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CROSS-COUNTRY EVIDENCE FROM THE FINSCOPE SURVEYS

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Abstract

Economic theory and recent empirical evidence suggest that access to savings, payment and credit services can play a key role in poverty alleviation. Despite this, significant financial exclusion persists across sub-Saharan Africa. By pooling eleven nationally representative surveys, this paper examines the role of individual, geographic and national characteristics in influencing the use of formal financial services. While evidence is found for the importance of an individual's income, education, psychometric perspective and proximity to services in the likelihood of having personal access to financial services, cross-country differences also play a significant role. Although financial access is likely to have a slow-burning effect on the household's welfare, a novel instrument, level of trust in banks, helps identify a causal role for use of financial services in influencing an individual's income.

1. Introduction

Access to financial services is widely considered essential for the economic well-being of households in low income countries. Savings, payment and credit services facilitate household level consumption smoothing, help insure against risk and allow investment in education and other forms of capital. Despite this, levels of access to financial services vary widely with up to 2.5 billion people globally outside the formal banking system (Morduch et al, 2009). In Africa, estimates from the Finscope Surveys suggest that the proportion of the population with access to formal financial services ranges from 8 percent in Mozambique to 54 percent in neighbouring South Africa.

While innovations in microfinance have taken centre stage in efforts to expand financial access over the last two decades, attention is now shifting to opportunities to reform formal banking systems to open savings, loan and insurance products up to the financially excluded (Karlan and Morduch, 2009). Despite growing interest in formal banking systems, there was until recently limited availability of detailed surveys of household usage of financial services in sub-Saharan Africa, especially at the cross-country level (Beck and Demirgüç-Kunt, 2008). Addressing this weakness, a wave of financial access surveys, known as the Finscope surveys, have been conducted across Sub-Saharan Africa since their launch in 2004 and this paper provides the latest estimates of formal banking penetration in eleven sub-Saharan African countries.[3]

By pooling eleven nationally representative Finscope surveys, we exploit commonalities in survey design to comprehensively examine the role of individual, geographic and

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[3] Formal banking penetration is defined as the percentage of individuals who have an account with a formal financial institution.

national characteristics in influencing the use of financial services in Sub-Saharan Africa.[4] This paper complements recent research conducted on Mexico and transition economies in Eastern Europe that has shed light on the characteristics of households with formal financial access (Djankov, Miranda, Seira and Sharma (2008) and Beck and Brown (2010)).

In the pooled dataset of eleven countries, we confirm that income and education are key demand side determinants of access to formal banking. We find that the more sophisticated an individual's financial sector knowledge the higher their likelihood of being formally banked and that trust in banks is associated with significantly higher chances of being formally banked. Geographical location also plays a role. We confirm the supply side constraint of location, as measured by the urban-rural divide or mobile phone usage, in determining the financial status of households in sub-Saharan Africa. However, although we maintain the view that distance to financial services is a central determinant of the usage of financial services in Africa, notwithstanding recent advances in mobile banking, the "time to grocery store" variable, another measure of distance to bank, is not significantly related to usage of financial services when country or district controls are included. While the role of gender is confirmed as an important correlate of financial access in summary statistics and univariate tests, it is revealing that when psychometric variables and education are controlled for, gender is not statistically significantly related to financial access.

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[4] The data for the paper come from the Finscope surveys and we include Botswana (2004), Kenya (2006), Malawi (2008), Mozambique (2009), Namibia (2004), Nigeria (2008), Rwanda (2008), South Africa (2006), Tanzania (2006), Uganda (2006) and Zambia (2005) in our analysis. The penetration rate for formal financial services is defined as the percentage of users in a given country.

This paper also contributes to the literature on the impact of access to financial services on individual level income at the micro level. We argue for the validity of trust in banks as an instrumental variable for the use of banking services and believe this approach contributes to the related literature. In our pooled dataset, we specifically find, using a unique instrumental variable, that usage of formal banking services increases an individual's monthly income by 1.67 percent, which in economic terms represents an increase of $1.41 in monthly income when evaluated at the mean.

The remainder of the paper is organised as follows. Section 2 provides an overview of related literature. In section 3 we discuss the data and the methodology. Section 4 presents and describes the results, while section 5 concludes.

2.   Literature Review

Accumulated evidence at the national level on penetration rates of formal finance has identified some of the main country characteristics that influence these penetration rates, and offered preliminary estimates of the magnitude of the effects (Honohan, 2008a,b). Mean income, the quality of national institutions, and indicators of geographic isolation, such as population density or mobile phone penetration, are strongly related to household financial penetration rates, with additional factors such as age distribution also playing a role.

At the household level, recent research documenting access to formal banking services in Mexico and transition economies has shed light on the characteristics of households with formal financial access. In their study of Mexican households using data collected by BANSEFI and the Mexican Ministry of Agriculture, Djankov, Miranda, Seira and

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Sharma (2008) find that households with bank accounts enjoy higher levels of consumption, possess greater assets and are more likely to be college educated. Beck and Brown (2010) use the European Bank for Reconstruction and Development's (EBRD) Life in Transition Survey (LITS) database to assess the correlates of access to formal banking services. At the household level, they find that the likelihood of holding a bank account or bank card increases with income, wealth and education in most transition countries. They also find evidence of a statistically significant role played by religion and minority status as well as the urban rural divide.

Economic theory suggests that financial development can have ambiguous outcomes for poverty and inequality reduction at the national level. The empirical evidence is, however, suggestive of the positive role played by financial development in reducing poverty and easing inequality. Beck, Demirgüç-Kunt, and Levine (2004) find that financial development reduces income inequality, while Honohan (2004) shows that financial depth helps explain the level of poverty as measured as the proportion of people with incomes of less than $1 or $2 a day.

At the household and individual level, economic theory suggests that access to financial services can contribute to poverty reduction. Access to finance should allow poor households to save, invest in the future in the form of physical and human capital and insure against income and health shocks. The most striking fact about the current state of knowledge is the disconnect between evidence on the effects of national financial depth (seen as an imperfect proxy for overall financial development) and the effects of household financial penetration (Beck, Demirgüç-Kunt and Honohan, 2009; Honohan, 2004; World Bank, 2008). Thus, although considerable evidence at both cross-country

and sectoral level confirms a causal role for financial sector development in contributing to economic growth and economic welfare – a confirmation not overturned by the recent severe collapses, following over-extension, in the financial systems of most advanced economies – surprisingly little evidence has so far been obtained to confirm a robust link at the micro level between financial penetration and the welfare of individuals and households. Many recent empirical studies have suggested a direct link between access to microfinance and welfare outcomes, but failed to adequately take into consideration selection bias in their econometric strategies. However, some recent research has pointed to a possible link. Addressing the issue of selection bias, Burgess and Pande (2005) find that rural branch expansion significantly reduces poverty at the household level by examining the state-led rural bank expansion in India between 1977 and 1990. In the area of microfinance, there is reason to believe that well-managed innovative community based financial products can lead to poverty reduction (Morduch and Hayley, 2002), although controversies remain.

3. Data and Methodology

A. Data

Our data come from the Finscope surveys that have been conducted between 2004 and 2009 in sub-Saharan Africa. The eleven surveys were carried out using broadly similar stratified multistage random sampling and the sample size varies from 1,200 in Botswana and Namibia to 21,110 in Nigeria, giving us a total of 55,762 individual observations.[5] Three of the more recent surveys from Malawi, Mozambique and Nigeria capitalised on

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[5] Other details of survey methodologies etc are well documented on the Finscope website http://www.finscope.co.za.

greater resources available to oversample rural areas and interview a broadly equal number of people in different districts, provinces and states respectively. These surveys as well as the remaining eight surveys include adult weights, and for the purpose of summary statistics we use these adult weights to transform the eleven datasets into nationally representative datasets. In addition, all regression analyses conducted in this paper, including the pooled regressions, take these weights into consideration.

The surveyed countries include some of the poorest in the world and it is not surprising that they display very low penetration of financial services. Previous survey estimates have put usage of formal financial services as low as 5 per cent in Tanzania, for example, although Finscope's more probing interviews lift this number somewhat (Honohan, 2008a). On the other hand, three of the countries in Southern Africa - Botswana, Namibia and South Africa - are middle-income countries with some of the highest mean incomes in Sub-Saharan Africa, although they are also countries with exceptionally high levels of inequality.

The Finscope surveys contain significant detail on an individual's awareness and usage of different financial products and service providers, and while the surveys collect details on some individual characteristics, unlike the Living Standards Measurement Survey (LSMS) they do not attempt to build a rounded profile of each household's economic activities. The questions asked are not exactly the same for each country, as is inevitable to some extent given the different product and provider ranges and cultural settings, but there is enough commonality between the surveys to allow quite a degree of cross-country comparison.

Finscope take a country specific approach to assessing whether an individual is formally, informally banked, or financially excluded. For each country, respondents are asked whether they currently use up to thirty different financial products. Although it is obvious for the vast majority of the financial products which are formal or informal, there may be a difference of opinion for some of the marginal cases. Appendix 1 details the financial products we consider as formal financial products. Two significant differences between this paper's approach and the official Finscope methodology are worthy of note. First, we have included a small number of additional products for Malawi, Namibia, Rwanda and Zambia to improve consistency in approach between the countries. Second, the absence of a published methodology for Mozambique, Tanzania and Uganda means that we was unable to compare the list of formal financial products used in this paper with the list used by Finscope.

Table A1 in the appendix provides the summary statistics and coding on how country level variables are turned into variables comparable across all eleven datasets. Although variables such as *age*, *urban*, *mobile (phone)* and *female* are instantly comparable across datasets, considerable work is required to ensure that *education*, *personal monthly income, financial sector knowledge*, *bank trust*, *risk aversion* and *time to grocery store* are comparable. Education is firstly standardised on a scale of 1-8 from "no formal education" up to "completed university education", but for the purposes of the multivariable regressions we derive four binary measures of education: less than primary education, completed primary education, completed secondary education and above secondary education.

The financial sector knowledge score is a normalised score (on a scale of 1-10) achieved in a financial sector knowledge quiz given during the interview. For nine countries a series of financial products/terms are mentioned and the individual receives two points for "I understand", one point for "I have heard of" and zero points for "never heard of/ don't understand". For example, in Namibia respondents are asked whether they understand or have heard of the sixteen financial terms/products: ATM, interest rates, bad debts, application process, bond/mortgage loan, credit bureau, credit record, the Bank of Namibia and eight others. No information on financial knowledge is available for Kenya while for Uganda, we were forced to rely on the response to the question, "What do we call an increase in prices?", as a proxy for financial knowledge. In this case, different scores are given for each of seventeen possible answers.

To support the analysis, we derive two important psychometric variables for each individual: risk aversion and trust in banks. For seven of the countries the measure of risk aversion is calculated using an individual's response to the question, "To get ahead in life, one needs to take some risks", but for three of the countries we have had to use more innovative approaches to ascertain the level of risk aversion at the individual level with varying degrees of success. For Tanzania, an individual is classified as being risk averse if they responded positively to having insurance or agreeing with the statement "I would like to have insurance but I cannot afford it". For Malawi and Rwanda, risk aversion is ascertained by the respondent mentioning over and above a threshold number of risks to their household. For nine of the countries the *banktrust* variable is determined by the question "I trust banks" or similar but in the case of Tanzania trust in banks is defined as a positive response to "Banks are my ideal financial service provider" or "I don't use

banks at the moment but would really like to" minus those who say that their lack of trust in banks is the reason they don't have a bank account or the reason they don't save with banks.

While the mobile banking revolution in Africa is reducing the need for large scale rural bank branch expansion to improve financial inclusion, distance or time to banking infrastructure is likely to continue to remain a significant barrier to multi-layered financial services for the rural poor. To capture this barrier accurately, data on distance or time to nearest bank branch would be ideal. Unfortunately, for the Finscope surveys data of this kind is only available for Kenya and Rwanda. Instead, for the remainder of the countries we rely on a time to grocery store variable as a proxy for distance to banking infrastructure. Tanzania is an exception where we use distance to where the respondent usually conducts their business transactions. Of course in remote rural areas in Africa, grocery stores are significantly more abundant than banking infrastructure and as a result it is important to consider our results with this distinction in mind.

Monthly personal income is mostly recorded in the Finscope surveys as a categorical variable with up to 20 possible bands, with the exception of Nigeria which records the exact income amount. For the purposes of the pooled dataset we have taken the midpoint of these categories and converted the amount into US dollars by the average exchange rate for the year of the survey.[6]

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[6] The exact approach taken and the exchange rates used are available for reference in Table A1. A significant number of observations are recorded as zero, which meant that when we used the natural log of income, we lost a number of observations. Assuming that these individuals truly had very low but nonzero income, to obtain the regression results reported, we have added $1 to every respondent's monthly income. Alternative approaches to this issue are undertaken in the robustness section.

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For most of the analyses in this paper Kenya drops out because Finscope Kenya does not have many of the variables of interest such as income, trust in banks, financial sector knowledge or risk aversion. The remainder of the pooled dataset has good coverage of the variables of interest with the exception of no observations for time to grocery store for Mozambique and Uganda, and an unorthodox approach to calculating personal income in Uganda that leads to 80 percent missing values.[7] Table A1 in the Appendix details the proportion of missing values for all observations.

In Table 1, we present the summary statistics of the percentage of adults with access to formal financial services in general and with various attributes for the eleven countries of interest. In addition, we graph the underlying distribution of four non-binary variables of interest: financial sector knowledge, education, the natural log of monthly income and time to store, for both the banked and unbanked populations (see figures 2-9).

At the country level, formal financial service penetration rates are higher in the relatively more affluent countries of South Africa (53.9 percent), Namibia (47.4 percent) and Botswana (43.4 percent) and lower in the poorer countries of Kenya (17.0 percent), Malawi (16.0 percent), Rwanda (15.3 percent), Tanzania (14.3 percent), Zambia (14.5 percent) and Mozambique (7.9 percent). The exception is Nigeria, which records a low financial sector penetration rate (21.1 percent) despite its relative affluence among sub-Saharan African peers. Figure 1 shows a graphical representation of this relationship

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[7] Ugandan respondents were asked for their exact household income from farming enterprises and other non-farming economic activities. This variable is for the entire household rather than the individual and there is a significant bias in responses towards agricultural households.

between mean income and financial penetration at the national level and highlights Nigeria's underperformance.[8]

Previous estimates of usage of formal financial services such as Honohan (2008a) use country level correlates to predict the level of financial penetration (based on equation 3.4 in Honohan (2008a)). In Table 2, we compare the Finscope estimates of formally banked with Honohan's (2008a) estimates of warranted penetration rates and the Mark IIIe estimates.[9] The Finscope surveys have raised the estimates of formally banked in Kenya, Namibia, Nigeria, South Africa and Uganda. As one might expect, the predicted (warranted) penetration rate using the fitted values for a country with the same GDP per capita, age dependency, ownership of mobile phones and quality of institutions index enjoys mixed success when compared with either the original Mark IIIe estimates or the Finscope estimates.

Table 1 shows that there are lower financial services penetration rates among the poorest individuals in sub-Saharan Africa, defined as those who earn less than $1 a day. The differences are particularly striking in countries with higher inequality such as South Africa, Botswana and Namibia. In Namibia for example, 60.3 percent of those earning above $1 per day have personal access to formal financial services, while only 14.5 percent of those earning less than $1 per day have access. Graphical inspection of the income distribution charts for the pooled banked and unbanked populations confirms the

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[8] Our average income figure for Uganda is likely to be biased downwards due to a bias towards agricultural income among respondents.

[9] The Mark IIIe dataset for financial access is reported in Honohan (2008a) and is based on the author's calculations as well as Beck et al. (2007b), Christen et al. (2004), Claessens (2006), European Commission (2005), Peachey and Roe (2006) and subsequent revisions. For definitions and method see Honohan (2008a).

country level results of Table 1. Figures 2 and 3 illustrate the income distribution for both the banked and unbanked subsamples in the pooled dataset.

The relationship between education and access to formal banking services is confirmed in Table 1 which provides the financial services penetration rates for those with above secondary education and those who did not complete primary education. Individuals with less than full primary education display very low levels of financial access, with the poorly educated in Kenya, Malawi, Mozambique, Nigeria, Rwanda, Tanzania and Zambia recording penetration rates between roughly 2 and 6 percent. In contrast, individuals with low levels of education in relatively more affluent countries, South Africa, Namibia and Botswana and display penetration rates of 28, 23 and 20 percent respectively, reflecting the greater depth in local financial infrastructure. The level of financial inclusion of lower education individuals in Uganda stands out for particular note at 20 percent. More generally, figures 4 and 5 graphically illustrate the underlying distributions of education level for the banked and unbanked populations for the pooled dataset and confirm our conclusion from the country level summary statistics.

In line with previous studies we also find that urban financial services penetration rates are considerably higher than those in rural areas. There is greater formal financial penetration among men than women for ten Sub-Saharan African countries, with the exception of Namibia, and the middle-aged tend to have slightly more usage than the youngest and oldest age categories, but the differences here are slight.

Figures 6 and 7 illustrate the clear differences in the distribution of financial sector knowledge between the banked and unbanked populations. The differences are less clear

for time to grocery store but the banked population are still more likely to experience a shorter time to store (see figures 8 and 9).

B.   Methodology

The first part of the analysis ascertains the determinants of access to formal financial services at the individual level. Following a series of univariate tests, we employ a multivariable probit model. The simplest model to assess the probability of a household or individual i in country n having an account (*Use=YES*) would be:

$$\Pr\{Use_{i,n} = YES_{i,n}\} = f(IND_{i,n}, GEO_{i,n}, NAT_n^f, NAT_n^{nf}) \qquad (1)$$

where $IND_{i,n}$ are characteristics of the individual respondent, $GEO_{i,n}$ are characteristics of that individual's local environment, NAT_n^f are country characteristics which are thought of as being subject to the influence of financial access policy and NAT_n^{nf} are other country characteristics or non-financial characteristics. Individual characteristics can be broken down into socioeconomic such as monthly income, education, financial sector knowledge, age, gender, and psychometric variables such as risk aversion and trust in banks. Individual level geographical variables include an urban dummy, time to grocery store (agnostic to the mode of transport) and whether an individual has a mobile phone or not. With ten countries in the pooled dataset, it was deemed prudent to use country controls or dummy variables rather than including a myriad of country level financial characteristics and other country level variables, an approach taken by Beck and Brown (2010).

In addition, to help control for unobserved regional heterogeneity and the related problem of omitted variables, a series of sub-national district controls are included. Specifically, we control for five Ugandan provinces, five Rwandan provinces, nine South African provinces, nine Zambian provinces, eleven Mozambique provinces, 13 regions in Namibia, 25 districts in Botswana, 26 regions in Tanzania, 30 districts in Malawi and 37 states in Nigeria.[10]

Reflecting the literature, we expect the demand side determinants such as income and education to have strong positive coefficients in the assessment of the determinants of personal financial access. The measure of financial sector knowledge, which is related to education level, is also likely to be significant and positively related to the likelihood of being formally banked. We expect that trust in banks will have a positive influence on being banked but are less certain on the relationship the measure of risk aversion will display.

In line with the findings of Beck and Brown (2010), we anticipate that the location of the respondent in relation to banking services (proxied by distance to the nearest grocery store) will be significantly and negatively related to the likelihood of being banked. The interpretation of the mobile phone coefficient is more complex. At least in the early stage of the roll-out of mobile telecommunications, possession of a mobile phone is likely to indicate proximity to services as well as individual wealth. As mobile phones increasingly reach rural areas, the ability to interpret the mobile dummy as a measure of

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[10] Attempts were made to conduct the analyses in this paper using controls at the electoral area (EA) or sub-location area. While there was evidence to suggest that the core results of this paper did not change, the approach was undermined by the fact that there were in fact 5,000 electoral areas for 50,000 observations with some electoral areas only having one or two observations.

proximity to services becomes less clear. However one decides to interpret the mobile phone variable, we consider it an important control variable.

In the second step of the analysis, we attempt to find a causal link between access to formal banking services and income. We model the determinants of monthly personal income using equation 2 as follows:

$$\text{Income} = f(Banked_{i,n}, IND_{i,n}, GEO_{i,n}, NAT_{i,n}) \qquad (2)$$

Instrumental Variables

There is reason to suspect that usage of financial services may not be exogenous, which could lead to misleading estimates. This suspicion is confirmed from the model of the determinants of usage of financial services in this paper. The channel whereby access to financial services influences income is at least as plausible as the likely mechanism whereby passing a threshold level of income opens up the opportunity for an individual to personally access formal banking services. If this is the case, reverse causality is likely to lead to inconsistent estimation of the role played by usage of financial services in determining income in the Ordinary Least Squares (OLS) regression.

An additional form of bias in OLS estimates can be caused when unobserved heterogeneity at the individual level such as ambition, ability or conscientiousness may make the individual more likely to simultaneously have a higher income and have a formal bank account. Such endogeneity may lead to an over estimation of the role played by formal banking in determining income in OLS estimates.

As the potential endogeneity of personal access to formal financial services brings into question the validity of the ordinary least squares estimates, we propose the use of trust in banks as an instrumental variable for bank use. Trust in banks has been suggested in the literature as a reason for exclusion from formal banking system (Bertrand, Mullainathan and Shafir, 2004). We expect the first stage regression to show that bank trust is significantly related to access to formal banking and that when we control for an individual's innate level of risk aversion, that trust in banks is not related to income level.

We must go further than proving the relevance of trust in banks as an instrumental variable and first argue that *banktrust* is not correlated with omitted variables (the source of the endogeneity); in essence that there is no covariance between *banktrust* and the error term in the second stage regression ($\text{Cov}\{\varepsilon, Z\} = 0$), and that there is sufficient exogenous variation in *banktrust*. We argue that the relationship between psychometric variables such as trust and attitudes to risk, and monthly income are complex and unlikely to exhibit any predictable relationship. When it comes to determining future monthly income, we argue that while trust in others, whether colleagues, customers or fellow villagers, is likely to have a positive influence on income at least outside of dysfunctional institutional environments, trust in banks is not likely to influence future income. If the decision to trust banks was related to a general preference to be risk averse, and risk aversion had a systematic relationship with income, then *banktrust* may not be a good instrument. However, as we include a measure for risk aversion in the model we can rule out this channel, at least as far as the measure of risk aversion captures the psychometric phenomenon of risk aversion.

Intuition would suggest that *banktrust* should be correlated with education level and level of financial sector knowledge, and this is confirmed in basic cross tabulations. In particular there is reason to believe that banktrust may be related to the level of annual banking transactions an individual engages in, although we do not have a measure of this. However, we argue that there is some exogenous element to bank trust that is independent of all potential correlates, emerging from an inner trustfulness to part with ones money that is sufficient, in the African context, to allow the use of trust in banks as an instrument. As a result, the instrumental variables strategy is supported by an attempt to control for as many potential correlates of *banktrust* as possible, including the use of a series of interaction terms.

The instrumental variable estimates allow us to test for the endogeneity of formally banked by comparing the coefficients between the OLS and instrumental variables (IV) estimators, otherwise known as the Hausman test. If we find a considerable difference in the coefficients then it was necessary to instrument in the first place to derive accurate estimates. We use a bootstrapped approach to calculating the Hausman test statistic because of the adherence to robust standard errors.

We remain open to the idea that an individual's education is in fact endogenous in the specification and we did attempt to use instrumental variables to overcome this problem. We investigated the use of time to grocery store as a potential instrument but in truth the nature of the datasets and the precise nature of the time to grocery store variable precludes an obvious instrument for education. Likewise financial sector knowledge may be considered endogenous to banking status and while an argument could be made that financial sector knowledge is endogenous to income, the endogeneity of this relationship

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is less obvious. In any case, we present the results with and without financial sector knowledge as a control variable.

4. Results

A. Determinants of Formally Banked

The results of univariate tests which compare the differences in means for the sub-samples of formally banked and non-formally banked respondents are reported in Table 3. This first step of the analysis confirms the predictions from the literature. First, in terms of measures of household location, we find that banked respondents are more likely to be urban dwellers, experience a shorter time to the local grocery store and have a mobile phone as the difference in the means of the two sub-samples for each of these variables are statistically significant at the 1 percent level. Gender differences are found in the two sub-samples as we find that men are more likely to have personal access to formal banking services.

In accordance with expectations, univariate tests find that the level of education, financial sector knowledge and monthly income are all higher for the formally banked sub-sample of the population. As for psychometric variables, the central prediction of lower trust in banks among the unbanked population is confirmed by the univariate tests. We also find that the unbanked population displays higher levels of risk aversion compared with those integrated into the formal banking system.

In the next step of the analysis, we investigate the determinants of the use of formal bank services more systematically using multivariable probit regressions and find some interesting correlation results. The results are presented in Table 4. The table reports the

marginal effects defined as the change in the probability of an individual making formal use of banking services for an infinitesimal change in each independent, continuous variable, and by default, the discrete change in the probability for dummy variables or other discrete variables. While we provide results of the model without country controls (columns 1, 4 and 7), greater emphasis is placed on the results with country controls (columns 2, 5and 8) and district controls (columns 3, 6 and 9). The more comprehensive the geographical controls are, the more unobserved regional heterogeneity is controlled for. Not only are the eleven countries in the dataset likely to be characterised by heterogeneous economic, financial and social circumstances, but different districts within each country are likely to exhibit different geographical and economic characteristics.

Reading from column 9, the importance of education and financial literacy is confirmed. It is found that those who have completed primary education increase their chances of being banked by 4 percent compared with the omitted category of less than primary education or illiteracy, and when those with completed secondary education (13 percent increase in the likelihood of being banked) and those with above second level education (43 percent increase in the likelihood of being banked) are considered the relationship strengthens. In similar fashion, increasing financial sector knowledge by one unit is associated with an increase in the likelihood of being formally banked by 3 percent.

It is found that a 1 percent increase in monthly personal income increases the chances of being banked by 3 percent, while having a mobile phone increases the probability of being banked by 12 percent. This result adds weight to the reasonable suspicion of potential two way causality between formally banked and income. Having trust in banks is associated with an 11 percent increase in the chances of being banked, a result that is

statistically significant with or without country controls and under different specifications of the model. It is found that risk aversion is inversely related to formally banked in the full specification with country controls but further country level analysis indicates that this result in the pooled dataset is largely driven by the Nigerian data.

While the role of gender is confirmed as an important correlate of personal financial access in summary statistics and univariate tests, it is revealing that when psychometric variables and financial sector knowledge are controlled for gender is not statistically significantly related to financial status. As indicated earlier, the time to grocery store variable may not be a perfect proxy for time to nearest bank branch and we find that the time to grocery store variable is not significantly related to financial status when country or district level controls are included. However, we do find that living in an urban environment increases the chances that an individual is formally banked.

The country level analysis confirms the pooled results but with some striking differences between countries (see Table 5). The extent of the role played by income level, education and financial sector knowledge varies by country. In Namibia, South Africa, Tanzania and Botswana we found that a 1 percent increase in monthly personal income is associated with increases in the chances of being banked by 14 percent, 11 percent 10 and 11 percent respectively compared with a less sizeable significant relationship in some of the poorer countries in the sample such as Mozambique, Zambia and Nigeria (which weighs down the result for the pooled estimates due to its significant sample size).

The results from the pooled regression in relation to education are broadly confirmed in the country level regressions, particular for the most educated groups. At lower levels of education the relationship with personal financial access loses statistical significance in countries such as Mozambique, Nigeria, South Africa, Tanzania, Uganda and Zambia. The location variables reveal some interesting results. Although the effect of having a mobile phone is uniformly positive for the majority of countries, the coefficients on time to store and the urban dummy reveal some points worthy of note. Mozambique, Nigeria, and Uganda are the only countries in the sample that record a positive and significant relationship between urban dwelling and formally banked. In Botswana the opposite result is achieved indicating that living in an urban environment means an individual is less likely to use formal banking services when all other variables are controlled for. The coefficient for time to grocery store remains insignificant for all countries when district controls are included.

The absence of a role for gender in determining financial access, when all other variables are included, can be seen in the majority of the country level regressions. However, in Nigeria and Uganda being female reduced the likelihood that an individual is formally banked, whereas in Rwanda the opposite is the case. In relation to trust in the financial system it is found that trust in banks increases the likelihood of being formally banked in all countries with the exception of Uganda and Zambia.[11]

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[11] The results do indicate a positive relationship between the two variables in Uganda and Zambia, but these coefficients are not statistically significant.

B. *Personal Financial Access and Income*

Although personal access to financial services is likely to have a slow-burning effect on an individual's welfare, nevertheless, it may be possible to detect such an effect in cross-sectional data, if access changes only gradually. Table 7 displays the results of the multivariable investigation into the causal relationship between personal financial access and personal income with the pooled dataset.

The ordinary least square estimates (columns 1-4) confirm the prior that having personal access to formal financial services is associated with higher income; estimated at approximately 1 percent higher income per month when either country or district controls are included. Having a mobile phone is both a proxy for location and income/wealth level and it is unsurprising that it is positively and significantly related to monthly personal income. It is found that being female is associated with a 39 percent lower monthly income (in column 4).

A number of less expected results are also present in the data. In line with recent concerns over returns to education in Africa, no statistically significant relationship between education level and income is found when country controls are concluded (Pritchett, 2001). However, when greater regional heterogeneity is controlled for the relationship between education and income is re-established. The results show that differences between countries in average education levels and average attitudes to risk are more important than levels of education and risk aversion at the individual level. The R-squared for the OLS models with country controls is 0.19, higher than the model without country controls.

The analysis shows that while time to grocery store does not play a statistically significant role in determining the likelihood that an individual is banked, it does play a statistically significant role in the determination of income. Specifically, it is found that at the 5 percent level of significance, time to grocery store is negatively related to income in the specification with district controls

The central challenge in assigning causation to access to financial services is the issue of endogeneity. In the methodology section the use of trust in banks as an instrumental variable in an exactly identified equation is proposed to overcome this issue.

Examining the relevance of trust in banks as an instrumental variable, the first stage regression shows that bank trust is statistically significantly related to personal access to financial services, across a range of specifications and with country and district fixed effects (see Table 6). We find that the Angrist-Pischke multivariate F-test of excluded instruments at 69.47 (prob > F = 0.00), is significantly higher than the general rule of thumb suggested by Staiger and Stock (1997) and the Stock and Yogo (2005) critical values for the specification that includes country controls and 159.76 for the model with district controls. As a result, we feel comfortable rejecting the null hypothesis of weak instruments in the pooled dataset.

The central results from the respective country level first stage regressions are presented at the bottom tables 8a and 8b. We find that bank trust is statistically significantly related to personal access to financial services for eight of the ten countries and that the Angrist-Pischke multivariate F-test of excluded instruments is greater than ten for all but three of the countries.

Making the case that *banktrust* only affects personal income through the use of banking services is more challenging. We argued in the previous section why we believe this to be the case and in the absence of any formal test of the validity of an instrument, we point to the absence of a relationship with *banktrust* in the multivariable OLS regression examining the determinants of income under any of the specifications, and irrespective of whether risk aversion is included in the model. [12]

The instrumental variable results for this specification are found in columns 5-8 in Table 7. A number of specifications with and without country fixed effects are presented and the results are consistent throughout. It is found that access to formal banking services increases an individual's monthly income by 1.67 percent on average, an economically more significant result than the ordinary least squares estimates suggested. Evaluated at the mean, 1.67 percent of monthly income represents $1.41.

Although we remain open to the critique that education is in fact endogenous to income and that the model may require re-specification, we have reason to believe that this is not a significant issue for the purposes of the empirical approach. First, the coefficient(s) on education, whether we use the one variable or the three dummy categories, is not significant in the country fixed effect ordinary least squares estimation. Second, when we omit education from this model very modest changes in the coefficient on formally banked are observed.

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[12] A series of reduced reform equations were estimated for increasing number of control variables, country and district fixed effects. We find that trust in banks does not have a statistically significant independent relationship with personal income once formally banked is included as an explanatory variable.

To enrich the analysis, the model for each individual country is estimated and table 8 presents the results. In South Africa, Namibia, Botswana, Malawi, Mozambique and Nigeria the positive role played by access to financial services in determining income is confirmed, noting in the case of the latter five countries the relationship becomes economically more significant when we use instrumental variables. Although in all countries we are able to find a correlation between the use of formal services and monthly income through the OLS specification, we are unable to find a relationship in the instrumental variable models for Rwanda, Tanzania, Uganda and Zambia suggesting considerable heterogeneity in national circumstances. Analysis of the respective first stage regressions helps explain these results. In countries where banktrust is statistically significantly related to personal access to financial services at the 1 percent level and the F-test for excluded instruments is greater than 30, the instrumental variables estimator produces statistically significant results.

There is also reason to believe that for Uganda this result can in part be attributed to the unorthodox approach to measuring income, whereas the nature of the *banktrust* variable for Tanzania may undermine the IV approach.

The higher IV estimates provide an insight into the nature of the endogeneity between banked and income level in this dataset. Endogeneity driven by unobservables such as ambition, ability or conscientiousness would have lead to an upward bias in the OLS estimates. The IV estimates suggest that this form is not the most significant source of endogeneity. Alternatively, reverse causality can be responsible for either an upward or downward bias in the OLS estimates, and may account for the higher coefficients achieved once formally banked is instrumented for using *banktrust*.

Alternatively, attenuation bias or regression dilution caused by measurement error in the formally banked variable could be responsible for the higher instrumental variables estimate of the relationship between banked in income. It could be plausibly argued that it is household level access to financial services that plays a role in determining income. For example, parental access to financial services can help maintain consistent investments in education that facilitate higher incomes for young adults. An even more reasonable explanation might come from the nature of inter-household transfers and borrowings which can help maintain the income levels of a particular individual in the household, through helping to overcome health or other income shocks, and prevent against costly divestment of productive assets.

The country specific regressions also highlight the different mechanisms at play in determining income across diverse countries in Africa particularly around the urban/rural divide. Urban dwellers are likely to have higher incomes in Namibia, Rwanda, South Africa and Tanzania, when all other variables are controlled for and district level controls are included. However the opposite is the case in Mozambique, Nigeria and Zambia. The binary variable for female behaves as expected in all countries but it is not significant in Namibia and Uganda.

C.   Robustness

To lend weight to the instrumental variables approach we formally test for endogeneity of personal financial access by comparing the coefficients between the OLS and IV estimators. We use a bootstrapped approach to calculating the Hausman test statistic because of the adherence to robust standard errors. If we find a considerable difference

in the coefficients then it was necessary to instrument in the first place to derive more consistent estimates. The test results indicate that there is reason to believe that the formally banked variable is endogenous to income. We strongly reject the null hypothesis of exogeneity when we instrument with *banktrust* and as a result the necessity of using instrumental variables is confirmed.

The comprehensiveness of the control variables helps provide the case for the independence of *banktrust* to the error term. To add further robustness to the analysis, a number of interaction terms were separately added to the model. For all combinations interaction terms for urban, female, education level, financial sector knowledge quartile and risk aversion, the coefficients on the instrumental variable regression are almost identical to the specification without interaction terms as reported in Table 7.

The analyses of the causal role played by access to formal banking services in determining personal income has been conducted with an important change to the income data. As noted previously, the reported results avoided technical problems of taking the natural log of a zero income by assuming that those households (10,632 in total and about 20 percent of the total pooled dataset) reporting zero income truly had very low but nonzero incomes, assumed to be \$1 per month. Although we stand by this approach, it may be open to challenge as it specifically changes relative income levels, particularly at low incomes. To help assuage concerns the investigation into personal income was performed under two alternative approaches; taking the natural log without adding the \$1 to monthly personal income and therefore losing 10,632 of the poorest individuals and using the transformation $x/(1+x)$ for an alternative scaling, an approach which produces more challenging coefficients for interpretation. The first approach produces a lower but

statistically significant coefficient at the 5 percent level for the same specification represented in column 9 of Table 7, confirming a causal relationship. However, this result must be seen within the context of the loss of information associated with excluding 10,632 of the poorest individuals from the dataset, and hence the likely underestimating of the magnitude of the relationship. The second approach produces coefficients for all equations implied in Table 7 that are strongly statistically significant and larger than the corresponding OLS estimates.

5.   Conclusion

The Finscope surveys greatly expand the information available on the use of financial services in sub-Saharan Africa, and provide a platform for increased research on financial access in some of the poorest countries in the world, a contribution that will only be strengthened when repeat surveys are completed.

In this paper, the importance of wider development efforts to the financial inclusion agenda is confirmed when it is found that income and education are key demand side determinants of access to formal banking. In the shorter term, some suggestive evidence is found that financial literacy programmes may be effective interventions for greater financial inclusion. Specifically, the results show that improving financial sector knowledge is associated with increases in the likelihood of being formally banked and developing trust in banks is related to a significant increase in the chances of being formally banked. As the expansion of mobile banking in Sub-Saharan Africa reaches more and more consumers, opportunities exist to overcome the dearth of bank branch infrastructure across the continent, but this will take time. In the mean time, the supply

side constraint of location is confirmed, as measured by the urban-rural divide, in determining the financial status of households in sub-Saharan Africa.

Using a novel instrument, attempts have been made to identify a causal role for the use of financial services by individuals in influencing income. In the pooled dataset of ten countries, using instrumental variables it is found that personal access to formal banking services increases individual monthly income by 1.67 percent, which in economic terms is significant. However, the pooled regression results mask significant heterogeneity at the country level.

To assist with the financial inclusion agenda, future research should continue attempts to identify, not only the magnitude of the effect of personal financial access on important socio-economic outcomes, but to decipher the relative importance of the different channels of causation at the individual and household level. In this paper an unprecedentedly large pooled dataset for eleven Sub-Saharan African countries has been capitalised on and it is expected that these efforts will be complemented with more experimental approaches to identifying the causal role played by financial access.

Nevertheless, there is more to be learned from the cross-country pooled datasets of this kind, notably on the use of different financial products, and on attitudes. However, it needs to be borne in mind that, in order to do justice to the complexity of the financial, economic and social systems in the different countries, and responding to a variety of stakeholders, the surveys display considerable variation in detail from country to country.

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Table 1: *Formal financial service penetration for individuals with various characteristics (% of surveyed adults in each category)*

	Botswana (2004)	Kenya[a] (2006)	Malawi (2008)	Mozambique (2009)	Namibia (2004)	Nigeria (2008)	Rwanda (2008)	South Africa (2006)	Tanzania (2006)	Uganda[a] (2006)	Zambia (2005)
Total	43.4	17.0	16.0	7.9	47.4	21.1	15.3	53.9	14.3	26.1	14.5
Region											
Urban	56.8	29.2	40.9	19.3	64.9	39.1	26.5	69.7	22.0	31.9	24.5
Rural	37.0	13.0	11.2	2.0	35.7	14.1	13.3	44.2	11.3	24.2	9.2
Gender											
Female	41.3	12.9	14.5	6.0	47.9	15.0	13.5	53.2	11.5	21.9	11.4
Male	45.9	21.3	17.7	10.1	46.9	26.7	17.7	54.5	17.4	30.7	17.5
Education											
Did not complete primary	22.9	5.6	4.2	5.7	19.6	2.2	4.5	27.5	6.3	20.0	1.8
More than completed secondary school	66.9	40.9	51.9	14.7	77.2	43.7	50.0	79.9	36.0	31.2	42.1
Income[b]											
Under $1 per day	16.7	N/A	4.2	3.2	14.5	13.2	9.8	20.2	6.3	N/A	8.7
Above $1 per day	64.5	N/A	31.4	11.3	60.3	31.8	35.8	65.2	19.4	N/A	20.3
Age											
60 +	37.9	15.0	10.2	6.6	44.0	20.9	10.9	41.5	12.3	16.8	15.8
50-59	45.1	22.5	16.2	8.1	49.8	22.3	15.1	61.2	11.9	27.9	26.2
40-49	46.1	21.1	17.5	8.6	53.6	25.7	18.4	58.4	20.1	27.4	27.3
30-49	54.2	21.0	19.4	8.9	57.9	23.3	20.0	66.0	14.9	32.1	22.5
16-29	38.0	12.1	14.9	7.3	40.6	17.9	10.2	46.0	13.1	24.6	8.0

[a] Income figures for Kenya not available and not sufficient coverage for Uganda.

[b] 30.4 days per month.

Table 2: Formal penetration rates: Estimated and warranted

	Mark IIIe estimate[a]	Warranted[b]	Over-performance[c]	Finscope Formally banked
Botswana	47.0	46.8	0.1	43.4
Ghana	16.2	26.0	-9.8	-
Kenya	10.0	14.8	-4.8	17.0
Lesotho	17.0	29.7	-12.7	-
Malawi	21.1	15.0	6.2	16.0
Mozambique	11.8	17.6	-5.8	7.9
Namibia	28.4	38.5	-10.2	47.8
Nigeria	14.8	11.0	3.8	21.1
Pakistan	12.2	21.3	-9.1	11.0
Rwanda	22.9	11.7	11.1	15.3
South Africa	46.0	51.1	-5.1	53.9
Swaziland	35.3	27.9	7.4	-
Tanzania	5.0	16.3	-11.3	14.3
Uganda	20.2	17.7	2.6	26.1
Zambia	15.4	17.2	-1.8	14.5

[a] Honohan (2008)a

[b]Fitted value from equation 3.4 in Honohan (2008a) showing expected penetration percentage for a country with the same GDP per capita, age dependency, ownership of mobile phones and quality of institutions index.

[c]Mark IIIe estimates minus warranted.

Table 3: Univariate Tests: Determinants of formally banked

	All Households	Banked		T-Statistic	Sample Test
		Yes	No		
Female	0.509	0.412	0.537	24.58	***
Mobile	0.350	0.753	0.238	-120.00	***
Urban	0.318	0.506	0.266	-51.61	***
BankTrust	0.396	0.724	0.303	-86.84	***
RiskAversion	0.322	0.259	0.334	16.15	***
FSKnow	3.719	6.058	3.047	-110.00	***
Time to Store	4.134	3.734	4.262	18.27	***
Educ	3.412	5.083	2.942	-130.00	***
LnIncome	3.652	4.722	3.304	-74.29	***

***, ** and * denote the significance level of the results of the linear independent sample tests. The sample tests are conducted on an unweighted pooled dataset.

	Table 4: Determinants of Formally Banked – Marginal Effects								
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
LnPerIncome	0.04***	0.03***	0.03***	0.04***	0.03***	0.03***	0.04***	0.03***	0.03***
	(0.004)	(0.009)	(0.002)	(0.005)	(0.008)	(0.002)	(0.005)	(0.007)	(0.002)
Primary_completed	0.09***	0.07***	0.06***	0.09***	0.06***	0.05***	0.08***	0.05**	0.04***
	(0.017)	(0.018)	(0.011)	(0.019)	(0.014)	(0.011)	(0.017)	(0.015)	(0.011)
Secondary_completed	0.22***	0.23***	0.21***	0.19***	0.17***	0.15***	0.17***	0.15***	0.13***
	(0.022)	(0.035)	(0.018)	(0.026)	(0.015)	(0.016)	(0.022)	(0.017)	(0.015)
Some_third_level	0.58***	0.63***	0.63***	0.51***	0.48***	0.47***	0.47***	0.44***	0.43***
	(0.028)	(0.064)	(0.030)	(0.031)	(0.029)	(0.027)	(0.029)	(0.030)	(0.026)
Age/100	0.93***	0.98***	0.90***	0.90***	0.99***	0.93***	0.90***	0.97***	0.91***
	(0.129)	(0.157)	(0.101)	(0.138)	(0.175)	(0.107)	(0.127)	(0.138)	(0.100)
Age/100_sq	-	-	-	-	-	-	-	-	-
	0.77***	0.85***	0.80***	0.68***	0.83***	0.80***	0.70***	0.83***	0.79***
	(0.142)	(0.210)	(0.120)	(0.148)	(0.233)	(0.126)	(0.138)	(0.177)	(0.116)
Female	-0.01	-0.03**	-0.03***	0.00	-0.01	-0.01*	0.00	-0.01	-0.01
	(0.007)	(0.008)	(0.005)	(0.007)	(0.007)	(0.005)	(0.007)	(0.007)	(0.005)
Mobile	0.20***	0.20***	0.18***	0.18***	0.15***	0.14***	0.16***	0.13***	0.12***
	(0.013)	(0.026)	(0.009)	(0.015)	(0.019)	(0.008)	(0.013)	(0.019)	(0.009)
urban	0.07***	0.07***	0.07***	0.05*	0.03**	0.03***	0.05*	0.03**	0.03***
	(0.017)	(0.013)	(0.008)	(0.023)	(0.011)	(0.008)	(0.021)	(0.009)	(0.008)
TimetoStore				0.01***	0.00	0.00	0.01**	0.00	0.00
				(0.003)	(0.002)	(0.002)	(0.003)	(0.001)	(0.002)
FSKnow				0.02***	0.04***	0.04***	0.02***	0.03***	0.03***
				(0.003)	(0.002)	(0.002)	(0.003)	(0.001)	(0.002)
BankTrust							0.14***	0.11***	0.11***
							(0.016)	(0.008)	(0.007)
RiskAversion							-0.02*	-0.02**	-0.02***
							(0.009)	(0.006)	(0.006)
Country Controls		Yes			Yes			Yes	
District Controls			Yes			Yes			Yes
Observations	43,788	43,788	43,774	36,759	36,759	36,747	36,062	36,062	36,050

Mozambique and Uganda are excluded when time to grocery store is included.

Country controls involve a series of country dummies and clustered standard errors at the country level.

District controls involve a series of district dummies and clustered standard errors at the district level.

Robust standard errors in parentheses.

*** p<0.001, ** p<0.01, * p<0.05

Table 5: Determinants of Formally Banked by Country - Marginal Effects									
VARIABLES	Botswana	Malawi	Mozambique	Namibia	Nigeria	Rwanda	S. Africa	Tanzania	Uganda	Zambia
LnPerIncome	0.10***	0.03***	0.01***	0.14***	0.01***	0.07***	0.11***	0.11***	0.08***	0.01***
	(0.011)	(0.004)	(0.002)	(0.035)	(0.001)	(0.007)	(0.011)	(0.011)	(0.022)	(0.002)
Primary_completed	0.22**	0.04***	0.00	0.21*	0.01	0.09***	0.05	0.05	-0.03	0.02
	(0.079)	(0.009)	(0.004)	(0.102)	(0.011)	(0.028)	(0.062)	(0.062)	(0.093)	(0.017)
Secondary_completed	0.23***	0.07***	-0.00	0.34***	0.08***	0.20**	0.18***	0.18***	0.32***	0.12**
	(0.071)	(0.021)	(0.005)	(0.098)	(0.015)	(0.073)	(0.035)	(0.035)	(0.059)	(0.038)
Some_third_level	0.51***	0.37***	0.00	0.37***	0.31***	0.13	0.34***	0.34***	0.34***	0.38***
	(0.079)	(0.102)	(0.006)	(0.101)	(0.026)	(0.149)	(0.055)	(0.055)	(0.040)	(0.076)
Age/100	2.66***	0.37	0.15***	1.70*	0.58***	0.81*	2.56***	2.56***	-0.04	0.88***
	(0.640)	(0.191)	(0.043)	(0.735)	(0.092)	(0.389)	(0.306)	(0.306)	(0.764)	(0.150)
Age/100_sq	-1.82*	-0.34	-0.12*	-1.38	-0.45***	-0.60	-2.88***	-2.88***	-0.10	-0.87***
	(0.788)	(0.223)	(0.052)	(0.884)	(0.095)	(0.465)	(0.430)	(0.430)	(0.798)	(0.178)
Female	0.07	-0.00	-0.00	0.04	-0.01*	0.03***	0.03	0.03	-0.08*	0.00
	(0.045)	(0.009)	(0.002)	(0.035)	(0.006)	(0.005)	(0.033)	(0.033)	(0.042)	(0.007)
Mobile	0.17***	0.08***	0.03***	0.06	0.11***	0.04	0.19***	0.19***	0.18***	0.02
	(0.049)	(0.012)	(0.009)	(0.053)	(0.009)	(0.035)	(0.057)	(0.057)	(0.039)	(0.016)
Urban	-0.27***	0.01	0.02***	0.08	0.03***	0.01	0.05	0.05	0.12***	0.01
	(0.050)	(0.027)	(0.005)	(0.046)	(0.007)	(0.030)	(0.062)	(0.062)	(0.015)	(0.010)
TimetoStore	0.00	-0.00	N/A	-0.02	0.00	-0.00	0.00	0.00	N/A	0.00
	(0.011)	(0.003)	N/A	(0.012)	(0.002)	(0.003)	(0.014)	(0.014)	N/A	(0.003)
FSKnow	0.10***	0.02***	0.01***	0.05***	0.02***	0.03**	0.06***	0.06***	0.00	0.01***
	(0.020)	(0.002)	(0.001)	(0.011)	(0.002)	(0.009)	(0.010)	(0.010)	(0.005)	(0.002)
BankTrust	0.27***	0.07***	0.06***	0.32***	0.08***	0.07***	0.27***	0.27***	0.02	0.04
	(0.065)	(0.015)	(0.008)	(0.043)	(0.008)	(0.012)	(0.041)	(0.041)	(0.038)	(0.020)
RiskAversion	-0.07	-0.01	0.00	0.10**	-0.02***	-0.02	-0.07	-0.07	-0.02	-0.02*
	(0.076)	(0.008)	(0.002)	(0.038)	(0.005)	(0.017)	(0.042)	(0.042)	(0.103)	(0.007)
District Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,007	3,964	3,728	993	21,109	1,809	2,773	2,773	580	2,511

District controls involve a series of district dummies and clustered standard errors at the district level.

Robust standard errors in parentheses.

*** p<0.001, ** p<0.01, * p<0.05

Table 6: First Stage Probit Regression				
VARIABLES	(1)	(2)	(3)	(4)
BankTrust	0.17***	0.14***	0.16***	0.12***
	(0.003)	(0.004)	(0.020)	(0.009)
Primary_completed	0.04***	0.03***	0.03	0.01
	(0.004)	(0.004)	(0.017)	(0.007)
Secondary_completed	0.14***	0.13***	0.14**	0.09***
	(0.005)	(0.006)	(0.030)	(0.011)
Some_third_level	0.47***	0.44***	0.47***	0.38***
	(0.006)	(0.008)	(0.051)	(0.015)
Age/100	1.02***	1.01***	1.01***	0.97***
	(0.051)	(0.057)	(0.145)	(0.093)
Age/100_sq	-0.87***	-0.84***	-0.91***	-0.85***
	(0.058)	(0.065)	(0.138)	(0.097)
Female	-0.02***	-0.01**	-0.02*	-0.01*
	(0.003)	(0.004)	(0.010)	(0.005)
Mobile	0.20***	0.17***	0.18***	0.13***
	(0.004)	(0.004)	(0.019)	(0.008)
Urban	0.05***	0.04***	0.05**	0.02**
	(0.004)	(0.004)	(0.010)	(0.009)
TimetoStore		0.00*		-0.00
		(0.001)		(0.002)
FSKnow		0.02***		0.04***
		(0.001)		(0.002)
RiskAversion		-0.01**		-0.01**
		(0.004)		(0.005)
Constant	-0.25***	-0.29***		
	(0.011)	(0.012)		
Country Controls			Yes	
District Controls				Yes
Observations	43,788	36,062	43,788	36,061
Adj. R-squared	.	.	.	.
Angrist-Pischke F-Stat	2490.66	1304.46	69.47	159.76

Country controls involve a series of country dummies and clustered standard errors.
District controls involve a series of district dummies and clustered standard errors at the district level.
Robust standard errors in parentheses
*** p<0.001, ** p<0.01, * p<0.05

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	OLS Estimates				IV: Trust in Banks			
Banked	1.27***	1.32***	1.04***	0.92***	1.65***	2.01***	1.92***	1.67***
	(0.027)	(0.031)	(0.160)	(0.066)	(0.114)	(0.164)	(0.298)	(0.357)
Primary_completed	0.11***	0.13***	0.10	0.22***	0.08***	0.09***	0.06	0.21***
	(0.020)	(0.025)	(0.147)	(0.054)	(0.023)	(0.028)	(0.123)	(0.054)
Secondary_completed	0.07*	0.16***	0.21	0.38***	-0.00	0.06	0.06	0.30***
	(0.028)	(0.034)	(0.150)	(0.075)	(0.034)	(0.041)	(0.103)	(0.083)
Some_third_level	0.19***	0.28***	0.46*	0.52***	-0.02	-0.04	-0.01	0.22
	(0.043)	(0.052)	(0.171)	(0.099)	(0.071)	(0.089)	(0.193)	(0.177)
Age/100	8.21***	9.08***	8.75***	9.52***	7.82***	8.39***	7.84***	8.79***
	(0.292)	(0.340)	(1.310)	(0.587)	(0.312)	(0.376)	(1.292)	(0.706)
Age/100_sq	-8.58***	-9.51***	-9.14***	-9.17***	-8.25***	-8.95***	-8.32***	-8.54***
	(0.335)	(0.390)	(1.508)	(0.606)	(0.344)	(0.407)	(1.501)	(0.691)
Female	-0.42***	-0.45***	-0.44***	-0.39***	-0.41***	-0.44***	-0.41***	-0.38***
	(0.018)	(0.021)	(0.091)	(0.047)	(0.018)	(0.021)	(0.082)	(0.047)
Mobile	0.30***	0.28***	0.32***	0.42***	0.22***	0.16***	0.14*	0.32***
	(0.022)	(0.026)	(0.058)	(0.037)	(0.033)	(0.039)	(0.064)	(0.061)
Urban	0.05*	-0.04	-0.06	-0.07	0.02	-0.08**	-0.12	-0.09
	(0.020)	(0.026)	(0.163)	(0.051)	(0.022)	(0.026)	(0.149)	(0.052)
TimetoStore		0.04***		-0.03*		0.03***		-0.02*
		(0.005)		(0.010)		(0.006)		(0.010)
FSKnow		-0.00		0.05***		-0.02***		0.02
		(0.005)		(0.010)		(0.006)		(0.017)
RiskAversion		0.21***		0.02		0.22***		0.03
		(0.023)		(0.041)		(0.024)		(0.041)
Constant	0.93***	0.57***	1.54***	0.69***	1.01***	0.78***		
	(0.060)	(0.072)	(0.317)	(0.136)	(0.066)	(0.087)		
Country Controls			Yes				Yes	
District Controls				Yes				Yes
Observations	43,788	36,062	43,788	36,062	43,788	36,062	43,788	36,061
R-squared	0.15	0.15	0.19	0.27	0.14	0.14	0.12	0.16
Adj. R-squared	0.15	0.15	0.19	0.27	0.14	0.14	0.12	0.15

Table 7: Natural Log of Personal Income and Use of Banked Services

Mozambique and Uganda are excluded when time to grocery store is included.

Country controls involve a series of country dummies and clustered standard errors.

District controls involve a series of district dummies and clustered standard errors at the district level.

Robust standard errors in parentheses.

*** p<0.001, ** p<0.01, * p<0.05

	Botswana		Malawi		Mozambique		Namibia		Nigeria	
VARIABLES	OLS	IV	OLS	IV	OLS	IV	OLS	IV	OLS	IV
Banked	1.72***	3.24**	0.66***	2.40***	0.47**	0.83***	1.28***	2.19***	0.75***	1.68**
	(0.228)	(0.998)	(0.081)	(0.576)	(0.128)	(0.240)	(0.206)	(0.506)	(0.074)	(0.580)
Primary_completed	0.26	0.01	0.35***	0.30***	-0.05	-0.05	0.00	-0.13	0.22*	0.24**
	(0.208)	(0.254)	(0.047)	(0.050)	(0.058)	(0.058)	(0.107)	(0.131)	(0.084)	(0.080)
Secondary_completed	0.48	0.18	0.43***	0.18	-0.01	-0.01	0.56**	0.30	0.32**	0.25*
	(0.274)	(0.347)	(0.106)	(0.134)	(0.112)	(0.105)	(0.131)	(0.165)	(0.112)	(0.117)
Some_third_level	1.63***	0.89	1.08***	0.32	-0.11	-0.10	1.35***	1.11***	0.42**	0.04
	(0.285)	(0.506)	(0.156)	(0.302)	(0.133)	(0.123)	(0.238)	(0.216)	(0.133)	(0.266)
Age/100	13.88***	10.14*	4.53***	3.28***	3.24***	3.04***	12.30***	9.88***	10.08***	9.37***
	(3.511)	(5.093)	(0.807)	(0.941)	(0.696)	(0.715)	(1.611)	(1.922)	(0.766)	(0.928)
Age/100_sq	-11.77**	-8.85	-5.55***	-4.34***	-3.39**	-3.20***	-10.27***	-8.09***	-9.78***	-9.19***
	(3.880)	(5.158)	(0.929)	(1.053)	(0.856)	(0.861)	(1.721)	(2.116)	(0.781)	(0.896)
Female	-0.26*	-0.25*	-0.13**	-0.15***	-0.15*	-0.15**	-0.16	-0.17	-0.51***	-0.48***
	(0.111)	(0.100)	(0.039)	(0.040)	(0.054)	(0.052)	(0.107)	(0.100)	(0.076)	(0.077)
Mobile	0.45*	0.19	0.55***	0.31**	0.24***	0.19***	0.18	0.09	0.48***	0.36***
	(0.160)	(0.254)	(0.058)	(0.094)	(0.036)	(0.039)	(0.127)	(0.136)	(0.055)	(0.081)
Urban	-0.07	0.23	0.26	0.19	-0.12	-0.13	0.21	0.12	-0.07	-0.11
	(0.256)	(0.223)	(0.201)	(0.207)	(0.070)	(0.069)	(0.148)	(0.135)	(0.061)	(0.066)
TimetoStore	0.02	0.01	-0.06***	-0.05***	N/A	N/A	0.04	0.06	-0.01	-0.01
	(0.036)	(0.036)	(0.014)	(0.014)	N/A	N/A	(0.025)	(0.032)	(0.021)	(0.020)
FSKnow	0.23***	0.10	0.10***	0.03	0.12***	0.10***	0.07**	0.03	0.04*	-0.01
	(0.053)	(0.100)	(0.015)	(0.024)	(0.018)	(0.022)	(0.018)	(0.030)	(0.015)	(0.028)
RiskAversion	0.19	0.23	0.00	0.02	-0.08	-0.08	0.02	-0.03	0.05	0.07
	(0.135)	(0.171)	(0.057)	(0.053)	(0.105)	(0.101)	(0.110)	(0.125)	(0.073)	(0.074)
Constant	-0.72		1.40***		2.09***		-0.09		0.64**	
	(0.720)		(0.282)		(0.144)		(0.411)		(0.200)	
District Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,019	1,018	3,964	3,964	3,728	3,728	993	993	21,109	21,109
R-squared	0.53	0.39	0.32	0.14	0.25	0.17	0.47	0.38	0.20	0.13
Adj. R-squared	0.51	0.36	0.32	0.13	0.25	0.16	0.46	0.36	0.20	0.13
First Stage				***		***		***		***
Banktrust is significant		***								
Angrist-Pischke F-Stat		35.78		19.83		171.78		35.22		85.14

Table 8a: Natural Log of Personal Income and Use of Banked Services by Country

Robust standard errors in parentheses.

District controls involve a series of district dummies and clustered standard errors at the district level.

*** p<0.001, ** p<0.01, * p<0.05

	Rwanda		S. Africa		Tanzania		Uganda		Zambia	
VARIABLES	OLS	IV	OLS	IV	OLS	IV	OLS	IV	OLS	IV
Banked	0.79***	0.52	1.64***	1.46**	0.39***	2.51	0.31*	2.35	0.41*	1.95
	(0.040)	(0.583)	(0.181)	(0.543)	(0.069)	(1.911)	(0.078)	(4.020)	(0.149)	(1.562)
Primary_completed	0.17*	0.20*	-0.38*	-0.36*	0.22*	0.35*	0.20*	0.18	0.39*	0.38*
	(0.044)	(0.086)	(0.165)	(0.165)	(0.081)	(0.154)	(0.070)	(0.190)	(0.167)	(0.158)
Secondary_completed	0.62*	0.70***	0.07	0.12	0.29**	0.09	0.20	-0.45	0.50	0.35
	(0.143)	(0.117)	(0.163)	(0.198)	(0.100)	(0.209)	(0.151)	(1.374)	(0.219)	(0.190)
Some_third_level	0.71***	0.81***	0.90**	0.97**	0.74***	0.23	0.93**	0.23	0.17	-0.65
	(0.050)	(0.225)	(0.264)	(0.311)	(0.084)	(0.491)	(0.196)	(1.301)	(0.388)	(0.751)
Age/100	3.45*	3.83**	9.65***	9.98***	1.33	0.59	1.28	0.78	20.43**	18.77***
	(0.865)	(1.386)	(1.212)	(1.120)	(0.749)	(1.032)	(1.024)	(2.040)	(4.117)	(5.076)
Age/100_sq	-4.05**	-4.38***	-6.79***	-7.06***	-1.45	-1.01	-1.40	-0.53	-21.99**	-20.39***
	(0.821)	(1.188)	(1.312)	(1.134)	(0.793)	(1.001)	(1.037)	(2.228)	(4.889)	(5.689)
Female	-0.25**	-0.25***	-0.51***	-0.51***	-0.29***	-0.22	-0.09	0.02	-0.29**	-0.28***
	(0.048)	(0.044)	(0.077)	(0.074)	(0.065)	(0.112)	(0.063)	(0.224)	(0.069)	(0.053)
Mobile	0.44**	0.48**	0.65***	0.69***	0.36***	-0.03	0.40**	0.02	0.01	-0.10
	(0.086)	(0.158)	(0.106)	(0.203)	(0.071)	(0.352)	(0.079)	(0.686)	(0.124)	(0.169)
Urban	0.19*	0.21***	0.28	0.29	0.18**	0.21*	-0.05	-0.21	-0.46	-0.43*
	(0.053)	(0.056)	(0.193)	(0.167)	(0.059)	(0.098)	(0.070)	(0.321)	(0.207)	(0.214)
TimetoStore	-0.04	-0.05*	-0.03	-0.03	0.02	0.01	N/A	N/A	-0.01	-0.02
	(0.022)	(0.022)	(0.033)	(0.033)	(0.010)	(0.015)	N/A	N/A	(0.030)	(0.022)
FSKnow	0.11**	0.12**	0.06*	0.07*	0.06***	-0.03	0.01	-0.01	0.11*	0.08
	(0.022)	(0.043)	(0.026)	(0.030)	(0.011)	(0.082)	(0.015)	(0.019)	(0.033)	(0.054)
RiskAversion	0.07	0.06	0.07	0.06	-0.11	-0.13	0.01	-0.02	-0.28*	-0.23*
	(0.074)	(0.066)	(0.078)	(0.083)	(0.077)	(0.080)	(0.113)	(0.309)	(0.098)	(0.106)
Constant	0.94*		0.25		1.95***		3.25***		-1.69*	
	(0.207)		(0.414)		(0.174)		(0.209)		(0.718)	
District Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,809	1,809	2,773	2,773	1,884	1,884	582	582	2,511	2,511
R-squared	0.39	0.31	0.38	0.37	0.31	-0.36	0.23	-0.58	0.19	0.14
Adj. R-squared	0.38	0.31	0.37	0.36	0.30	-0.39	0.21	-0.62	0.18	0.13
First Stage										
Banktrust is significant		*		***		No		No		*
Angrist-Pischke F-Stat		11.85		51.19		2.49		1.11		6.53

Table 8b: Natural Log of Personal Income and Use of Banked Services by Country

Robust standard errors in parentheses.

District controls involve a series of district dummies and clustered standard errors at the district level.

*** $p<0.001$, ** $p<0.01$, * $p<0.05$

Figure 1: *Mean income and % with bank account in Finscope surveys*
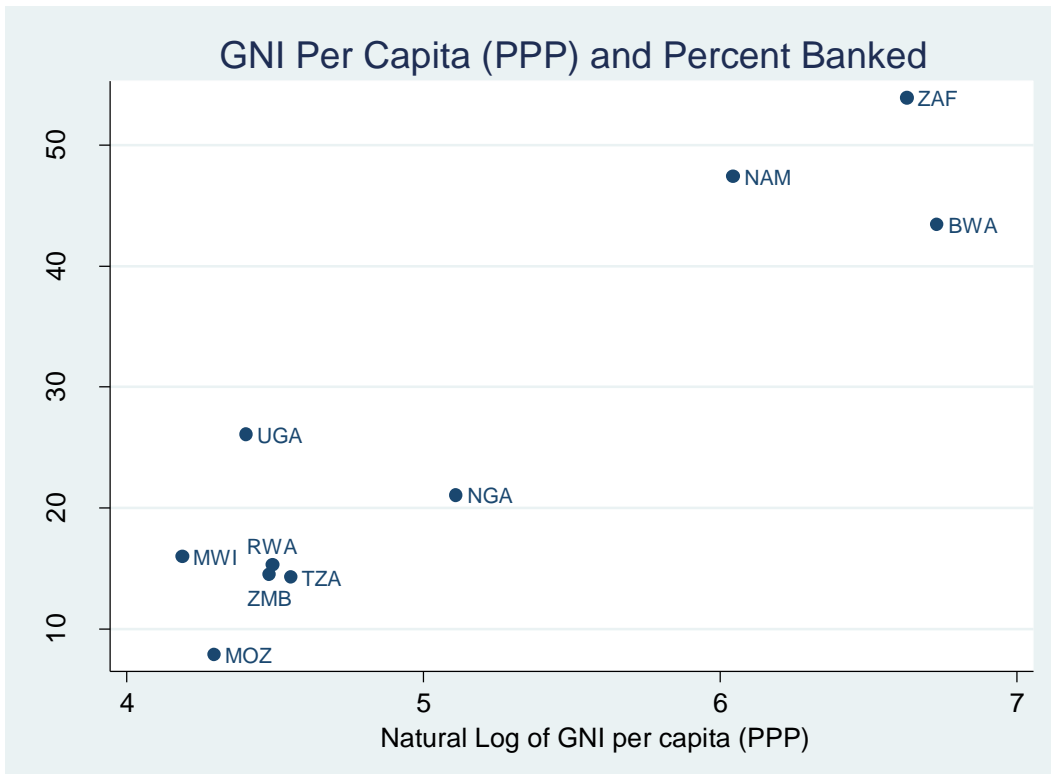
Sources: FinScope Surveys and World Bank (2012).

Figure 2: *Distribution of Natural Log of Income, Formally Banked Population*
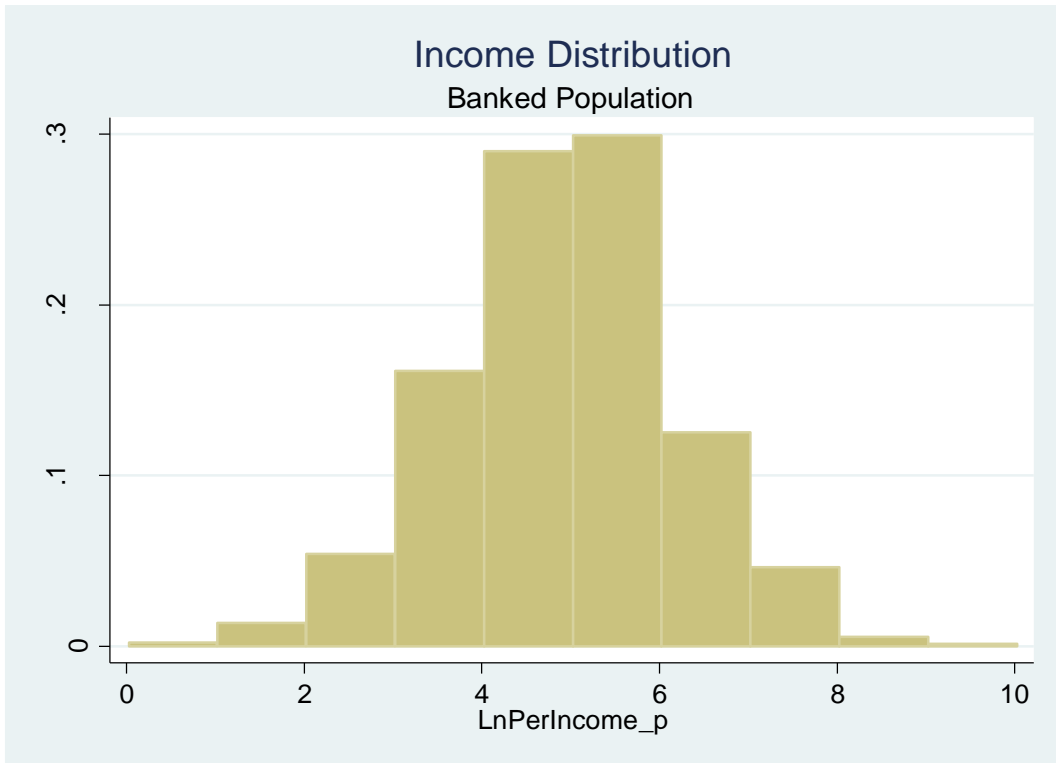
Figure 3: *Distribution of Natural Log of Income, Unbanked Population*
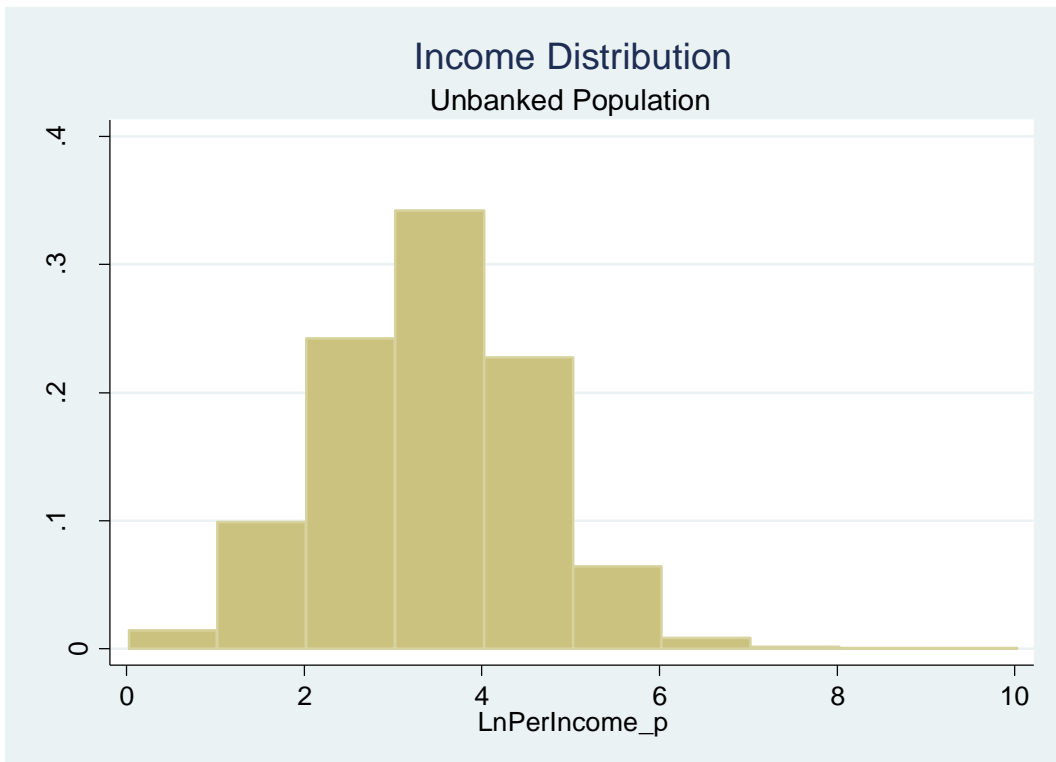
Figure 4: *Distribution of Education Levels, Formally Banked Population*
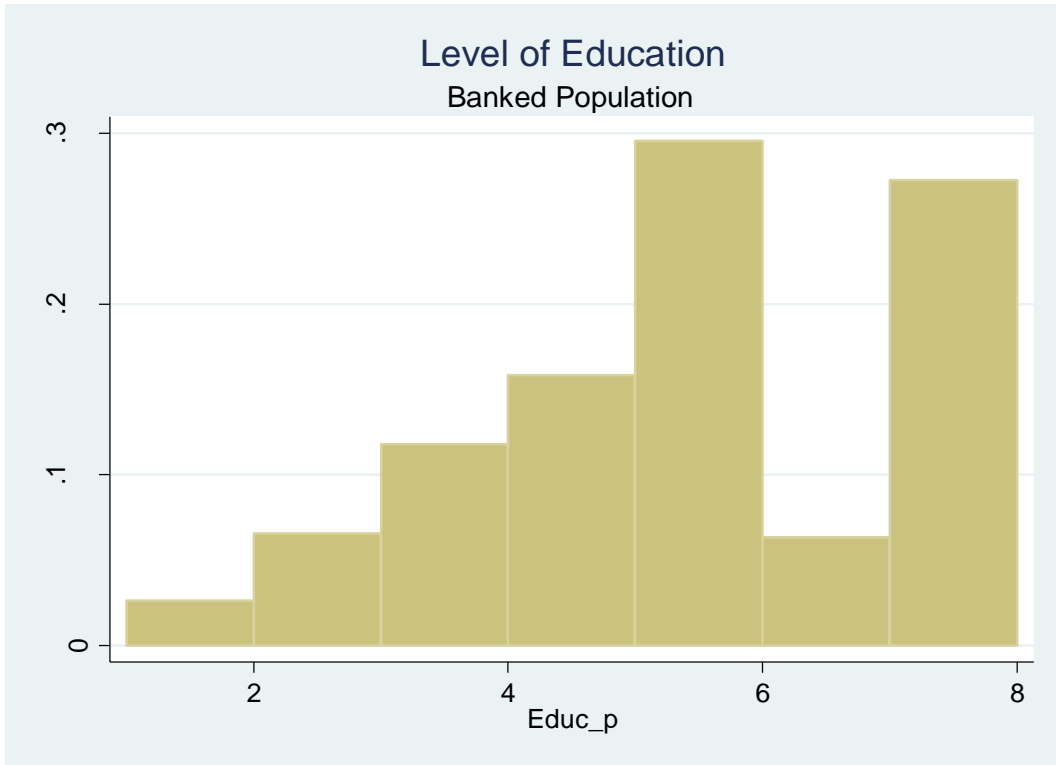
Figure 5: *Distribution of Natural Log of Income, Unbanked Population*

Figure 6: *Distribution of Financial Sector Knowledge, Formally Banked Population*

Financial Sector Knowledge
Banked Population

Figure 7: *Distribution of Financial Sector Knowledge, Unbanked Population*

Financial Sector Knowledge
Unbanked Population

Figure 8: *Distribution of Time to Grocery Store, Formally Banked Population*

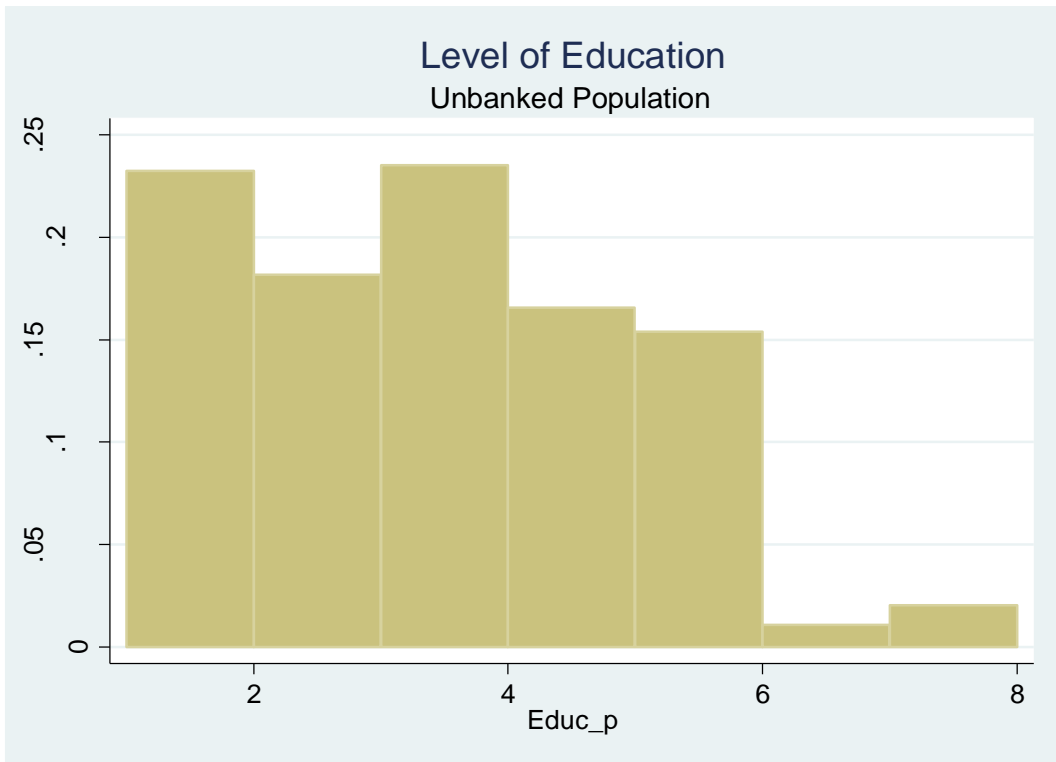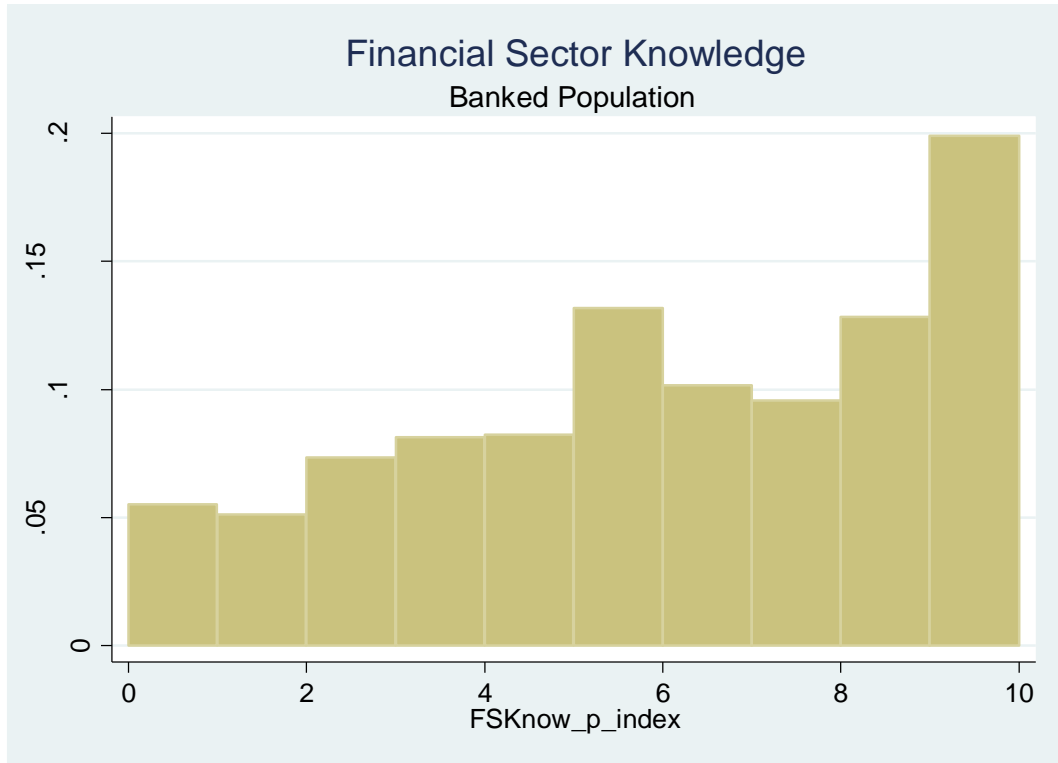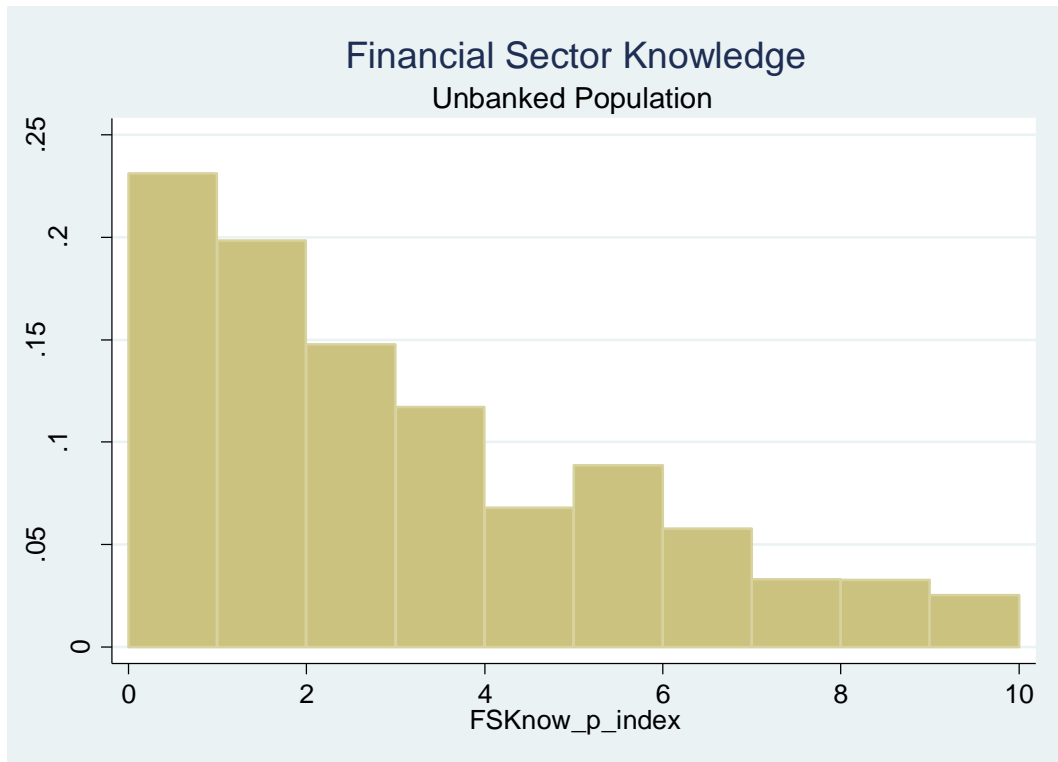Figure 9: *Distribution of Time to Grocery Store, Unbanked Population*

					% of		**Std.**		
Variable	**Country**	**Year**	**Coding**	**Obs**	**Total**	**Mean**	**Dev.**	**Min**	**Max**

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Table A1: Data Appendix

Weighted means for these countries are in parentheses.

</div>

Variable	Country	Year	Coding	Obs	% of Total	Mean	Std. Dev.	Min	Max
Age	Botswana	2004	Exact age.	1,200	100.00	35.09 (36.73)	15.15	18	87
Age	Kenya	2006	Exact age.	4,418	100.00	36.48 (36.69)	15.54	16	90
Age	Malawi	2008	Exact age.	4,957	99.28	36.01 (36.10)	14.87	18	93
Age	Mozambique	2009	Exact age.	5,028	100.00	34.60 (34.65)	15.17	16	94
Age	Namibia	2004	Exact age.	1,193	99.42	34.70 (34.30)	15.13	16	85
Age	Nigeria	2008	Exact age.	21,110	100.00	36.14 (35.62)	14.54	18	99
Age	Rwanda	2008	Exact age.	2,000	100.00	37.87 (38.23)	15.75	18	91
Age	South Africa	2006	Exact age.	3,883	99.72	39.19 (37.57)	15.86	16	92
Age	Tanzania	2006	Exact age.	4,959	99.94	35.36 (35.19)	15.22	16	99
Age	Uganda	2006	Exact age.	2,801	94.66	35.40 (35.47)	14.70	18	95
Age	Zambia	2005	Exact age.	3,990	99.80	30.42 (30.17)	12.49	16	89
Bank Trust	Botswana	2004	Agree with the statement "I trust Banks".	1,200	100.00	0.48 (0.47)	0.50	0	1
Bank Trust	Kenya	2006	NA	NA	NA	NA	NA	NA	NA
Bank Trust	Malawi	2008	Agree with the statement "I trust Banks".	4,993	100.00	0.23 (0.23)	0.42	0	1
Bank Trust	Mozambique	2009	Agree with the statement "Banks can be trusted".	5,028	100.00	0.13 (0.10)	0.34	0	1
Bank Trust	Namibia	2004	Agree with the statement "I trust Banks".	1,200	100.00	0.35 (0.37)	0.48	0	1
Bank Trust	Nigeria	2008	Agree with the statement "I trust Banks in general".	21,110	100.00	0.34 (0.36)	0.47	0	1
Bank Trust	Rwanda	2008	Agree with the statement "I would trust banks with my money".	2,000	100.00	0.81 (0.81)	0.39	0	1
Bank Trust	South Africa	2006	Agree with the statement "I trust Banks".	3,894	100.00	0.61 (0.58)	0.49	0	1
Bank Trust	Tanzania	2006	Trust in banks is defined as "Banks are my ideal financial service provider" and "I don't use banks at the moment but would really like to." minus those who say that their lack of trust in banks is the reason they don't have a bank account or the reason they don't save with banks.	4,962	100.00	0.64 (0.61)	0.48	0	1
Bank Trust	Uganda	2006	Agree with the statement "I trust formal commercial banks."	2,959	100.00	0.57 (0.57)	0.49	0	1
Bank Trust	Zambia	2005	Agree with the statement "I trust Banks".	3,998	100.00	0.38 (0.38)	0.49	0	1

Variable	Country	Year	Coding	Obs	% of Total	Mean	Std. Dev.	Min	Max
Educ	Botswana	2004	1 = No formal education, 2 = Some primary school, 3 = Primary school completed, 4 = Some high school, 5 = High school completed, 6 = Any other post-matric qualification not university, 7 = Some university, 8 = University completed.	1,200	100.00	3.92 (3.83)	1.90	1	8
Educ	Kenya	2006	1= None, 2 = Some primary (class 1-5), 3 = Primary completed (class 6-7), 4 = Some secondary (class 8-10), 5 = Secondary completed (class 11-12), 6 = Technical training after secondary, 8 = University.	4,402	99.64	3.14 (3.14)	1.70	1	8
Educ	Malawi	2008	1 = No formal education, 2 = Primary Standard 1-5, 3 = Primary Standard 6-8, 4 = Secondary 1-2, 5 = Secondary 3-4, 7 = Vocational training Institute, 8 = University/ Other higher education.	4,931	98.76	2.87 (2.78)	1.52	1	8
Educ	Mozambique	2009	1= None, 2 = Some primary, 3 = Primary completed/Literate, 4 = Some secondary, 5 = Secondary completed, 6 = Technical training, 8 = University.	5,028	100.00	2.73 (2.67)	1.29	1	8
Educ	Namibia	2004	1 = No formal education, 2 = Incomplete Primary School, 3 = Primary School (completed), 4 = Incomplete Secondary School, 5 = complete secondary school, 7 = Incomplete Tertiary Level, 8 = Tertiary level (completed).	1,197	99.75	3.76 (3.84)	1.59	1	8
Educ	Nigeria	2008	1 = Illiterate/None, 2= Primary Incomplete, 3 = Primary completed, 4 = Secondary incomplete, 5 = Secondary complete, 7 = University/Polytechnic OND, 8 = University/Polytechnic HND 8 = Post-University incomplete, 8 = Post-University complete.	21,110	100.00	3.61 (3.80)	2.14	1	8
Educ	Rwanda	2008	1 = No formal education, 2 = Primary grade A, 3 = Primary grade B, 4 = Secondary 1-3, 5 = Secondary 4-6, 6 = Vocational training, 7 = University or other higher education.	2,000	100.00	2.53 (2.50)	1.29	1	7
Educ	South Africa	2006	1 = No formal education, 2 = Some primary school, 3 = Primary school completed, 4 = Some high school, 5 = Matriculated, 6 = Any other post-matric qualification, Some technical training, e.g. carpentry, motor mechanics, Credits from a technikon or other tertiary education, Completed apprenticeship/technical training, e.g. carpentry, motor mechanics, 7 = Some university, 8 = University completed.	3,894	100.00	4.34 (4.14)	1.52	1	8
Educ	Tanzania	2006	1 = No formal schooling, 2 = Pre-primary, 3 = Primary, 4 = Post primary training, 5 = Secondary, 6 = Post secondary training, 8 = University.	4,844	97.62	3.28 (2.95)	1.50	1	8
Educ	Uganda	2006	1 = Did not complete P1, 2 = Completed P1, P2, P3, P4, P5, P6, 3 = Completed P7, 4 = Completed S1, S2, S3, S4, S5, 5 = Completed S6, 6 = Specialised training or certificate, Specialised training or diploma, 8 = Completed degree and above.	2,485	83.98	3.17 (3.15)	1.45	1	8
Educ	Zambia	2005	1 = No formal education, 2 = Some primary school, 3 = Primary school completed, 4 = Some secondary school, 5 = Secondary school completed, 6 = Professional Qualification or equivalent, 7 = Some College, Some College completed, Some University, 8 = University Completed.	3,986	99.70	3.76 (3.80)	1.77	1	8

Variable	Country	Year	Coding	Obs	% of Total	Mean	Std. Dev.	Min	Max
FSKnow	Botswana	2004	Normalised score achieved in financial sector knowledge quiz. Heard of 14 Banks and understand 6 types of financial Institution; 2 points for "understand", 1 point for "heard of", 0 for "never heard of/ don't understand".	1,200	100.00	2.41 (2.36)	1.56	0	10
FSKnow	Kenya	2006	NA	NA	NA	NA	NA	NA	NA
FSKnow	Malawi	2008	Normalised score achieved financial sector knowledge quiz. Q: 20 different financial products/terms mentioned; 2 points for "understand", 1 point for "heard of", 0 for "never heard of/ don't understand".	4,529	90.71	2.29 (2.11)	2.79	0	10
FSKnow	Mozambique	2009	Normalised score achieved financial sector knowledge quiz. Q: 20 different financial products/terms mentioned; 2 points for "understand", 1 point for "heard of", 0 for "never heard of/ don't understand".	5,028	100.00	3.03 (2.72)	2.39	0	10
FSKnow	Namibia	2004	Normalised score achieved financial sector knowledge quiz. Q: 16 different financial products/terms mentioned; 2 points for "understand", 1 point for "heard of", 0 for "never heard of/ don't understand".	1,200	100.00	2.53 (2.62)	2.56	0	10
FSKnow	Nigeria	2008	Normalised score achieved financial sector knowledge quiz. Q: 33 different financial products/terms mentioned; 2 points for "understand", 1 point for "heard of", 0 for "never heard of/ don't understand".	21,109	100.00	3.59 (3.76)	2.78	0	10
FSKnow	Rwanda	2008	Normalised score achieved financial sector knowledge quiz. Q: 17 different financial products/terms mentioned; 2 points for "understand", 1 point for "heard of", 0 for "never heard of/ don't understand".	2,000	100.00	5.74 (5.79)	1.84	0.31	10
FSKnow	South Africa	2006	Normalised score achieved financial sector knowledge quiz. Q: 16 different financial products/terms mentioned; 2 points for "understand", 1 point for "heard of", 0 for "never heard of/ don't understand".	3,894	100.00	3.76 (3.06)	2.66	0	10
FSKnow	Tanzania	2006	Normalised score achieved financial sector knowledge quiz. Q: 9 different financial products mentioned; 2 points for "understand", 1 point for "heard of", 0 for "never heard of/ don't understand".	4,962	100.00	5.04 (4.55)	2.83	0	10
FSKnow	Uganda	2006	Answer to Question on Inflation Increase in prices - what is it called? Answers and scores: Inflation = 20, Cost of living = 16, Consumer Price Index = 16, Scarcity = 14, Price fluctuation = 12, Tax = 10, Poor Financial management = 8, Price legislation = 6, Development = 6, Budget = 4, Removal of graduated tax = 2, Interest = 2, Population increase = 2, Corruption = 2, Privatization = 2, Third term = 0, Don't know = 0.	2,959	100.00	4.25 (4.04)	3.82	0	10
FSKnow	Zambia	2005	Normalised score achieved financial sector knowledge quiz. Q: 28 different financial products/terms mentioned; 2 points for "understand", 1 point for "heard of", 0 for "never heard of/ don't understand".	3,628	90.75	4.62 (4.68)	2.91	0	10

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Variable	Country	Year	Coding	Obs	% of Total	Mean	Std. Dev.	Min	Max
Female	Botswana	2004	Female = 1, Male = 0.	1,200	100.00	0.51 (0.53)	0.50	0	1
Female	Kenya	2006	Female = 1, Male = 0.	4,418	100.00	0.56 (51.69)	0.50	0	1
Female	Malawi	2008	Female = 1, Male = 0.	4,993	100.00	0.52 (0.52)	0.50	0	1
Female	Mozambique	2009	Female = 1, Male = 0.	5,028	100.00	0.57 (0.55)	0.49	0	1
Female	Namibia	2004	Female = 1, Male = 0.	1,200	100.00	0.50 (0.49)	0.50	0	1
Female	Nigeria	2008	Female = 1, Male = 0.	21,110	100.00	0.48 (0.48)	0.50	0	1
Female	Rwanda	2008	Female = 1, Male = 0.	2,000	100.00	0.64 (0.57)	0.48	0	1
Female	South Africa	2006	Female = 1, Male = 0.	3,894	100.00	0.50 (0.50)	0.50	0	1
Female	Tanzania	2006	Female = 1, Male = 0.	4,962	100.00	0.47 (0.52)	0.50	0	1
Female	Uganda	2006	Female = 1, Male = 0.	2,959	100.00	0.52 (0.53)	0.50	0	1
Female	Zambia	2005	Female = 1, Male = 0.	3,998	100.00	0.50 (0.49)	0.50	0	1
Banked	Botswana	2004	Formally Banked = 1, Unbanked =0. See Appendix A2 for details.	1,200	100.00	0.43 (0.43)	0.50	0	1
Banked	Kenya	2006	Formally Banked = 1, Unbanked =0. See Appendix A2 for details.	4,418	100.00	0.18 (0.17)	0.39	0	1
Banked	Malawi	2008	Formally Banked = 1, Unbanked =0. See Appendix A2 for details.	4,993	100.00	0.16 (0.16)	0.37	0	1
Banked	Mozambique	2009	Formally Banked = 1, Unbanked =0. See Appendix A2 for details.	5.028	100.00	0.10 (0.08)	0.31	0	1
Banked	Namibia	2004	Formally Banked = 1, Unbanked =0. See Appendix A2 for details.	1,200	100.00	0.45 (0.4743)	0.50	0	1
Banked	Nigeria	2008	Formally Banked = 1, Unbanked =0. See Appendix A2 for details.	21,110	100.00	0.20 (0.21)	0.40	0	1
Banked	Rwanda	2008	Formally Banked = 1, Unbanked =0. See Appendix A2 for details.	2,000	100.00	0.15 (0.15)	0.36	0	1
Banked	South Africa	2006	Formally Banked = 1, Unbanked =0. See Appendix A2 for details.	3,894	100.00	0.62 (0.54)	0.48	0	1
Banked	Tanzania	2006	Formally Banked = 1, Unbanked =0. See Appendix A2 for details.	4,962	100.00	0.16 (0.1432)	0.37	0	1
Banked	Uganda	2006	Formally Banked = 1, Unbanked =0. See Appendix A2 for details.	2,959	100.00	0.26 (0.26)	0.49	0	1
Banked	Zambia	2005	Formally Banked = 1, Unbanked =0. See Appendix A2 for details.	3,998	100.00	0.15 (0.14)	0.35	0	1

Variable	Country	Year	Coding	Obs	% of Total	Mean	Std. Dev.	Min	Max
LnIncome	Botswana	2004	Natural log of midpoint of personal monthly l income, recorded as a categorical variable and translated into US dollars with exchange rate 0.2066. Please note that $1 has been added before the log transformation.	1,023	85.25	3.50 (3.53)	2.43	0	8.44
LnIncome	Kenya	2006	NA	NA	NA	NA	NA	NA	NA
LnIncome	Malawi	2008	Natural log of midpoint of personal monthly income, recorded as a categorical variable and translated into US dollars with exchange rate 0.00724. Please note that $1 has been added before the log transformation.	4,650	93.13	3.22 (3.17)	1.59	0	9.45
LnIncome	Mozambique	2009	Natural log of midpoint of personal monthly income, recorded as a categorical variable and translated into US dollars with exchange rate 0.0371. Please note that $1 has been added before the log transformation.	3,728	74.14	3.14 (3.07)	1.19	2.17	7.90
LnIncome	Namibia	2004	Natural log of midpoint of personal monthly income, recorded as a categorical variable and translated into US dollars with exchange rate 0.1525. Please note that $1 has been added before the log transformation.	1,022	85.17	3.85 (3.87)	1.89	0	10.04
LnIncome	Nigeria	2008	Natural log of midpoint of personal monthly income, recorded as a categorical variable and translated into US dollars with exchange rate 0.00854. Please note that $1 has been added before the log transformation.	21,110	100.00	2.54 (2.48)	1.21	0	9.05
LnIncome	Rwanda	2008	Natural log of midpoint of personal monthly income, recorded as a categorical variable and translated into US dollars with exchange rate 0.001796172. Please note that $1 has been added before the log transformation.	1,894	94.70	2.27 (2.28)	1.23	0	8.78
LnIncome	South Africa	2006	Natural log of midpoint of personal monthly income, recorded as a categorical variable and translated into US dollars with exchange rate 0.14046.	3,249	83.44	4.01 (3.57)	2.44	0	9.21
LnIncome	Tanzania	2006	Natural log of midpoint of personal monthly income, recorded as a categorical variable and translated into US dollars with exchange rate 0.00082. Please note that $1 has been added before the log transformation.	3,427	69.06	2.75 (2.86)	1.43	0	5.42
LnIncome	Uganda	2006	Natural log of recorded annual household income, where monthly income is derived from adding responses from the following two questions: "What was the household's income from crop farming enterprises during the past 12 months?" and "What was the household's income from other economic activities which are not agricultural in the past 12 months?". This is then translated into US dollars with exchange rate 0.00055. Please note that $1 has been added before the log transformation.	606	20.48	2.83 (2.80)	1.06	0.60	6.02
LnIncome	Zambia	2005	Natural log of midpoint of personal monthly income, recorded as a categorical variable and translated into US dollars with exchange rate 0.00028. Please note that $1 has been added before the log transformation.	3,158	78.99	2.60 (2.45)	2.12	0	8.26

Variable	Country	Year	Coding	Obs	% of Total	Mean	Std. Dev.	Min	Max
Income	Botswana	2004	Midpoint of personal monthly income, recorded as a categorical variable and translated into US dollars with exchange rate 0.2066.	1,023	85.25	219.65 (226.68)	446.92	0	4,649
Income	Kenya	2006	NA	NA	NA	NA	NA	NA	NA
Income	Malawi	2008	Midpoint of personal monthly income, recorded as a categorical variable and translated into US dollars with exchange rate 0.00724.	4,650	93.13	107.82	639.82	0	12,670
Income	Mozambique	2009	Midpoint of personal monthly income, recorded as a categorical variable and translated into US dollars with exchange rate 0.0371.	3,728	74.14	53.72 (48.71)	143.74	7.73	2705
Income	Namibia	2004	Midpoint of personal monthly income, recorded as a categorical variable and translated into US dollars with exchange rate 0.1525.	1,022	85.17	182.00 (192.62)	777.91	0	22,875
Income	Nigeria	2008	Midpoint of personal monthly income, recorded as a categorical variable and translated into US dollars with exchange rate 0.00854 .	21,110	100.00	69.24 (68.96)	189.96	0	8,540
Income	Rwanda	2008	Midpoint of personal monthly income, recorded as a categorical variable and translated into US dollars with exchange rate 0.001796172.	1,894	94.70	28.57 (24.89)	170.55	0	6,511
Income	South Africa	2006	Midpoint of personal monthly income, recorded as a categorical variable and translated into US dollars with exchange rate 0.14046.	3,249	83.44	315.38 (216.93)	612.03	0	9,972
Income	Tanzania	2006	Midpoint of personal monthly income, recorded as a categorical variable and translated into US dollars with exchange rate 0.00082.	3,427	69.06	33.03 (32.16)	41.96	0	226
Income	Uganda	2006	Natural log of recorded monthly household income, where annual income is derived from adding responses from the following two questions: "What was the household's income from crop farming enterprises during the past 12 months?" and "What was the household's income from other economic activities which are not agricultural in the past 12 months?". This is then translated into US dollars with exchange rate 0.00055.	606	20.48	31.93 (30.00)	56.57	0	413
Income	Zambia	2005	Midpoint of personal monthly income, recorded as a categorical variable and translated into US dollars with exchange rate 0.00028.	3,158	78.99	65.15 (62.02)	177.93	0	3,850

Variable	Country	Year	Coding	Obs	% of Total	Mean	Std. Dev.	Min	Max
Risk Aversion	Botswana	2004	Fail to agree with statement "To get ahead in life, one needs to take some risks".	1,200	100.00	0.21 (0.21)	0.41	0	1
Risk Aversion	Kenya	2006	NA	NA	NA	NA	NA	NA	NA
Risk Aversion	Mozambique	2009	Fail to agree with statement "To get ahead in life, one needs to take some risks".	5,028	100.00	0.47 (0.48)	0.50	0	1
Risk Aversion	Malawi	2008	Name the big threats to your household. Risk averse if number of risks named is 3 or above. Not risk averse if number of big risks is 2 or less. The risks are: Drought or loss of access to water for farming, Flooding, Death of or loss of income from main income earner, Death of other family member excluding main income earner, Illness within your household or family, Separation or divorce, Theft, Fuel shortages or fuel price increases, Rise in prices, Rise in interest rates, Loss of your land or access to land you use, Loss of natural resources or loss of access to them e.g. forest, rivers, lake etc, Increase in household size (more dependents on household income), Fire, Jealousy of others towards me, Harvest failure or losses of crop after harvest, Death or illness of livestock, Corruption, Loss of employment, Loss of your business, Loss of your home, Loss of savings.	4,993	100.00	0.46 (0.48)	0.50	0	1
Risk Aversion	Namibia	2004	Fail to agree with statement "To get ahead in life, one needs to take some risks"	962	80.17	0.33 (0.32)	0.47	0	1
Risk Aversion	Nigeria	2008	Fail to agree with statement "To get ahead in life, one needs to take some risks"	21,110	100.00	0.16 (0.16)	0.36	0	1
Risk Aversion	Rwanda	2008	Thinking about things that happen to people from time to time that could cause problems with your income, which of the following, if any, do you think would pose the a risk to you? List of 18 risks provided. Risk averse = 1 if 7-18 risks mentioned, Not Risk averse if 6 or less mentioned. Risks include: Rwanda, Drought, Fire, Death of main income earner or loss of income from income earner, Death of family member (note this excludes main income earner), Earthquake, War or unrest in Rwanda, War or unrest in neighbouring countries, Fuel shortages or fuel price increases, General rise in prices, Rise in interest rates, Loss of land, Loss of home, Increase in household size (this is the number of relatives or household members dependent on household income), Loss of livestock or crops or plantation, Harvest failure, Loss of employment, Loss of assets, Loss of savings.	2,000	100.00	0.60 (0.61)	0.49	0	1
Risk Aversion	South Africa	2006	Fail to agree with the statement "To get ahead in life, one needs to take some risks".	3,453	88.67	0.26 (0.30)	0.44	0	1
Risk Aversion	Tanzania	2006	Proxy: Have insurance policy or agree with statement "I would like to have insurance but I cannot afford it".	4,962	100.00	0.77 (0.73)	0.42	0	1
Risk Aversion	Uganda	2006	Fail to agree with statement "To get ahead in life, one needs to take some risks".	2,959	100.00	0.21 (0.22)	0.41	0	1
Risk Aversion	Zambia	2005	Fail to agree with statement "To get ahead in life, one needs to take some risks".	3,531	88.32	0.28 (0.28)	0.45	0	1

Variable	Country	Year	Coding	Obs	% of Total	Mean	Std. Dev.	Min	Max
Time to Store	Botswana	2004	How long does it take you to get to your nearest food and grocery store?. Coding: 0 = 0 minutes, 1 = under 10 minutes, 2 = between 10 and 20 minutes, 3 = between 20 and 30 minutes, 4 = between 30 and 45 minutes, 5 = between 45 and 60 minutes, 6 = between 60 and 90 minutes, 7 = between 90 and 120 minutes, 8 = between 120 and 180 minutes, 9 = between 180 and 300 minutes and 10 = 300 minutes and above.	1,193	99.42	2.77 (2.76)	2.08	1	7
Time to Store	Kenya	2006	NA	NA	NA	NA	NA	NA	NA
Time to Store	Malawi	2008	How would you get to the nearest market if you had to visit it? Coding: Same as above.	4,702	94.17	3.57 (3.59)	1.92	1	8
Time to Store	Mozambique	2009	NA	NA	NA	NA	NA	NA	NA
Time to Store	Namibia	2004	How long does it take you to get to your nearest food and grocery store? Coding: Same as above.	1,171	97.58	3.65 (3.59)	2.36	1	10
Time to Store	Nigeria	2008	Exact length of time spent to get to your nearest food and grocery store? Answers between 0 and 245 minutes. Coding: Same as above.	21,110	100.00	1.74 (1.68)	1.17	0	9
Time to Store	Rwanda	2008	If you had to go to the bank, how would you get there?, How long does it take you to get there? Coding: Same as above.	1,912	95.60	4.57 (4.67)	2.18	1	10
Time to Store	South Africa	2006	How long does it take you to get to your nearest food and grocery store? Coding: Same as above.	3,768	96.76	2.17 (2.57)	1.55	1	7
Time to Store	Tanzania	2006	What is the average time you take travelling to get to the place where you undertake your business transactions? I am talking about (going and coming back). Coding: Same as above.	2,634	53.08	6.02 (6.19)	2.70	2	10
Time to Store	Uganda	2006	Time to store data available for banked and informally banked subgroups only.	NA	NA	NA	NA	NA	NA
Time to Store	Zambia	2005	How long does it take you to get to your nearest food and grocery store? Coding: Same as above.	3,939	98.52	2.75 (2.63)	2.02	1	10

Variable	Country	Year	Coding	Obs	% of Total	Mean	Std. Dev.	Min	Max
Mobile	Botswana	2004	Personally have access to mobile phone = 1, Don't have access to a mobile phone = 0.	1,200	100.00	0.44 (0.43)	0.50	0	1
Mobile	Kenya	2006	Have own mobile phone and use it = 1, Do not have own mobile phone = 0.	4,418	100.00	0.27 (0.26)	0.44	0	1
Mobile	Malawi	2008	Personally have one or more mobile phone = 1, Don't have mobile phone = 0.	4,993	100.00	0.33 (0.32)	0.47	0	1
Mobile	Mozambique	2009	Personally have access to a mobile phone = 1, Do not have access to = 0.	5,028	100.00	0.27 (0.21)	0.45	0	1
Mobile	Namibia	2004	Make use of a pre-paid, contract or business mobile phone = 1, Do not = 0.	1,200	100.00	0.45 (0.45)	0.50	0	1
Mobile	Nigeria	2008	Regular use of pre-paid or contract mobile phone = 1, Do not make regular use of a pre-paid or contract mobile phone = 0.	21,110	100.00	0.42 (0.46)	0.49	0	1
Mobile	Rwanda	2008	One or more mobile in household = 1, Do not have = 0.	2,000	100.00	0.15 (0.13)	0.36	0	1
Mobile	South Africa	2006	Personally use a pre-paid, contract or business mobile phone = 1, Do not = 0.	3,894	100.00	0.57 (0.53)	0.49	0	1
Mobile	Tanzania	2006	You have a pre-paid, contract or business mobile phone = 1, Do not = 0.	4,962	100.00	0.19 (0.14)	0.39	0	1
Mobile	Uganda	2006	Personally use a mobile phone = 1, Don't use mobile phone = 0.	2,959	100.00	0.28 (0.26)	0.55	0	1
Mobile	Zambia	2005	Have access to or regularly use a mobile phone = 1, Do not = 0.	3,998	100.00	0.26 (0.28)	0.44	0	1
Urban	Botswana	2004	Urban = 1, Rural = 0.	1,200	100.00	0.33 (0.33)	0.47	0	1
Urban	Kenya	2006	Urban = 1, Rural = 0.	4,418	100.00	0.32 (0.24)	0.47	0	1
Urban	Malawi	2008	Urban = 1, Rural = 0.	4,993	100.00	0.19 (0.16)	0.39	0	1
Urban	Mozambique	2009	Urban = 1, Rural = 0.	5,028	100.00	0.53 (0.34)	0.50	0	1
Urban	Namibia	2004	Urban = 1, Rural = 0.	1,200	100.00	0.37 (0.40)	0.48	0	1
Urban	Nigeria	2008	Urban = 1, Rural = 0.	21,110	100.00	0.24 (0.28)	0.42	0	1
Urban	Rwanda	2008	Urban = 1, Rural = 0.	2,000	100.00	0.26 (0.15)	0.44	0	1
Urban	South Africa	2006	Urban = 1, Rural = 0.	3,894	100.00	0.40 (0.38)	0.49	0	1
Urban	Tanzania	2006	Urban = 1, Rural = 0.	4,962	100.00	0.55 (0.28)	0.50	0	1
Urban	Uganda	2006	Urban = 1, Rural = 0.	2,959	100.00	0.29 (0.25)	0.45	0	1
Urban	Zambia	2005	Urban = 1, Rural = 0.	3,998	100.00	0.32 (0.35)	0.47	0	1

Data Appendix A2: Products that Determine Formally Banked Status												
* = additional products over FinScope official methodology. [a] Exact FinScope official methodology not available for Mozambique, Tanzania and Uganda.												
Botswana	Kenya	Malawi	Mozambique[a]	Namibia	Nigeria	Rwanda	S. Africa	Tanzania[a]	Uganda[a]	Zambia
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ATM card	ATM card	Current account with cheque book	Current account	Debit card	An ATM card	Bank account	Mzansi account	ATM card	ATM card	ATM card
Debit card/ Cheque card	Debit card	Current account with ATM card	term deposit	Savings book at a bank	Debit card	Savings book at a bank	ATM card	Debit card	Debit card/Cheque card	Visa electron account
Savings book at a bank	Post Bank account	Debit card	Savings account	Nampost savings bank account	Credit card	Savings account at a bank	Debit card/Cheque card	Post Bank account	Current or cheque account	Savings account
Savings/Transaction account	savings account	Credit card	Savings plan	Savings account	Savings/transaction account	Savings account at a bank	Savings book at a bank	Savings account	Credit card	Current or cheque account
Current or cheque account	Current account	Malswitch card / Cash card	Salary account	Transaction account	Current or cheque account	Debit card	Post Bank account/Post Office savings account	Current account	Fixed deposit bank account	Credit card
Credit card	Credit card	Savings account - Fixed term deposit / Call account	Loan account	Current or cheque account	Fixed deposit bank account	Cheque card	Savings/Transaction account	Fixed deposit bank account	Home loan from bank or bond/mortgage to pay for a house	Fixed Deposit bank account
Fixed deposit bank account	Fixed deposit bank account	Savings account with ATM card	Debit card	Credit card	Mortgage or housing loan	Current or Cheque account	Current or cheque account	Personal loan from a bank	Personal loan from a bank	24 hour call account
Personal garage card/Petrol card	Loan to buy/build house from bank	Overdraft on your bank account	Credit card	Fixed deposit bank account	Personal loan from a bank	Overdraft facilities	Credit card		Overdraft facility	Overdraft facility
Money market account	Loan to buy/build house from building society	*Savings in Treasury bills or Government bonds	Check book	Personal garage card/Petrol card	Vehicle finance	Credit card	Fixed deposit bank account	Remittances through FI where you hold account		Debit card
Home loan from bank or bond	Personal loan from a bank	*Money held in shares / Stock market	Overdraft facility	Money market account	An overdraft	Foreign bank account	Personal garage card/Petrol card	Loan from FI to buy a house		Unit trust account
Personal loan from a bank	Overdraft facility	*Savings at a bank	Bank check	Home loan from bank or bond/mortgage to pay for a house	Islamic loan	*Capital/stock market (including Treasury bonds)	Money market account			High interest savings account
Vehicle finance through bank			Standing order	Personal loan from a bank	Islamic financing investment	*Savings at a post office	Cell phone banking e.g. MTN, Banking, Wizzit, FNB/ Home loan from bank or bond/mortgage to pay for a house			US dollar account
Overdraft facility				Vehicle or car finance through bank or dealer		*Loan from Bank (e.g. Bank Kigali, BCR, BNR)	Home loan from bank or bond/mortgage to build, extend or improve a house			Bank account outside of Zambia
Treasury bills				*Overdraft facility			*Personal loan from a bank			credit card
Offshore investment										Standing order
										*Loan from bank to buy a house
										*Personal loan from bank
										*Treasury bills