at mean values)	0.293	0.370	0.045	0.189	0.017

The table reports Probit estimations of the determinants of the main indicators of financial inclusion in Zambia. Account ownership, Savings, Borrowings, Mobile money and Insurance are the dependent variables. The individual characteristics are the explanatory variables described in table 1. Coefficient estimates are presented, and standard errors are in parentheses.

*Significance at 10% level

**Significance at 5% level

***Significance at 1% level

Individuals receiving incomes from self-owned businesses show significant results for account ownership, saving and mobile money (all at 1% significance level), as do the individuals that generate income from farming/fishing activities, with a 5% significance level for mobile money. Like Allen *et al*. (2016) worldwide and Fungácová and Weill (2015) find in China, we find wealthier and more educated adults are more likely to be financially included in Zambia. As with our results, Asuming, Osei-Agyei and Mohammed (2018) find that individual level covariates (age, education, gender and wealth) are significant predictors of financial inclusion in sub-Saharan Africa. Nandru, Byram and Rentala (2016) examine the impact of bank account ownership and the use of banking services as determinants of financial inclusion in India. Their results indicate that income level and education have a significant impact on financial inclusion as measured by the ownership of a bank account. While Wale and Makina (2017) find that account ownership and use are higher among males, middle aged, high income and educated individuals as we do for Zambia. We therefore conclude that education and income are the most important individual characteristics in explaining financial inclusion in Zambia as Tuesta *et al*. (2015) observe in Argentina.

5.2 Determinants of formal/informal financial services and financial inclusion

This section reports and interprets the results of the binary Probit estimations for the determinants of formal and informal financial services in Zambia as the classification of these services is deemed to be the main driver of financial inclusion in the country (FinScope Zambia, 2015). Formal financial services, informal financial services and financially included are the dependent variables.

Table 3 reports the results of the regression. As expected, we start by observing that individuals in the Zambian adult population residing in urban areas significantly encourage the use of both formal financial services and informal financial services (both at 1% significance level), significantly encouraging their financial inclusion (1% significance level). Urban areas are often endowed with infrastructure that enables the presence of financial services (FinScope Lesotho, 2011). As a result, access to financial services is higher in urban regions than it is in rural regions. We

observe that household size is irrelevant for formal/informal financial services, and hence financial inclusion in Zambia. In Africa, poor households often struggle to access financial services, regardless of the number of persons in the household, while well-off households effectively access financial services Ackah and Acquah (2012). The financial sector being insufficiently developed poses serious obstacles on economic development, especially when directed to the poor in Zambia. Next, we see that households using electricity favour the use formal financial services and are financially included (both at 1% significance level), with no significant result for informal financial services as Kodongo (2017) finds in Kenya. Being a male significantly increases the probability of using formal financial services (1% significance level) while it significantly reduces the chances of using informal financial services (1% significance level), resulting in greater chances of being financially included (1% significance level).As men are often more educated than women, there are more knowledgeable and eligible to be financially included. This result is consistent with that of Klasen and Lammana (2009) in MENA economies.

We further establish that individuals aged between 16-25 years have a significantly reduced likelihood of using formal financial services (1% significance level), yet they have a significantly increased chance of using informal financial services (1% significance level), resulting in a significantly negative coefficient in financial inclusion for them (5% significance level).Further, being aged between 26-35 years shows a lower chance of using formal services (5% significance level), while significant higher chances of using informal financial services are observed. We acknowledge that people in this age group have significantly higher chances of being financially included (1% significance level). The younger population is constrained by lower levels of financial literacy and KYC requirements that they fail to meet to access formal financial services, driving them to rely more on informal financial services (Lusardi *et al*., 2010).

Individuals aged 36-45 years show no effect on using formal financial services among them, and a 1% significant increase in their chances of using informal financial services, showing a 1% significant positive coefficient for financial inclusion among them. Additionally, those aged 46-55 years display a significantly increased chance of using formal financial services (10% significance

level), while they show a 1% significant chance of using informal financial service, displaying a positive coefficient (1% significance level) of this age group being financially included. Although the older population is relatively financially included in Zambia, the European Bank for Reconstruction and Development (EBRD) Transition report 2016-17 highlights that, with time, older people will be discouraged by extensive distances from financial service points/centres, lowering their financial inclusion status.

We see that being married significantly reduces the chances of using formal financial services and informal financial services (both at 1% significance level), and that being married significantly dampens financial inclusion in Zambia (1% significance level). FinMark Trust (2016) finds that this mostly occurs among married woman, as they are concerned about lack of money and experience lack of documentation issues. Furthermore, because their husbands use financial services, they inevitably don't deem it necessary to use them as well. Fungácová and Weill (2015) find income and education impact the selection between formal and informal services, we find both secondary and tertiary education show positive coefficients (both at 1% significance level) for the use of formal financial services and no significant results for informal financial services. The two education categories significantly increase the probability of an individual being financially included (1% significance level).

Finally, Zambian adults generating income from farming/fishing activities show no significant results for all the dependent variables, whereas those who receive incomes from an employer (waged/salaried) and those who receive incomes from self-owned businesses display positive coefficients (all at 1% significance level) for the use of formal financial services, informal financial services and being financially included. Following the results displayed by the tables, we conclude that education and income are the individual characteristics that best describe the use of formal/informal financial services and the determination of financial inclusion in the country. These results are similar to Camara, Peña and Tuesta (2014), who display of income levels and education being important variables for financial inclusion levels in Peru, as well as to Nandru, Byram and Rentala (2016) who provide the same evidence in India.

Table 3: Determinants of formal/informal financial services and financial inclusion in Zambia, 2015

	Formal Financial Services	Informal Financial Services	Financially Included
Constant	-0.9418***	-0.5457***	-0.2424***
	(0.068)	(0.064)	(0.063)
Region – Urban	0.3770***	0.1007***	0.2994***
	(0.034)	(0.032)	(0.032)
Household Size	0.0015	-0.0058	-0.0060
	(0.006)	(0.005)	(0.006)
Energy – Electric	0.5772***	0.0327	0.4886***
	(0.046)	(0.0422)	(0.050)
Gender – Male	0.1915***	-0.1678***	0.0438***
	(0.033)	(0.030)	(0.032)
Age group (16-25 years)	-0.4789***	0.2468***	-0.1031**
	(0.057)	(0.054)	(0.052)
Age group (26-35 years)	-0.1266**	0.4367***	0.2022***
	(0.056)	(0.054)	(0.054)
Age group (36-45 years)	0.0264	0.4013***	0.2345***
	(0.060)	(0.058)	(0.057)
Age group (46-55 years)	0.1266*	0.2403***	0.2145***
	(0.068)	(0.066)	(0.065)
Marital Status – Married	-0.1061***	-0.2389***	-0.2690***
	(0.034)	(0.031)	(0.032)
Education – Secondary	0.9240***	0.034	0.5857***
	(0.036)	(0.035)	(0.037)
Education – Tertiary	2.0961***	-0.1571	1.4482***
	(0.319)	(0.142)	(0.311)
Income – Waged/Salaried	0.6435***	0.2529***	0.5881***
	(0.043)	(0.040)	(0.046)
Income – Self-employed	0.2129***	0.1256***	0.2170***
	(0.036)	(0.033)	(0.035)
Income – Farming/fishing	0.0131	-0.0538	0.0061
	(0.036)	(0.033)	(0.034)
Observations	8479	8479	8479
Adjusted R^2	0.219	0.027	0.126
Log likelihood	-4452.149	-5507.278	-4933.408
Predicted probability (at mean values)	0.386	0.383	0.374

The table reports Probit estimations of the determinants of formal/informal financial services and financial inclusion in Zambia. Formal financial services, informal financial services and financially included are the dependent variables. The individual characteristics are the explanatory variables described in table 1. Coefficient estimates are presented, and standard errors are in parentheses.

*Significance at 10% level

**Significance at 5% level

***Significance at 1% level

5.3 **Robustness Checks** *(Further Testing)*

As mentioned in Section 4, potential endogeneity problems may arise between financial inclusion and various explanatory variables (i.e. region, tertiary education and income). An Instrumental Variables (IV) approach is used to account for unexpected behaviour between variables, this will allow us to see the true correlation between the explanatory variables and the response variables (*Y,*) reducing the potential of endogeneity. Table 4 and table 5 report the results from our two-stage IV (linear) model, financially included was instrumented with all the individual characteristics described in table 1. The individual characteristics were chosen in efforts to observe accurate behaviour between financial inclusion and the different individual characteristics of the Zambian adult population. We estimate IV models for our baseline regressions reported in table 2 and table 3. Expectedly, the results in table 4 seem to replicate those of table 2, they indicate that the impact of residing in an urban area on the probability of owning a bank account and using mobile money remain positive and greatly statistically significant (1% significance level).

The difference with the Probit estimations is seen in the decrease of the account ownership coefficient, from 0.2143 to 0.0420 and the mobile money coefficient, from 0.4528 to 0.0702. In line with the results in table 2, we also observe that the impact of residing in urban areas on the probability of borrowing and using insurance remains negative and statistically significant (1% significance level), the significance level greatly improves for borrowing under the IV estimations, from 10% to 1%. No significant result is reported for savings as in the Probit estimations. Household size still proves to be irrelevant for financial inclusion and refined energy (electric) homes still encourage financial inclusion. The impact of having completed secondary education and tertiary education or more in Zambia on the probability of being financially included remains positive and statistically significant. Owing a bank account, saving, borrowing, using mobile money and insurance all report a 1% significance level in the IV estimates as they did for the Probit estimates. The difference between the two estimates is seen in the declining coefficients computed under the IV estimations.

Receiving a waged/salaried income in Zambia also has an impact on the probability of being financially included. We find positive statistically significant coefficients for all the dependent variables (1% significance level) under the IV estimations as we did under the Probit estimations. The coefficients decrease under IV estimations from those observed in the Probit estimations, indicating the difference in the results between the two. Overall, we observe the true correlation between region, tertiary education and waged/salaried incomes and financial inclusion. The results show that all individual characteristics are vital for the main indicators of financial inclusion, with education and income observed as the main individual characteristics that describe the use of these indicators, and ultimately, financial inclusion in Zambia (FinScope Zambia, 2015).

Table 5 presents the two-stage IV estimations for the use of formal and informal financial services. As with the Probit estimations, the impact of residing in urban areas on the probability of using either formal/informal financial services remain positively statistically significant (1% significance level), with declining coefficients under the IV estimations, for formal financial services, from 0.3770 in the Probit estimations to 0.1154 for IV estimations and for informal services, from 0.1007 to 0.0375.

We observe having completed secondary education or tertiary education and more remains positive and statistically significant for the probability of using formal financial services (1% significance level). The Probit estimations reported a coefficient of 2.0961, while the IV estimations report a coefficient of 0.4212, demonstrating the difference in these two estimations. Still, no significant result is seen for the use of informal financial services. The results further show that individuals with waged/salaried incomes are positively linked to the use of formal/informal financial services in Zambia (1% significance level) (FinScope Zambia, 2015), although the coefficients are declining under the IV estimations, they are still statistically significant. We observe that education and income remain to be the individual characteristics that explain the use of formal/informal financial services among the Zambian adult population. The results from the IV estimations closely imitate those from the Probit estimations, eventually reporting the same relationships between variables with more robust results eliminating potential endogeneity.

Table 4: Instrumental Variables - Determinants of financial inclusion in Zambia, 2015

	Account Ownership	Savings	Borrowing	Mobile Money	Insurance
Constant	0.1099***	0.4090***	0.0181**	-0.0121	0.0050
	(0.017)	(0.023)	(0.008)	(0.014)	(0.006)
Region – Urban	0.0420***	-0.0100	-0.0132***	0.0702***	-0.0135***
	(0.009)	(0.012)	(0.005)	(0.008)	(0.004)
Household Size	0.0019	0.0045**	0.0008	-0.0018	-0.0004
	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)
Energy – Electric	0.2404***	0.0689***	0.0571***	0.0876***	0.0403***
	(0.015)	(0.014)	(0.009)	(0.014)	(0.008)
Gender – Male	0.0269***	0.0642***	0.0017	0.0408***	0.0026
	(0.009)	(0.011)	(0.005)	(0.008)	(0.004)
Age Bucket (16-25 years)	-0.1399***	0.0692***	-0.0336***	-0.0076	-0.0177***
	(0.143)	(0.019)	(0.007)	(0.011)	(0.005)
Age Bucket (26-35 years)	-0.0560***	0.1411***	-0.0071	0.0509***	0.0037
	(0.015)	(0.019)	(0.007)	(0.012)	(0.005)
Age Bucket (36-45 years)	-0.0232	0.1310***	0.0170**	0.0536***	0.0188***
	(0.016)	(0.020)	(0.008)	(0.013)	(0.006)
Age Bucket (46-55 years)	0.0224	0.1135***	0.0272***	0.0254*	0.0187**
	(0.019)	(0.023)	(0.010)	(0.015)	(0.008)
Marital Status – Married	-0.0531***	-0.0681***	-0.0264***	-0.0010	-0.0119***
	(0.009)	(0.011)	(0.004)	(0.008)	(0.004)
Education – Secondary	0.2591***	0.1125***	0.0594***	0.1718***	0.0495***
	(0.011)	(0.012)	(0.006)	(0.010)	(0.005)
Education – Tertiary	0.4880***	0.2258***	0.3098***	0.2704***	0.1946***
	(0.026)	(0.027)	(0.051)	(0.056)	(0.047)
Income – Waged/Salaried	0.2659***	0.1505***	0.0998***	0.0690***	0.0733**
	(0.013)	(0.014)	(0.008)	(0.012)	(0.007)
Income – Self-employed	0.0389***	0.0882***	-0.0071*	0.0427***	-0.0038
	(0.010)	(0.012)	(0.003)	(0.009)	(0.003)
Income – Farming/Fishing	0.0006	0.0380***	-0.0057	-0.0165**	-0.004
	(0.009)	(0.012)	(0.003)	(0.008)	(0.002)
Observations	8479	8479	8479	8479	8479
Adjusted R^2	0.316	0.070	0.1341	0.1447	0.1076
Log likelihood	-3437.303	-5499.390	1881.810	-2660.111	3624.67

The table reports two-stage IV (linear) models of the probability of owning a bank account, saving, borrowing, using mobile money and insurance against the explanatory variables listed. Financially Included is instrumented with all the explanatory variables. Coefficient estimates are presented, and standard errors are in parentheses.

*Significance at 10% level

**Significance at 5% level

***Significance at 1% level

Table 5: Instrumental Variables - Determinants of formal and informal financial services in Zambia, 2015

	Formal Financial Services	Informal Financial Services
Constant	0.1827***	0.3017***
	(0.020)	(0.022)
Region – Urban	0.1154***	0.0375***
	(0.010)	(0.012)
Household Size	0.0005	-0.0023
	(0.002)	(0.002)
Energy – Electric	0.1813***	0.0135
	(0.014)	(0.016)
Gender – Male	0.0580***	-0.0634***
	(0.001)	(0.011)
Age Bucket (16-25 years)	-0.1409***	0.0836***
	(0.017)	(0.018)
Age Bucket (26-35 years)	-0.0381**	0.1564***
	(0.017)	(0.018)
Age Bucket (36-45 years)	0.0040	0.1418***
	(0.019)	(0.012)
Age Bucket (46-55 years)	0.0400*	0.0801***
	(0.021)	(0.022)
Marital Status – Married	-0.0335***	-0.089***
	(0.010)	(0.011)
Education – Secondary	0.3155***	0.0130
	(0.012)	(0.013)
Education – Tertiary	0.4212***	-0.0581
	(0.023)	(0.052)
Income – Waged/Salaried	0.2031***	0.0956***
	(0.014)	(0.015)
Income – Self-employed	0.0712***	0.0465***
	(0.011)	(0.013)
Income – Farming/fishing	0.0007	-0.0207*
	(0.011)	(0.012)
Observations	8479	8479
Adjusted R^2	0.271	0.038
Log likelihood	-4650.094	-5780.901

The table reports two-stage IV (linear) models of the probability of using formal and informal financial services against the explanatory variables listed. Financially Included is instrumented with all the explanatory variables. Coefficient estimates are presented, and standard errors are in parentheses.

*Significance at 10% level

**Significance at 5% level

***Significance at 1% level

6. Conclusion and Recommendations

Despite the increase in financial inclusion levels between 2009 and 2015, the financial inclusion levels in Zambia remain rather low relative to other African countries (FinScope, 2015). Comparative to men, women still experience low levels of financial inclusion and significant differences between the rural and urban adult populations still endure. Understanding the determinants of financial inclusion in Zambia is an important issue as financial inclusion can boost economic growth and greatly contribute to poverty alleviation in Zambia.

In this study, we run a Probit regression between the main indicators of financial inclusion and the individual characteristics of the Zambian adult population using household data from the FinScope Household Survey (2015).We also run the same regression, using the same data set, on the use of formal and informal financial services used by the Zambia adult population. Further, we run a two-stage Instrumental Variables estimation, to further test our findings and observe the true relationships between the explanatory variables and the response variables (*Y*), to eliminate potential endogeneity issues. The results from the two estimations can be summarized as follows.

We observe that financial inclusion in Zambia is skewed towards urban areas, where urban residents have a significantly greater probability of being financially included. We further find that men have higher chances of being financially included than women do, and that older, unmarried, educated (secondary and tertiary or more) individuals among the Zambian adult population, with consistent incomes (waged/salaried and self-paid) have a significantly greater chance financial inclusion. As Zins and Weill (2016) suggest, these findings support the view that financial inclusion favouring policies should target groups like the rural population, women and individuals with no formal education.

We further establish that education and income are the main individual characteristics that explain financial inclusion in Zambia. Also, we observe the use of formal and informal financial services being the focal drivers of financial inclusion as using these services significantly increases the likelihood of individuals in the Zambian adult population being financially included. We therefore

conclude that education and income explain the use of these services, leading to increased financial inclusion in Zambia.

Regarding policies to improve financial inclusion in Zambia, The Government of Zambia ought to establish and implement policies aimed at financially including women in the country. As education proves to be a positive driver of financial inclusion, government driven policies for financial inclusion aimed at educating girls and women can be beneficial. As Asuming, Osei-Agyei and Mohammed (2018) suggest that financial inclusion policies should target key populations like women and young people in sub-Saharan Africa, similar policies may assist in alleviating the gender gap in financial inclusion in Zambia. There is also the need to set up policies that will address financial inclusion among the rural population, extending the financial system to reach these areas. Given that at least 42.42% of the population resides in rural areas, these policies will assist in increasing the number of rural residents financially included in Zambia. Increased access to education, formal and informal financial services can be key in achieving this.

The results of this study indicate that to have a comprehensive financially included population, the Zambian government needs to craft policies that promote the use of both formal and informal financial services. More resources need to be channelled to the expansion of the financial sector in Zambia to increase access to financial institutions and technological enhancements, including wider coverage of internet and mobile network access for mobile money usage. This will enable banks, insurance companies, and mobile operators etc. to expand their current coverage to reach a wider populace, more specifically, those that reside in rural areas.

References

Ackah, C. and Acquah, A., 2012. Which Households Use Which Financial Services? Evidence from Ghana. *Institite of Statistical, Social and Economic Research*. University of Ghana.

Aga, G.A. and Martinez Peria, M.S., 2014. International remittances and financial inclusion in Sub-Saharan Africa. *World Bank Policy Research Working Paper No. 6991*, July.

Akudugu, M.A., 2013. The determinants of financial inclusion in Western Africa: insights from Ghana, *Research Journal of Finance and Accounting* 4 (8), 1-9.

Allen, F., Carletti, E., Cull, R., Qian, J., Senbet, L.W. and Valenzuela, P., 2012. Improving access to banking: Evidence from Kenya. *Paper presented at the 2012 Summer Research Conference on "Recent Advances in Corporate Finance," at the Centre for Analytical Finance, Indian School of Business in Hyderabad.*

Allen, F., Carletti, E., Cull, R., Qian, J.Q., Senbet, L. and Valenzuela, P., 2014. The African financial development and financial inclusion gaps. *Journal of African economies* 23 (5), 614-642.

Allen. F., Demirguc-Kunt, A., Klapper, L and Peria Martinez, S. M., 2012. "The Foundations of Financial Inclusion Understanding Ownership and Use of Formal Accounts". *Policy Research Working Paper No. 6290*, World Bank, Washington, DC.

Allen, F., Demirguc-Kunt, A., Klapper, L. and Peria, M.S.M., 2016. The foundations of financial inclusion: Understanding ownership and use of formal accounts. *Journal of Financial Intermediation* 27, 1-30.

Aslan, G., Delechat, C., Newiak, M. and Yang, F., 2017. Inequality in Financial Inclusion and Income Inequality. *IMF Working Paper No.17/236*, February.

Asuming, P.O., Osei-Agyei, L.G. and Mohammed, J.I., 2018. Financial Inclusion in Sub-Saharan African: Recent Trends and Determinants. *Journal of African Business*, June.

Aterido, R., Beck, T. and Iacovone, L., 2013. Access to finance in sub-Saharan Africa: Is there a gender gap? *World Development* 47, 102-120.

Banerjee, A.V. and Newman, A.F., 1993. Occupational choice and the process of development. *Journal of Political Economy* 101 (2), 274-298.

Beck, T., Behr, P. and Madestam, A., 2011. Sex and credit: Is there a gender bias in lending? *European Banking Centre Discussion Working Paper No. 2011-027*, September.

Beck, T. and Torre De la, A. 2006. "The basic analytics of access to financial services". Latin America Regional Study on Access to Finance, *World Bank.*

Burns, R.P. and Burns, R., 2008. Business research methods and statistics using SPSS. *Sage*, November.

Camara, N., Peña, X. and Tuesta, D., 2014. Factors that matter for financial inclusion: Evidence *from* Peru. *BBVA Microfinance Foundation Working Paper No. 1409*, February.

Camara, N. and Tuesta, D. 2014. "Measuring financial inclusion: A multidimensional index". *BBVA Research Working paper No.14/26*, March.

Chithra, N., and Selvam, M., 2013. Determinants of financial inclusion: An empirical study on the inter-state variations in India. *Available at: SSRN 2296096*.

Coovadia, C., 2012. Working definition of financial inclusion. [Online]. Available: http://www.banking.org.za/miscellaneous/FI_SUPPLEMENT_eVersion.pdf (Accessed 23 April 2017).

de Koker, L. and Jentzsch, N., 2013. Financial inclusion and financial integrity: aligned incentives? *World development* 44, 267-280.

de Luna Martínez, J., 2006. Access to Financial Services in Zambia. *World Bank Policy Research Working Paper No. 4061*, November.

Demirgüc¸-Kunt, A., Klapper, L., 2012a. Measuring financial inclusion; The Global Findex Database. *The World Bank Policy Research Working Paper No. 6025*. Washington, DC: The World Bank.

Demirgüc¸-Kunt, A., Klapper, L. and Singer, D., 2013b. Financial Inclusion and Legal Discrimination against Women: Evidence from Developing Countries. *Policy Research Working Paper No. 6416*. Washington, DC: The World Bank.

Demirgüç-Kunt, A., Klapper, L. F., Singer, D. and Van Oudheusden, P., 2015. The Global Findex Database 2014: measuring financial inclusion around the world. *World Bank Policy Research Working Paper No.7255.* Washington DC: The World Bank.

Donovan, K., 2012. Mobile money for financial inclusion. *Information and Communications for Development* 61 (1), 61-73.

Dupas, P. and Robinson, J., 2013. Savings constraints and microenterprise development: Evidence from a field experiment in Kenya. *American Economic Journal: Applied Economics* 5 (1), 163-192.

Efobi, U., Beecroft, I. and Osabuohien, E., 2014. "Access to and use of bank services in Nigeria: Micro-econometric evidence". *Review of Development Finance* 5, 104-114.

Evans, O. and Adeoye, B., 2016. Determinants of Financial Inclusion in Africa: A Dynamic Panel Data Approach. *University of Mauritius Research Journal* 22, 310-336.

FinMark Trust., 2016. Gender and Financial Inclusion: Analysis of financial inclusion of women in the SADC region. *Policy Research Paper No. 01/2016*, August.
FinScope. 2015. Financial Sector Deepening Zambia. [Online]. Available: http://www.fsdzambia.org/wp-content/uploads/2016/05/FINSCOPE-REPORT-2015.pdf (Accessed 10 April 2017).

FinScope. 2015. Financial Sector Deepening Zambia. [Online]. Available: http://www.fsdzambia.org/wp-content/uploads/2016/05/FINSCOPE-REPORT-2015.pdf (Accessed 10 April 2017).

FinScope. 2011. FinScope Lesotho 2011: Top Line Findings. [Online]. Available: http://www.finmark.org.za/finscope-lesotho-2011/FINSCOPE-LESOTHO-2011.pdf. (Assessed 12 February 2018).

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

Hannig, A. and Jansen, S., 2010. Financial Inclusion and Financial Stability: Current Policy Issues. *ADBI Working Paper No. 259*, December.

Henderson, L., Herring, C., Horton, H.D. and Thomas, M., 2015. Credit Where Credit is due? Race, Gender, and Discrimination in the Credit Scores of Business Start-ups. *The Review of Black Political Economy* 42 (4), 459-479.

Isern, J. and de Koker, L., 2009. AML/CFT: strengthening financial inclusion and integrity, *CGAP Focus Note*, Washington, D.C..

Jack, W. and Suri, T., 2014. Risk sharing and transactions costs: evidence from Kenya's mobile money revolution. *Am. Economic. Review* 104 (1), 183–223.

Johnson, S. and Arnold, S., 2012. Inclusive Financial Markets: Is Transformation under way in Kenya? *Development Policy Review* 30 (6), 719-748.

Joshi, D.P., 2011. Financial inclusion & financial literacy. BI OCED Seminar. *Indonesia: Reserve Bank of India.*

Kelly, P.S., 2016. Access to formal financial services in sub-Saharan Africa: Does gender really matter? MCom. *Stellenbosch University.*

Klasen, S., 2002. Low schooling for girls, slower growth for all? Cross-country evidence on the effect of gender inequality in education on economic development. *The World Bank Economic Review* 16 (3), 345-373.

Klasen, S. and Lamanna, F., 2009. The impact of gender inequality in education and employment on economic growth: new evidence for a panel of countries. *Feminist economics* 15 (3), 91-132.

Kodongo, O., 2017. Financial Regulations, Financial Literacy and Financial Inclusion: Insights from Kenya. Journal of Emerging Markets Finance and Trade, DOI. [Online]. Available: https: //doi.org/10.1080/1540496X.2017.1418318. (Assessed 23 March 2018).

Knowles, S., Lorgelly, P.K. and Owen, P.D., 2002. Are educational gender gaps a brake on economic development? *Oxford Economic Papers* 54, 118-149.

Kumar, N., 2013. Financial inclusion and its determinants: evidence from India. *Journal of Financial Economic Policy* 5 (1), 4-19.

Love, I. and Martínez Pería, M.S., 2014. How bank competition affects firms' access to finance. *The World Bank Economic Review* 29 (3), 413-448.

Lusardi, A., Mitchelle, O. and Curto, V., 2010. Financial Literacy among the Young. *Journal of Consumer Affairs* 44 (2), 358-380.

McKay, C. and Pickens, M., 2010. Branchless Banking 2010: Who's served? At What Price? What's next? *Focus Note. 66,* September.

Mehrotra, A. N. and Yetman, J., 2015. Financial Inclusion-Issues for Central Banks. *BIS Quarterly Review,* March.

Morawczynski, O., 2009. Examining the Usage and Impact of Transformational M-Banking in Kenya. *Internationalization, Design and Global Development*, ed. Nurgy Aykin, 495–504.

Mwaza, L., 2015. The State of Financial Inclusion in Zambia for Bank Products. MIDE. *University of Zambia.*

Mzobe, N., 2015. The role of education and financial inclusion in Africa: The case of selected African countries. Mcom. *Stellenbosch University*.

Naceur, M. S. B., Barajas, M. A. and Massara, M. A., 2015. Can Islamic Banking Increase Financial Inclusion? *International Monetary Fund Working Paper No. 15-31,* February.

Nandru, P., Byram, A. and Rentala, S., 2016. Determinants of Financial Inclusion: Evidence from account ownership and use of banking services. *International Journal of Entrepreneurship and Developmental Studies (IJEDS)* 4 (2), 141-155.

NFIS. 2017. National Financial Inclusion Strategy Zambia 2017-2022 [Online]. Available: http://www.mof.gov.za/jdownloads/other%2520Documents/nfis_zambia.pdf (Accessed 6 December 2017).

OECD. 2009. Competition and Financial Markets: Key Findings. [pdf]. South Africa: OECD. Available at: http://www.oecd.org/daf/fin/financial markets/key findings.pdf (Assessed 24 July 2017).

OECD. 2013. Financial literacy and inclusion: Result of OECD/INFE survey across countries and by gender. South Africa: OECD [Online]. Available: http://www.oecd.org/daf/fin/financial education/TrustFund2013_OECD_INFE_Fin_Lit_and_Incl_SurveyResults_by_Country_andGender.pdf(Assessed 24 April 2017).

Ouma, S.A., Odongo, T.M. and Were, M., 2017. Mobile financial services and financial inclusion: Is it a boon for savings mobilization? *Review of Development Finance* 7 (2017), 29-35.

Oyelami, L.O., Saibu, O.M. and Adekunle, B.S., 2017. Determinants of Financial Inclusion in Sub-Saharan African countries. *Covenant Journal of Business & Social Sciences (CJBSS)* 8 (4).

Pierce, D. and Ortega, C., 2012. Financial Inclusion Strategies Reference Framework. *Washington DC: World Bank.*

Sangaré, M. and Guérin, I., 2016. Mobile Money and Financial Inclusion in Mali: What has been the Impact on Saving Practices? 7 Diderot. *University of Paris.*

Sarma, M., and Pais, J., 2011. Financial inclusion and development. *Journal of International Development* 23 (5), 613-628.

Scharwatt, C. and Williamson, C., 2015. Mobile money crosses borders: New remittance models in West Africa. *GSMA, London*.

Shihadeh, F.H., 2018. "How individual's characteristics influence financial inclusion: evidence from MENAP". *International Journal of Islamic and Middle Eastern Finance and Management.*

Singh, C., Mittal, A., Garg, R., Goenka, A., Goud, R.P., Ram, K., Suresh, R.V., Chandrakar, R. and Kumar, U. 2014. Financial inclusion in India: Select issues. *IIMB Working Paper No*. 474**,** November.

Sykes, J., Elder, S., Gurbuzer, Y. and Princip, M., 2016. Exploring the linkages between youth financial inclusion and job creation: Evidence from the ILO school-to-school transition surveys. [Online]. Available: http://www.ilo.org/publns. (Assessed 14 March 2018).

The Centre for Global Development (OECD). 2016. Financial Regulations for Improving Financial Inclusion: A CGD Task Force Report. [Online]. Available: http://www.cgdev.org> publication > files/pdf/10.5696/4875-948554-1157 (Assessed 10 July 2017).

The European Commission. 2008. Financial Services Provision and Prevention of Financial Exclusion. [Online]. Available: http://Ec.europa.eu/employment_social/spsi. (Assessed 14 March 2018).

The European Bank for Reconstruction and Development Transition Report. 2016-17. Transition for all: Equal opportunities in an unequal world – Financial Inclusion. [Online]. Available: http://www.ebdr.com/documents/oce/pdf-transition report-201617-english.pdf. (Assessed 20 March 2018).

The World Bank. 2012. Financial inclusion in Africa: An overview. [Online]. Available: http://elibrary.worldbank.org/doi/pdf/10.1596/1813-9450-6088 (Accessed 23 April 2017).

The World Bank Group. 2014. Fourth Zambia Economic Brief. [Online]. Available at: http//www.worldbank.org>publication>Zambia>files/pdf/-27433-346262425-737842 (Assessed 18 August 2017).

The World Bank - CPMI. 2015. Payments Aspects for Financial Inclusion. [Online]. Available: http://www.worldbank.org/en/topic/financialinclusion/brief/pafi-task-force-abd-report (Assessed 10 March 2018).

The World Bank. 2018. World Bank Research E-Newsletter-A Monthly Summary of Our New Research. [Online]. Available: http//www.pubdocs.worldbank.org/en/2843815281197477 (Assessed 24 September 2018).

Triki, T. and Faye, I. 2013. Financial Inclusion in Africa. African Development Bank (AFDB). [Online]. Available: http//www.microfinancegateway.org/sites/default/files/mfg-en-paper-financil-inclusion-in-africa-2013.pdf (Assessed 2 June 2017).

Tuesta, D., Sorensen, G., Haring, A. and Camara, N., 2015. Financial inclusion and its determinants: The Case of Argentina. *BBVA Microfinance Foundation Working Paper No.1503*, January.

UNSGSA. 2013. Proportional and Risk-Based Controls Promote Both Financial Inclusion and Financial Integrity [Online]. Available at: http/www.unsgsa.org/resources/impact-stories/proportionaland- risk-based-controls-promote-both-financial.pdf (Assessed 19 August 2017).

Wale, L.E. and Makina, D., 2017. "Account ownership and use of financial services among individuals: Evidence from selected Sub-Saharan economies". *African Journal of Economic and Management Studies* 4 (1), 19-35.

World Bank. 2013. Universal financial access is vital to reducing poverty, innovation key to overcoming the enormous challenge, says President Jim Yong Kim. [Online]. Available: http://www.worldbank.org/en/news/press-release/2013/10/11/universal-financial-access-vitalreducing-poverty-innovation-jim-yong-kim (Accessed 27 April 2017).

World Bank. 2014. Fourth Zambia Economic Brief Highlights the Importance of Financial Inclusion for Rural Population. [Online]. Available: http://www.worldbank.org/en/country/zambia/publication/zambia-fourth-economic-brief-financial-services-reaching-every-zambian (Accessed 27 April 2017).

World Bank. 2014. Global Financial Development Report: Financial Inclusion. [Online]. Available: http://www.openknowledge.worldbank.org/handle/10986/16238 (Assessed 5 December 2017).

Yoshino, N. and Morgan, P., 2016. Overview of Financial Inclusion, Regulation, and Education. *Asia Development Bank Institute Working Paper No. 591,* September.

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

Appendix

Table A1: Definitions of the dependent variables and individual characteristics

Variable	Definition
Region – Urban	Dummy variable equivalent to one if the respondent resides in an urban area.
Household Size	Number of individuals in respondent's household – ratio scale.
Energy – Electric	Dummy variable equivalent to one if electric energy is used.
Gender – Male	Dummy variable equivalent to one if the respondent is male.
Age group (16-25 years)	Dummy variable equivalent to one if the respondent falls within this group.
Age group (26-35 years)	Dummy variable equivalent to one if the respondent falls within this group.
Age group (36-45 years)	Dummy variable equivalent to one if the respondent falls within this group.
Age group (46-55 years)	Dummy variable equivalent to one if the respondent falls within this group.
Age group (56+ years)	Dummy variable equivalent to one if the respondent falls within this group.
Marital Status – Married	Dummy variable equivalent to one if the respondent is married.
Education – Secondary	Dummy variable equivalent to one if the respondent has completed secondary education.
Education – Tertiary	Dummy variable equivalent to one if the respondent has completed tertiary education or more.
Income – Waged/Salaried	Dummy variable equivalent to one if the respondent receives a waged/salaried income.
Income – Self-employed	Dummy variable equivalent to one if the respondent receives an income from a self-owned business.
Income – Farming/Fishing	Dummy variable equivalent to one if the respondent generates an income from farming/fishing activities.
Account Ownership	Dummy variable equivalent to one if the respondent has access/uses a bank account.
Savings	Dummy variable equivalent to one if the respondent has access/uses saving products.
Borrowing	Dummy variable equivalent to one of the respondent has access/uses borrowing facilities.
Mobile Money	Dummy variable equivalent to one if the respondent has access/uses mobile money.
Insurance	Dummy variable equivalent to one if the respondent has access/uses insurance products.
Formal Financial Services	Dummy variable equivalent to one if the respondent has access/uses formal financial services – from regulated financial institutions.
Informal Financial Services	Dummy variable equivalent to one of the respondent has access/uses informal financial services – from unregulated financial institutions
Financially Included	Dummy variable equivalent to one if the respondent has access/uses either formal or informal financial services.

The table displays the definitions of the dependent variables and individual characteristics used in our estimations.