

# **Inclusive Finance and Agricultural Development in Africa**

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## **Abstract**

This chapter provided an overview of agricultural credit and financial inclusion in Africa, but with limited focus. The reality is that each country has unique financial structures and programs with varying degrees of access and usage. There is significant variability between West and East Africa, and Northern and Southern Africa. This is evidenced by the heterogeneity in the common elements such as deposits, credit, mobile use or insurance discussed herein. Financial inclusion in Continental Africa has mixed impacts depending on country and region. A significant number of micro-studies across Africa concludes that there is a relationship between agricultural credit and agricultural productivity, and with respect to insurance outcomes look promising except, perhaps, for the very poor. The very poor need specifically targeted policies that could include subsidies.

## 1 Introduction

In this chapter we explore the role of agricultural finance and inclusive finance as it relates to continental Africa, although the focus is on conditions in sub-Saharan Africa. Meyers (2015) writes of the slow process of developing African rural financial markets. To speak of Africa as a whole is difficult since financial development with few exceptions (e.g Africa Risk Capacity, ARC) are on a country-by-country basis rather than a continental strategy. The results as characterized by Meyers (2015) are disappointing. Low levels of financial intermediation, high and varied interest rates result from currency and macroeconomic uncertainties, high government demand for loan funds, lack of competition, relatively small bank sizes and contractual problems including weak creditor rights, compromised courts, a deficient insolvency framework and a general disrespect for contracts (Page 7, cf Honohan and Beck, 2007). These raise significant barriers to financial development in the agricultural sector.

Historically, several waves of intermediation interventions have been attempted, starting with interest rate ceilings that undercut the marginal costs and risk of credit delivery to farmers (Adams, 1971; Adams et al. 1984; Gonzales-Vega, 1982; Braverman and Guasch 1989). This was succeeded by a period that adhered to the ‘financial systems paradigm’ which targeted financial institutions, markets and instruments, the legal and regulatory environment, and financial norms and behavior (Myers 2015, Page 8). These initiatives parroted the Washington Consensus which promoted financial sector deregulation of central banks in order to deepen financial markets and reduce economic frictions that had financially repressed markets, interest rates and economic growth (McKinnon 1973; Shaw 1973; Townsend and Ueda 2006; Roubini and Sala-i-Martin 1992). Financial repression, it is argued, can have a direct impact on credit demand. Bencivenga and Smith (1992), for example, make the case that financial repression results in increased self-financing of investment and accessing of capital from informal means. The argument here is that

financial repression places an undue restriction on financial reserves in the formal market which restricts the total supply of loanable funds for purposes of investment.

Despite the economic reasoning of financial deepening, the presumption that deepening would create spillover effects to increase the supply of credit into rural markets was sorely overestimated. Capital controls and interest rate policies that might have repressed credit to agriculture before the 1989 Washington Consensus (Williamson 2000, 2004) could never overcome the stark reality that the combined effects of wide covariate risks and costly delivery led to continued credit rationing. The drivers of financial repression might have changed in form but not substance when it came to agricultural finance. As Williamson (2004; see also Kanbur 2009) points out, the problem with the Washington Consensus was that it failed to consider the realities of the economies on the ground and that different countries had different political and social agendas or were at different stages in development. Consequently, the institutions required to deal with large-scale global reforms were not in place. In fact, the combined effects of financial deepening in the urban/industrial complex coupled with continued repression in the rural/agricultural markets might have catalyzed rising inequality, albeit in complex ways (Kuznets 1955; Townsend and Ueda 2006).

Continued repression of poorer populations, in general, was a motivator in the development of microfinance institutions (MFI). They emerged in unregulated form to provide loans to the poor using the strength of social networks and group lending to make small loans (often secured by trust and savings rather than hard collateral assets) to previously unbanked populations (Meyers 2015). Value chain financing also took shape over this period with some combination of higher value market access, technical assistance (supporting higher quality product) and better access to inputs and credit being highly valued (Ricketts et al. 2014, Bellemare 2012). With value chains offering greater discipline in the use of inputs and direct access to broader domestic and international markets, the participating firms became, in essence, agents of the banking system. Lenders

transferred risk from direct lending to farmers to meso-level lending to the chain that could provide greater security in terms of hard assets, contracts and inventory.

## 2 Financial Inclusion

The concept of financial inclusion emerged more recently. Financial inclusion as a concept was coincident with the new structural economics approach of Stiglitz (2011) and Lin (2011). The new structural economics paradigm argues that for developing economies to proceed in a sustainable growth pattern there must be an alignment between the rapidly growing industrial sector and uneven growth observed in agricultural production, productivity and household income equality. The paradigm recognizes that from time-to-time there is a role for government to play to smooth and encourage an economic evolution. An extension of this idea is the notion put forth by IFAD (2016) of “inclusive rural transformation”. Inclusive rural transformation is a “process in which rising agricultural productivity, increasing marketable surpluses, expanded off-farm employment opportunities, better access to services and infrastructure, and capacity to influence policy all lead to improved rural livelihoods and inclusive growth” (IFAD 2016, Page 12). Inclusive financial systems are critical to rural transformation because they offer the capital needed to generate widely-based and equitable economic growth. To achieve equity, policy makers and regulators need to identify the disparate needs for, and uses of, credit (and other financial services) by the various subgroups or quantiles of farm households. Inclusive financial policies take a step back from the Washington Consensus in the sense of Stiglitz (2011), and represent a more realistic paradigm that would allow for second-best solutions, or interventions, to undo ineffective policies of the past, recognize market imperfections and market failures for what they are, and attempt to meld those efforts towards a long-run sustainable growth path. This involves at times being both pro-poor and smart. Financial institutions and policies need to be adaptive to modern realities, but in responding to these realities, it is necessary to address the institutional heritage that has led to the present, and when deemed inefficient correct as much as is possible. Stiglitz (2011; Page 233) notes “*The choice is not between an imperfect government and a perfect market. It is between*

*imperfect governments and imperfect markets, each of which has to serve as a check on the other; they need to be seen as complementary, and we need to seek a balance between the two—a balance which is not just a matter of assigning certain tasks to one, and others to the other, but rather designing systems where they interact effectively*”. This view echoes Keynes (1926, page 291) who wrote on the end of Laissez Faire (as provided in Kanbur 2015), “*The important thing for government is not to do things which individuals are doing already, and to do them a little better or a little worse; but to do those things which at present are not done at all.*”

## 2.1 Financial Inclusion Action Plan

There are seven goals to the G20 Financial Inclusion Action Plan (FIAP) from the Global Partnership for Financial Inclusion (GPFI, 2017). The G20 agenda specifically states support of inclusive financial policies targeted to underserved (poor, women, youth, people in remote rural areas) and vulnerable groups including elderly, migrants and displaced persons that encourage the following:

- 1) Prevent people from falling into poverty,
- 2) Expand access to credit and insurance that help farmers make bigger investments,
- 3) Undertake reforms to give women equal rights to economic resources,
- 4) Access to financial services that allow (farmers) to gain higher returns on capital,
- 5) Foster innovation through greater access and usage of affordable credit,
- 6) Reduce inequalities by helping (farmers) absorb shocks via insurance, and
- 7) Assist in the management of medical expenses.

It is not essential that any policy initiative assert compliance in all of these, but the degree by which they are integrated suggests direct action on one will (or should) have indirect spillover effects on one or more of the others. For example, financial policy proposals directed towards smoother income and consumption cycles can also promote well-being and provide the resources for improved health.

Financial inclusion means that all working-age adults (persons at the age of 15+) have effective and quality access to, and usage of financial services provided by formal institutions. “Effective access” involves convenient and responsible delivery of services that are responsive to the needs of financially excluded and underserved customers, at a cost affordable to the customers and sustainable for the providers. The demonstration of effective access is usage. The fact that a customer can access services offered by a formal financial service provider does not mean she or he is “financially included.” For this, the conditions of “effective access” must be met (GPMI White Paper. 2 ,2016, fn page 6).

GPMI has identified four key trends that will set the stage for continuing the progress in achieving financial inclusion over the coming years:

1. Financial inclusion has been placed in the spotlight of inclusive and sustainable development in recognizing the 2030 Agenda for Sustainable Development as the overarching framework for sustainable development worldwide;

2. The rapid development and penetration of digital innovations and digital financial products and services, including digital identity, related to the FinTech revolution introduce an unprecedented opportunity to accelerate financial inclusion.

3. Increased attention to the importance of responsible access and usage of financial services for the poor strengthens the focus on underserved and vulnerable groups; and

4. The mainstreaming of financial inclusion alongside other financial sector development goals of stability, integrity and consumer protection, reinforces the notion that the goal of financial inclusion and other financial sector goals can be mutually supportive (Page 7)<sup>1</sup>.

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<sup>1</sup> These are consistent with the Strategic Development Goals which include 1.Eliminating extreme poverty (SDG1); 2.Reducing hunger and promoting food security (SDG2); 3.Achieving good health and well-being (SDG3); 4.Promoting gender equality (SDG5); 5.Promoting sustained, inclusive and sustainable economic growth, full and productive employment and decent work (SDG 8); 6. Building resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation (SDG 9); and 7.Reducing income inequality within and among countries (SDG 10)

## 2.2 Access and Usage

The concept of financial inclusion was originally put forward by the United Nations in 2005. The policy concern was that simply focusing on financial development in terms of financial deepening and depth of financial services focused almost entirely on the factors, policies and institutions that lead to effective intermediation and markets. Standard metrics, such as the ratio of financial institutions' assets to GDP ratio, the ratio of liquid liabilities to GDP or deposits to GDP provided only macro-scale measurements of the financial sector. But these measures bypassed the distributional aspects of credit - particularly in the lower quantiles of the household frequency distribution- and said little about where financial institutions were concentrated, who had access to credit, and who borrowers were. Indeed, financial depth captures the financial sector relative to the economy. It is the size of banks, other financial institutions, and financial markets in a country, taken together and compared to a measure of economic output. If there were particular groups, e.g. poor farm households that were excluded from credit markets by access or rationing, these would not be captured by macro metrics based on averages.

To counter this, the concept of financial breadth deals with accessibility to financial services or the level of financial services. (Beck et al., 2000, 2007a). It is the channel with which financial intermediaries can put capital into the national economy and is often measured by the number of branches and, separately, deposit accounts per capital (Demirguc-Kunt et al. 2011), among other performance measures (Dev, 2006; Sarma and Pais, 2011; Chakravarty and Pal, 2013). The difference between financial breadth and financial inclusion is in the focus on the individual

borrower. As Beck et al. (2008) points out, increased access to credit does not imply increase use of credit. Financial inclusion, therefore, is aligned with both access and usage, thereby allowing individuals and firms to take advantage of business opportunities, invest in education, save for retirement, and insure against risks (Demirgüç-Kunt, et al., 2008). In reality, financial inclusion as a concept requires the merging of breadth and depth into a single paradigm suggesting that the two concepts are sufficiently entwined that one can be explained by the other. Put another way, financial depth is a necessary but not sufficient condition for financial inclusion, while financial inclusion is a sufficient but not necessary condition for financial depth; policies directed towards rural lending can only be achieved by building healthy rural financial institutions. These have to be done in a smart way because of the high costs and risks of underwriting small loans in rural areas. Imposing interest rate ceilings, as was recently done in Kenya, can lead to a flight of capital that dampens breadth and discourages depth.

The suite of policies available to the financial sectors of continental Africa (and elsewhere) are summarized in Table 1. Inclusive financial policies are not directed only at agricultural credit, but also savings, insurance and other financial services, including mobile and electronic technologies. Figure 1 provides a schematic that relates policy to supply and demand forces. The catalyst is political will, and this will is becoming more evident with the global push for financial inclusion. But the drivers, channels and solutions are complex. The upper branch is driven by demand forces that improve access to credit, while the lower branch is driven by supply forces to expand access to financial services. Demand is driven by a number of not-mutually exclusive



factors including demand characteristics, optimal use of inputs and input demand, consumption smoothing, risk balancing, risk aversion and risk rationing. The supply side is comprised of formal and informal markets, other financial services (insurance) and financial education. The credit facilities include gender balancing, distance to access, collateral and guarantees, loan flexibility and structured financial products such as bundled, linked or risk-contingent credit.

Table 1: Summary of Policies to Support Financial Depth, Breadth , Access and Usage

The government's role on policy involves many aspects including: regulation; oversight; and promoting financial development, securing transactions, building infrastructure (e.g. roads and cellular), as well as the promotion of agricultural development through land laws, registration, outreach and extension. This also involves removing exclusionary regulations that may limit access to certain groups, while promoting inclusive financial policies.

Figure 1: Schematic of Financial Development

### 3 Evidence on the Relationship between Inclusive Finance and Agricultural Productivity

There are many agricultural programs incorporating inclusive finance across Africa. For example, Abdallah et al (2019) identify numerous programs in Ghana including the block farms program (BFP) where land blocks are transferred in smaller units to beginning farmers with subsidized input costs and zero interest loans; Agricultural Mechanization Services Enterprise Centers (AMSECs) program that subsidize price and interest rate on tractor loans; Stanbic/AGRA

loan guarantee program which provides a facilitator/ pro rata loss guarantee program; Wienco Masara N'arzuki input-credit project (input credit project to increase small and medium holder productivity), AGRA/CARD credit program (to provide support for soil health) and institutionally, a collateral registry system (registering of assets under collateral to ease collections on default), Credit Reference Bureau (centralizing credit scoring), USAID Financing Ghanaian Agriculture Project (financial facilities for agribusiness).

Barrowclough et al (2020) investigate the relationship between financial inclusion and household welfare and develop an index to capture access, quality and usage. Usage indicators included account ownership, saving propensity, credit availability, and insurance coverage. Account ownership has been linked to increased credit access, savings and consumption as well as easing receipt of salaries, remittances, and government payments (Demirguc-Kunt and Klapper, 2013). Account ownership was captured by e-banking, mobile money, ATMS, e-zwich and a checking account. Savings was captured through savings account, and fixed deposit accounts, and access was measured by having applied for a loan or receiving a loan. (may be limited to usage and not necessarily access). Insurance was drawn from medical, auto, business or long term annuity or life insurance. From a sample of 13,000 Ghanaian households (2017 GLSS7 survey), 56.4% of households were excluded from financial services entirely, 35.9% had low inclusion indicating use of some form of account or transactions (mobile or ATM) , 7.3% were found to be in medium inclusion, which included checkbook and/or savings accounts and insurance, and only 0.4% were in a high inclusive grouping which included obtaining credit. Multinomial logit results indicated that rural households were less likely to be included in the low to medium inclusion groups, but no differences were found in the high inclusion group. Further categorization indicates that respondents with wage labor were significantly more likely to be included in the financial market. Inclusion bias appears to be against agricultural households, but, again, the argument of inclusion/exclusion relies on both usage and access.

This also affects rural youth. For example, Ankrah Twumasi, Jian and Owusu (2019) using 2018 data collected in Ghana comprised of 450 rural youth farmers found that 211 (47 percent) of the respondents were credit constrained. Transactions costs in the forms of cumbersome loan application procedures and loan disbursement times contributed to these credit constraints. Youth farmers facing these credit constraints (quantity and transactional) were found to have lower intensity of participation in agriculture activities than a random farmer from the sample. Jumpah et al (2019) investigated smallholder farmers in Ghana and showed that distance, interest rate, experience, membership of farmer-based organization, number of dependents, household, gender and age were statistically significant farmer- and credit-specific characteristics that influence participation in microfinance programs. The direct and indirect costs of interest rates and distance negatively affected participation. Sackey (2018) finds that credit rationing persists and that applying for a relatively longer payment period, providing collateral and guarantor, being illiterate, being relatively older and being in the agricultural sector increases the likelihood of being credit rationed, while having some relationship with the bank, having non-mandatory savings and applying from a bank with relatively high interest rates reduce the likelihood of being credit rationed. Asante-Addo et al. (2017) find that farm households participate in credit programs because of improved access to savings services and agricultural loans, yet fear of loan default (risk rationing) and lack of savings are reasons for non-participation in credit programs. Membership in farmer-based organizations (FBOs) and the household head's formal education are positively associated with farmers' participation in credit programs and credit rationing (i.e. their loan applications were either rejected or the amount of credit they applied for was reduced) was less likely among higher income farmers and members of FBOs such as farmer cooperatives and savings clubs. While gender bias against women is a common finding in agricultural credit Sarworsi, Romer and Musshoff (2016) using data on 9,710 farmers from Madagascar provided by the AccèsBanque Madagascar found that despite observations that female farmers had lower

repayment performance, they had a higher rate of loan application approval compared to male farmers.

This theme of credit access and credit usage has strong implications for agricultural productivity and general household welfare in Africa. Numerous papers including Nordjo and Adjasi (2019), Martey et al (2019), Jumpah et al (2019), Abdallah et al (2019), Nkegbe (2018), Iddrisu et al (2018), Sekyi, Abu and Nkegbe (2017), Akudugu (2016) use a variety of techniques and small samples but provide strong meta-evidence that there is a direct and significant lineage between access/use of formal credit and, in some cases, informal credit and agricultural productivity. Abdallah (2016) finds that the relationship between credit and technology adoption is a one-way causal relation (i.e. credit access leads to technology adoption) as opposed to a two-way relation (i.e. mutually dependent relation) and that credit market inefficiency can be a major barrier to the adoption of yield-enhancing technologies in Sub-Saharan Africa. Tadesse (2014) use 2005 and 2007 panel data on 278 Ethiopian households covering 5,700 field plots. They find that only 22% of the plots actually had fertilizer applied but also found that wealthier farmers were more likely to purchase fertilizer from savings while poorer farmers were more dependent on credit.

#### 4 The Status of Financial Inclusion in Continental Africa

The MIX Market 2017/2018 reports that Africa is served by 113 financial service providers (FSP) lending to approximately 5.4 million borrowers with gross loans of 9.5 Billion USD. These service providers have 26.7 million depositors for a borrower to depositor ratio of about 4.96 and deposits of 13 billion for a loan to deposit ratio of about 0.72. The makeup of FSP is 24 banks, 16 credit unions, 40 non-bank financial institutions and 32 NGOs.

Of the 762 MFIs globally tracked by MIX, 113, or 14.8 %, are in Africa<sup>2</sup>. In terms of overall activity, the entirety of borrowers in Africa is just slightly higher than the total number in

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<sup>2</sup> <https://www.themix.org/mix-market> Microfinance data service operator

the Philippines (5.2 million) and considerably less than the 38 million in India. The top five countries are Nigeria (1,890K), Kenya (826.7K), Benin (620.6K), Uganda (296.8k) and Ghana (246.8K). Kenya dominates with deposits having 11,740.2K depositors followed by Nigeria with 5,593k. Africa and its member countries have their own characteristics, which can limit the growth in microfinance institutions. For example, in 2016, the Kenyan government imposed an interest rate cap which in turn repressed lending activity in small enterprises and encouraged a flight to safer corporate borrowers. Drought and political unrest also had an impact on loan discernments in Kenya.

One of the most critical tracking datasets for financial inclusion is the Global Findex Database which is currently available for 2011, 2014 and 2015 (Demirgüç-Kunt et al, 2018)<sup>3</sup>. Figures 2 and 3 provide data on account holdings across sub-Saharan Africa for the three sampling points.

Figure 2: Accounts at Financial Institutions and Mobile Services, Sub-Saharan Africa:  
Source Global Findex Database, 2017

Between 2011 and 2017, financial/mobile accounts increased by 83%, across all borrowers but only 77% for females. On a percentage basis, the poorest 40% of households increased by 147%, compared to 69% for the richest 60% of households. The rapid rise in the poor is due to inclusive financial measures targeting the poor, and by this measure, policies appear to be effective. Rural households nearly doubled from 19.4% to 39.5% between 2011 and 2017.

Figure 3: Holding Accounts at Financial Institutions

Figure 3 looks only at respondents' accounts at financial institutions, and this tells a different story. In 2011, mobile banking and mobile accounts were at their infancy. Across all respondents in sub-Saharan Africa, the increase in accounts at financial institutions was 140%. In

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<sup>3</sup> <https://microdata.worldbank.org/index.php/catalog/global-findex>

other words, there were more mobile accounts opened between 2011 and 2017 than institutional bank accounts opened. Women increased institutional accounts by 31.5% suggesting that mobile accounts increased by about 45%. Perhaps most striking is the reliance on mobile accounts by the poor. In 2011, only 12.9% of the poor had institutional accounts and this increased to 22.7% in 2017. The difference in mobile accounts is the spread between 31.9% in Figure 2 and 22.7% in Figure 3 is 9.8%. In other words, nearly half (76%) of the total 147% increase in access to institutional/mobile accounts was due to mobile technology and not institutional growth. The same pattern is observed for rural respondents of whom 53.9% more opened institutional accounts by 2017 than in 2011, but this is only slightly more than the 49% who obtained mobile accounts. While it appears that sub-Saharan Africa has succeeded in providing access to institutional and/or mobile accounts, the two differ in form. They don't necessarily imply an equal or monotonic increase in usage, and the distinction here is important.

Figure 4 pairs up two measures of borrowing. The top panel indicates the % of respondents who borrowed any money in 2014 and 2017. The lower panel identifies those that borrowed from a financial institution or used a credit card. Since credit card usage is very low, this measure can reasonably represent the use of banks for loans. The first thing to note is that total borrowing actually decreased for all groups between 2014 and 2017. All respondents fell from 54.8% to 45.7%. While this can reasonably capture the total demand for credit, it is notable that only a fraction comes from formal financial institutions. Between 2014 and 2017, loans from banks increased from 7.5% to 8.4%, less than a 1% increase. Loans to men, the wealthy, and rural households increased by over 1%, while loans to women and the poor was less than 1%. The differences between the upper and lower panel represent borrowing that is not satiated through formal lending. This would include familial borrowing from friends and relatives, savings clubs, moneylenders, pawnshops, and suppliers or value chains. In terms of financial inclusion, a comparison of the number of accounts opened represents increasing access, but the actual borrowing from financial institutions suggest that usage is low.

#### Figure 4: Borrowing Access and Usage, Sub-Saharan Africa

With a nearly 38% gap in borrowing activity and borrowing from a bank, it is important to identify where borrowed funds are obtained. Figure 5 compares sources of borrowing for selected countries in Sub-Saharan Africa. In Kenya and Uganda, about 46% of borrowing is dominated by familial lending between friends and relatives. Savings clubs are also popular in Uganda (24.1%), Malawi (23.3%) and Kenya (19.7%). Although these savings clubs are economically significant, they have evolved to different degrees of importance in different countries. For example, they are not well-developed or popularized in Ethiopia, Ghana, or Nigeria.

#### Figure 5: Sources of Credit by Country

The amounts borrowed from banks is considerably lower. In Cameroon, Ethiopia, Malawi, Nigeria, and Tanzania, borrowing from banks is less than 10%. Only Kenya (16.5%) and Uganda (15.6%) exceed 15% and not by much. These observations suggest that degrees of financial inclusion in terms of bank lending have different levels of access and use, and these, in turn, are likely related to the varied pathways to economic development. The final row in Figure 5 provides the percent of respondents that borrowed for farm or related business activities. Demand is relatively low, ranging from 11.6% in Cameroon to 22.1% in Uganda. Only 1 in 5 Kenyans or Ugandans borrowed for farm business, and this exceeded the percentage of those that borrowed for a bank. The shortfall is made up from family/friends or savings clubs. What is unclear is whether access to formal credit markets is limited by credit rationing, or whether usage is restrained by low and disinterested demand or risk rationing. However, as mentioned, expanded financial development throughout Africa may not so easily translate into broader access to credit services, and likewise, even if access is expanded in a way that is consistent with the goals of financial inclusion policy, this does not necessarily imply that usage will increase.

## 5 Credit Risk

Grasping credit risk in Africa is difficult. However data from the Council on Smallholder Agricultural Finance through 2018 (<https://data.csaf.org/>) provides some indication of the risk that lenders face. The CSAF consists of 12 private lenders to SMEs and value chains globally<sup>4</sup>. These are not smallholder loans, but in many instances, the value chains act as lending agents to their member growers. Perhaps more critically, because members are concentrated into the same growing grower group (predominantly coffee (17%), cocoa (29%), and cashew (27%)), they have the same systemic and covariate risks. Figure 6 compares the PAR30 (portfolio at risk, 30 days past due) of the global portfolio and that of sub Saharan Africa. PAR 30 ranged from 14.1% in 2013 to a low of 4.5% in 2017. On average, SSA loans were 10.3% compared to the global portfolio of 8.4%.

Figure 6: Portfolio Risk, sub-Saharan Africa

Figure 7 reports the portfolio at risk for a subset of African countries sourced from the MIX report. Average loan balance was 991 USD and deposits were 199USD. The challenge across Africa is the variability in loan performance due to external factors. A severe drought in Malawi in 2016 that left many on the brink of starvation increased loan PAR90 to 58.2%. Political unrest in Cameroon in 2016 corresponded with a significant increase in loan arrears. It is difficult to ascertain what the steady state loan delinquency rate would be, but it is generally low around 2-3%. It is the complexity of Africa that makes lending difficult.

Figure 7: Value at Risk, PAR30 by Country

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<sup>4</sup> (AgDevCo, AlterFin, Global Partnerships, Incofin, Oiko Credit, Rabo Rural Fund, ResponseAbility, Root Capital, Shared Interest, SME Impact Fund, and Triodos)



## 6 Savings

Much has also been said about the role of savings in development. Figure 8 shows the percentage of respondents in Sub-Saharan Africa that save in financial institutions between 2011 and 2017. The Findex results show a slight increase in savings between 2011 and 2014 but a decrease between 2014 and 2017 on average for females and the richest 60%. It also shows only slight increases for men, the poorest 40%, and virtually no change for rural households. Again, relative to increased access to financial services as provided in Figures 2 and 3, this does not appear to have increased usage by a material amount.

Figure 8: Savings at Financial Institutions in Sub-Saharan Africa (%)

Figure 9 shows the use of digital and mobile technologies in Sub-Saharan Africa. 29.1% of respondent indicated making some form of e-payment in 2017, up from 22.8% in 2011. Rural digital use increased from 20% to 26.2%. Related to this is the use of mobile phones or internet to access accounts. 20.8% of all respondents indicated that they had used mobile phones or the internet to access accounts, including 19.1% of rural households. Women and the poor tend to fall behind the average. However, within sub-Saharan Africa, there is considerable diversity in both access and use. For example, Figure 9 shows ownership of mobile phones in Kenya is 88.6% , but in Malawi, it is only 52.3%. With M-Pesa, 76.9% of Kenyans report having a mobile money account, but in Ghana, it is only 43%, Malawi 22.7%, and virtually non-existent in Ethiopia. Although many banks will have expanded the breadth of services to accommodate mobile and internet access, only 31.8% of Kenyans, actually use mobile (or internet) technologies to access financial institution accounts. Usage is below 10% for Cameroon, Ethiopia, Malawi, Tanzania and Uganda. In other words, despite access, usage is quite low which could be for a multitude of reasons ranging from the infrastructure of cellular networks and cellular access to whether an account is opened at an FI.

Figure 9: Digital and Mobile Phone Use, Sub-Saharan Africa

Figure 10: Access and Use of Mobile Technologies by Country

## 7 Risk Rationing , Credit Rationing and Collateral

Collateral is a significant barrier to credit access in Africa. In times of stress, e.g. drought, when all savings and food reserves are depleted, farmers have to resort to selling consumable, and later productive assets, depending on the severity of stress. The dynamics of risk leave many farmers with an initial position in poverty to be trapped in that poverty, while those with more means could transition into a poverty state and remain there until the collective liquid and productive assets accumulate beyond the poverty threshold (Barrett and Carter, 2013). To smooth consumption across periods of adversity, traditional mitigation strategies have relied on a Joseph effect in which households accumulate liquid savings and food reserves during good years, and use these to smooth consumption over bad years. Morduch (1995) suggests that income smoothing is more likely to occur when households anticipate being unable to borrow or insure. In the alternative, farmers can access credit from informal or formal sources or employ other risk coping strategies, including savings clubs. There are two interrelated problems with this narrative. First, even though farmers appear to have improved access to formal credit, they do not use it, and second, this limits the ability to migrate out of low-scale farming. Limits to credit demand in turn remove incentives for FSP to add to the depth or breadth of credit supply. The failure of agricultural credit markets to meet the G20 financial inclusion goals is largely due to a complex endogenous relationship between supply and demand as depicted in Figure 1. Part of this complexity is illustrated in Castellani (2014) who finds that shocks that affect household assets in Ethiopia are important in explaining both the decision to borrow and the source of credit.

### 7.1 Risk Rationing

The barrier point for low-level equilibrium in African credit markets is risk and collateral. A convenient terminology which has been previously expressed in this chapter is ‘risk rationing’.

Boucher, Carter and Guirkingner (2008; see also Boucher, Guirkingner and Trivelli, 2009) provide the first formal treatment of risk rationing in an economic and utility-centric context. In their view, risk rationing occurs when insurance markets are absent, and lenders facing asymmetric information shift so much contractual risk to the borrower that the borrower voluntarily withdraws from the credit market. This can arise even when the borrower has the collateral wealth needed to qualify for a loan contract. Formalizing risk rationing as an economic concept explains some puzzling observations by development economists including Binswanger and Siller (1983) who suggested that credit markets for small farmers may disappear because of lack of demand, despite the fact that small farmers might have available collateral in the form of unencumbered land. Bell, Srinivasan and Udry (1997) found a credit demand relationship in which demand increases with liquid assets but decreases with fixed assets, which they find both puzzling and unsatisfactory. Eswaran and Kotwael (1990) observed that an inordinate degree of risk aversion to credit may be a reflection of their inability to sustain downswings in income

Similar situations are echoed in Africa. Shee, Turvey and Woodard (2015) find widespread risk rationing in the pastoral Marsabit region of Kenya. Pastoralists were explicit in their views that taking a loan would jeopardize their assets, and they were afraid of losing collateral. What is key is that they do have a demand for credit but do not act upon it and in doing so risk ration themselves out of the market. As depicted in Figure 5 above, the reliance on familial lending is as much a risk coping strategy as one of convenience<sup>5</sup>. When asked how much they would borrow without collateral requirement, they mentioned a need of 100,000 – 300,000 KSh for various entrepreneurial activities such as milk and meat trade, small shop, animal tracking etc. In Turbi, a pastoral region of Kenya, pastoralists indicated that although Equity Bank had a presence in the

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<sup>5</sup> As an example of familial lending, risk coping and income smoothing, Shee, Turvey and Woodard (2015) report on a post-disaster usufruct loan in which camel herders with a surviving herd would loan camel cows to one who lost the herd. The ‘borrower’ was obligated to return all cows to the owner, but were able to keep, raise and sell bull calves. The arrangement was assumed to be reciprocal and contributed to the communal recovery of the herd and lost asset accumulation.

region, it was difficult for them to obtain or accept a loan because of collateral risk. To encourage credit access and use, an NGO deposited security in the bank, but borrowing still required a combination of savings and collateral.

### Table 2: Risk Rationing, Quantity Rationing and Price Rationing

Table 2 summarizes published results from Kenya, Tanzania and Malawi; China; and Mexico, Peru, Honduras and Nicaragua. We see a significantly higher incidence of risk rationing in the African countries than in China or the Latin American countries. Price rationing is significant in all countries, but this simply means that respondent farmers are optimizing along their own credit demand curves. Balancing out the rationing measure is quantity rationing. Kenya and Tanzania are 10.3% and 13% respectively, but this pales in comparison to the risk-rationed group that may actually have a demand for credit but does not act upon that demand because of the collateral base.

As a concept, risk rationing has provided some guidance towards the development of insurance products that could ostensibly substitute for collateral. Earlier concepts, such as Bester (1987) used a simple economic concept that lenders could add a risk premium to cover collateral and default risks to a point where they would be indifferent to offering a risk-free loan at risk-free rates and a risky loan with risk-adjusted rates. Shee and Turvey (2012) took this further by tying the risk premium to a specific contingent claim that weighed heavily on the most common exogenous economic risk facing the farmers (e.g. market prices or specific weather events). The idea of collateral-free lending by bundling insurance with credit is sound within the confines of a theoretical economic framework but, as will be discussed presently, not so sound in an actual lending environment. Nonetheless, the idea of risk-rationing behavior being distinct from risk aversion is an important one since it recognizes, at least implicitly, that farmers consider balancing business and financial risks in making their decisions to use agricultural credit, should it be available.

## 7.2 Insurance

A third tranche of inclusive financial policies is the provision of insurance and the opening of insurance markets. While progress has been made in the area of micro insurance for life, property and casualty, the insurance of interest here is agricultural insurance. In this section we focus on two innovations in the agricultural insurance space that hold some promise for Africa, index-based livestock insurance (IBLI) and bundled credit or risk-contingent credit.

The role of insurance is becoming increasingly important in agricultural development. Marr et al (2016) reviewed 1,133 papers and reports on agricultural insurance and found several themes identifying key factors and indicators affecting insurance demand and uptake upon which most scholars and practitioners agree. The key factors and indicators are 1) *risk* (nature of risk, risk aversion, risk mitigation, basis risk, price risk); 2) *behavior* (understanding, trust and education) and 3) *credit and liquidity constraints* (credit access, wealth, liquidity and income).

However, insurance markets for hedging production risk arising from adverse weather or market price risks do not typically exist in Africa - especially for small producers; when they do, the inconvenience of obtaining the products via traditional insurance markets may be unattractive to producers. The risk landscape within agriculture in Africa creates a self-reinforcing credit rationing/disinvestment trap in the market with banks unwilling to lend and borrowers unable to invest in more efficient technologies. In the insurance sector, all-risk crop insurance that has been available in developed economies for decades has not materialized for a number of reasons, including yield measurement, scale, covariate risks, moral hazard and adverse selection. From a practical standpoint, crop insurance has not developed in Africa because the historical record of crop yields required to define risk probabilities is limited to non-existent. Adding to this, most farmers in Africa are small-scale farmers for which the administrative, monitoring, and underwriting costs are prohibitive. Covariate risks refer to common exogenous risks such as drought that affect all farmers in the risk pool at the same time. When these events happen, local insurers do not have the capital to indemnify the losses and must therefore involve global

reinsurance markets. Even if these issues could easily be resolved, insurers are also cautious about moral hazard and adverse selection, although these effects could be moderated through random audits of insureds to ensure compliance (Turvey, Hoy and Islam 2002; Esuola et al 2007).

To overcome these issues, scholars and practitioners have turned to '*index insurance*'. Index insurance is a generic term used to describe insurance models with an indemnity linked to an index rather than crop yields. Among the first of these index insurance models was area-yield insurance model proposed by Miranda (1991) and weather insurance to capture specific event risks (Turvey, 2001). While targeted towards volumetric risk, index models brought about a new element called basis risk in which the event measurement (average county yield or rainfall at a weather station) differs materially from the conditions faced by the insured leading to significant Type I and Type II error (Norton et al , 2013; Woodard and Garcia 2008). Although the implementation of weather-based index insurance models have been criticized on implementation and measurement (Binswanger-Mkhize, 2012), there are few alternatives to addressing small-holder insurance in Africa.

### 7.3 Index-Based Livestock Insurance (IBLI)

A variant index insurance model is the Index-Based Livestock Insurance (IBLI) which has been offered to pastoralist farmers in Kenya since 2010. IBLI is designed to protect livestock asset losses due to covariate rangeland conditions (rainfall) by providing uniform compensation based on signals and observations from satellite-based NDVI. NDVI, measure of vegetation required for grazing, is highly correlated with livestock mortality and was used to derive a mortality index. If the mortality index falls below a pre-stated threshold, farmers would receive an indemnity (Chantararat et al 2013; Woodard et al. 2016). The economic driver behind IBLI is the dynamic asset poverty trap when failures in sub-Saharan long and/or short rains decrease rangeland grazing, increasing livestock mortality. Post evaluation and simulations reported in Chantararat et al (2017), however, find that IBLI does not perform well for the poorest whose small asset endowment (camels) will typically collapse in the presence of a drought. However, IBLI does seem to be

effective for the vulnerable non-poor who might not see a total collapse in herd numbers and are then positioned to a more rapid re-accumulation of herds with IBLI indemnities in place. In addition to ex-ante assets (herd size) and asset dynamic being a key driver of IBLI uptake and benefits, they also find that the demand is quite elastic. As a commercial product, IBLI requires substantial loadings above the computed actuarial price, and this can dampen demand considerably. In willingness to pay (WTP), Chantarat et al (2017) report that fully loaded insurance would find demand only with herd sizes above 15 tropical livestock units (TLU), and additionally that the demand is highly elastic. To increase uptake of IBLI, even small subsidies on loadings could increase demand/uptake substantially. Finally, and in line with the Binswanger-Mkhize (2012) critique, they show that offering the maximum coverage is sub-optimal. Index insurance is designed to counter low-frequency, high-impact specific-events that are highly correlated with loss (Turvey, 2012).

#### 7.4 Insurance-Bundled Credit or risk-contingent credit

Considerable interest has also arisen in bundled or linked credit products. Bundled credit is a structured financial product with embedded collateral-like indexed-base risk transfer mechanisms in the form of insurance contracts or contingent claims (Skees and Barnett, 2006). As discussed above, two overarching conclusions are that farmers can improve productivity and household income; and collateral, moral hazard, and adverse selection results in the rationing (risk and quantity) of credit to farmers. The common element that bridges these two conclusions is risk, and the driving force behind bundled-credit products is to provide a mechanism that reduces business risk and collateral exposure to financial risks faced by both borrower and lender. Credit demand-supply endogeneity suggests that in balancing business and financial risks, borrower demand and lender supply could increase at a lower cost.

There is an emerging literature on bundled credit. Skees and Barnett (2006) describe the Indian MFI BASIX' purchase of rainfall insurance from the insurer ICICI-Lombard; how IBLI in

Mongolia could be used to reduce default risk on loans; and how insurers and reinsurers could use El Nino measures of surface ocean temperature to protect lenders from exposure to excessive rainfall risk (see also Miranda and Gonzalez-Vega, 2011 and Collier et al. , 2011). Carter (2011) examined the impact of linked credit on financial deepening and its impact on farm households; In Africa, Giné and Yang (2009) investigated an operating loan product in Malawi in which the payoff was determined by rainfall; Karlan et al. (2011) investigated the adoption of price-protected loans in Ghana. Shee and Turvey (2012) outlined how risk-contingent credit (RCC) could be used to indemnify loans for Indian pulse crop farmers. Banerjee, Duflo and Hornbeck (2014) deployed a RCT in India that encouraged a group of MFI borrowers to bundle life insurance with the credit, leading to an overall decrease in loan uptake.

Shee et al. (2015) report on games played with Kenyan pastoral and dairy farmers to uncover potential demand for risk-contingent credit. These ideas were operationalized in an RCT initiated in Machakos Kenya in 2017. Results of this RCT are reported in Shee, Turvey and You (2019) and Ndegwa et al. (2020). The RCT involved 1,170 randomly selected farm households. Risk-contingent credit linked to accumulated rainfall over the October 15 to January 15 long rain season was bundled with a loan originating with Equity Bank. Random assignment was for no loan offered, a traditional loan, and risk-contingent credit. A baseline survey collected self-identified risk, quantity, price and transactions costs rationing. They find that 48% of the households were price-rationed, 41% were risk-rationed, and 11% were quantity-rationed. The average credit uptake across the 819 farmers who were offered credit was 33%, with the uptake of bundled credit being significantly higher than that of traditional credit.

If bundled credit is to become part of the inclusive finance platform for African farmers, there are several important lessons coming out of this RCT. The first was that the uptake of traditional credit was nearly as high as the RCC 30% and 32% suggesting that linking credit to insurance might not be as strong as theory might suggest. There were some mitigating factors including the fact that the lender did require a full credit application as well as a pledge of



collateral, and the timing of the loan might have been late for some farmers. A second lesson related to risk-rationed farmers. As a conjecture, risk rationing suggests that uptake of RCC would be significantly higher than traditional credit. In fact the uptake was only 6.8% higher, but when it came to uptake of either traditional or RCC, there was no significant difference in the uptake by risk-rationed farmers.

Furthermore, a sub-experiment was conducted where 100 RCC borrowers were randomly assigned to 25%, 50% and 75% subsidies on the insurance costs. The results showed that while uptake was positive for 25% and 50% subsidies, they were not significantly different from zero, and with a 75% subsidy, the uptake was actually negative. This important result, even on a small sample, suggests that the demand for credit generally, and risk contingent credit specifically, is quite inelastic. In comparison to results reported in Chantarat et al (2017) who found an elastic insurance demand, this may not translate to bundled credit. There might also be a similar effect noted in Banerjee et al (2014) who found a drop in credit demand when insurance was added to the product. The parallel here was that farmers offered RCC could only borrow RCC, and farmers offered traditional credit had no option to take RCC.

## 7.5 Flexibility

Inflexibility can also be a barrier to the use of financial services. Laureti and Hamp (2011) state the poor need flexible financial products (savings, credit and insurance), but there is a tradeoff between flexibility and rigidity in the payment/repayment of financial products. Loan repayment provides grace periods that reduce the ordered discipline of rigid financial structures, or even the possibility of rescheduling loans in the face of exogenous natural adversity as is done by the Bank for Agriculture and Agricultural Cooperatives in Thailand. Weber and Musshoff (2013, 2017) speak to the issue of 'flex loans'. In their study of Madagascar MFIs, they compare flex loans with repayment balanced to the agricultural production (and liquidity) cycle to standard loans. The loans weren't perfectly tied to the liquidity cycle but were rather defined by repayment grace periods. They find a higher percentage of farmers accessed flex loans, but the loan amounts were lower

than those accessing standard loans. They also find that flex loans had a higher delinquency rate than standard loans, but not materially so. If innovative risk transfer products, whether linked to credit or not, are to succeed in sub-Saharan Africa, farmers ought to be offered choice and flexibility. Another example can be found in bundled credit. The original Kenya RCT discussed above was designed around a higher interest rate – a risk premium above the base rate – to absorb the costs of insurance. The lender would then transfer the insurance to the insurer on a pro-rata basis. Ultimately, the insurer required the payment be paid in full upfront and the insurance premium (about 13%) was added to the loan principal of 10,000 KSh. The flexibility of adding the insurance premium to the loan avoids problems raised by Casaburi and Willis (2018) who showed that liquidity constraints that prohibited Kenyan contract farmers from purchasing insurance could be alleviated if payment was deducted from the final contract payment. Chantarat et al (2017) issue a similar warning noting that insurance that consumes scarce resources, and fails to protect the household from catastrophic shocks, can do damage (Page 125).

Finally, flexibility should be added to index insurance design. Turvey et al. (2019) describes the failure of the Kenya RCC design to capture within-season basis risk. In the fall of 2017, early season rains exceeded the rainfall insurance threshold, but a late season drought caused significant crop losses. Indemnities were subsequently paid by project funds. In response, a new and flexible dynamic trigger was implemented with an indemnity paid if the accumulated rainfall in up to four non-overlapping 21-day periods fell below a percentage of the historical average. This new, flexible, design ensures that farmers receive some compensation if severe drought conditions arise across multiple stages of the production cycle.

## 7.6 Savings, Credit and Vulnerability

The role of savings in agricultural development is an important aspect of inclusive financial policies. Interest-earning savings accounts can increase household income, provide security against loss or robbery, and can provide financial collateral for obtaining credit. This is particularly

important in savings associations or self-help groups which can receive bank or MFI funds for group lending activities if a threshold of savings is met. The dynamic for individual borrowers is different from that of self-help groups since accumulated non-precautionary savings can substitute for credit. For example, Ankrah Twumasi et al (2019) investigate the Birim central municipality in Ghana. In a small sample of 141 households with access to credit and 75 that did not, they use IV-Probit model and found that savings mobilization has a positive significant impact on access to credit and the total amount of credit one can borrow as well.

With an overarching goal of addressing issues of vulnerability, the institutional structures of inclusive financial policies rely primarily on savings mobilization and access to credit to reduce farm/non-farm disparities and, ultimately, whether specific financial services or targeted policies are required. The highly endogenous nexus of savings-credit-vulnerability is not so clear cut, yet it is important to understanding the efficacy of inclusive financial policies. Using 2014 FINDEX data for Kenya, we investigated the credit-savings-vulnerability paradigm for farm and non-farm groups<sup>6</sup>. Because arguments can be made that credit-savings-vulnerability are self-endogenous we use a 3SLS approach with each being treated as endogenous variables. Our reasoning is that there are certain causal arguments that need to be made and investigated. For example, does savings drive credit demand, or does credit demand drive savings? What is the propensity of vulnerable households to save or borrow? These relationships are investigated in the three panels of Table 3. Although other control variables were used in the 3SLS regressions, we report only the endogenous variables and income quintile, and where the borrower holds an account at a FI. We group by all credit, formal credit, and informal credit, as well as farmer and non-farmer. The endogenous relationships were relevant and valid, and robust to different specifications of IV models which we do not report.

The upper panel in Table 3 is credit dependent (savings and vulnerability endogenous). None of the variables was significant at the 5% level of significance or better. This is a surprising

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<sup>6</sup> The econometric work presented here is drawn from Olson (2018).

result because it suggests that neither savings nor vulnerability are unique drivers of either formal or informal credit, and this holds for farmers and non-farmers alike. Credit use appears to be independent of income quintile status, and perhaps more significantly, having a formal account (access) does not necessarily imply increased use of formal credit (usage).

The middle panel in Table 3 - which is savings dependent - tells a different story . We find that households that are more vulnerable are less likely to save, and this is significant for non-farmers who indicate that they borrow informally. The savings behavior of farmers who indicated use of informal credit, and non-farmer and farmers, who indicated borrowing from a financial institution, does not appear to be affected by their vulnerability status. However, we do find a positive relationship between actual credit use and savings for all respondents and non-farmers using informal credit. This does not seem to be the case for farmers using informal credit or those using formal credit. We find higher quintile non-farm households use less credit generally, and this is also reflected in use of informal credit. Informal credit by farmers and formal credit does not appear to be related to savings. In terms of access to a bank account, this appears to translate into greater savings for non-farmers, but not for farmers. In other words, an access-to-usage linkage for savings appears only to hold for non-farm households.

### Table 3: Savings, Vulnerability and Credit

In the top panel, we found no statistical relationship between increasing vulnerability and credit use, however in the lower panel, we do find a positive affect for non-farmers' overall credit use, and non-farmer and farmers' use of informal credit . This suggests for at least these groups, those that borrow tend to be more vulnerable. However, we do find that Kenyan farmers that borrow formally tend to be less vulnerable. The dominant effect here is the role that informal lending plays. The combined results suggest that just because a household is vulnerable does not imply that they are more likely to borrow in the informal market, but there is an asymmetry in the sense that those who do borrow informally are more likely to be vulnerable. Both non-farm and

farm are negative for formal credit (only farmer is significantly different from zero) which suggests a possible substitution of formal for informal credit for the more vulnerable group. This could be familial, savings groups or moneylenders. Across all groupings we find that those who save are less likely to be vulnerable, and this is significant for all but the non-farm groups that tends to borrow from financial institutions. Across all groupings, we find a negative relationship between economic quintile and vulnerability, which relates income to vulnerability, but not in all instances. In fact, the results suggest that for the farmer group, vulnerability is independent of income. We do not find meaningful relationships between holding an account and vulnerability, although they are positive and significant in two instances.

## 8 Conclusions

This chapter provided an overview of agricultural credit and financial inclusion in Africa, but with limited focus. The reality is that each country has unique financial structures and programs with varying degrees of access and usage. There is significant variability between West and East Africa, and Northern and Southern Africa. This is evidenced by the heterogeneity in the common elements such as deposits, credit, mobile use or insurance discussed herein. Financial inclusion in Continental Africa has mixed impacts depending on country and region. A significant number of micro-studies across Africa concludes that there is a relationship between agricultural credit and agricultural productivity, and with respect to insurance outcomes look promising except, perhaps, for the very poor. The very poor need specifically targeted policies that could include subsidies.

These observations are in line with the meta-review by Van Rooyen et al. published in 2012 who found up to that point in time that specific elements of microfinance seem to work in specific contexts, but the complexity of poverty and the various types of interventions make broad generalizations difficult. Ultimately because of certain findings that microfinance can at times increase poverty, reduce levels of children's education, and disempower women, they advise against the promotion of microfinance to meet the Millennium Development Goals. Our analysis is

not positioned to reach such a conclusion. Indeed, if inclusive financial policies targeted to agriculture in continental Africa are viewed more broadly than microfinance as it is traditionally used, specific targeting of insurance, credit products, flexibility, regulatory policy and oversight and the adoption and use of cellular and mobile technologies do appear to be inclusive, at least at the meso or macro level. Flexibility appears to be important and some sense of balance between farmers' demand for credit and lenders' willingness to supply. For example in Choice Experiments run by Shee, Turvey and Marr (2020) in Machakos Kenya for linked credit, it was found that there were conflicting demand and supply side preferences for credit term, collateral requirement, and loan use flexibility. For example, while long-term loans were preferred by farmers, they were not preferred by finance providers. Farmers preferred medium term credit while suppliers preferred short term credit; no collateral loans were preferred by farmers whereas collateral was strongly preferred by suppliers; farmers prefer loans to be used for any purpose (fungibility) while suppliers preferred loans only for agricultural production purpose. Inclusive finance is therefore not an absolute that can be dictated in market economies, but a balance, or equilibrium, between borrowers and lenders with competing interests. What becomes clear is that the disparate economic and political characteristics of African countries, combined with natural resource endowments, topography and climate zone makes the notion of a one-size-fits-all financial policy all but impossible, at least for credit and insurance. Mobile and cellular technologies should avoid problems of space, climate and topography, but the high adoption and usage of mobile technologies in Kenya relative to other sub-Saharan countries is anomalous.

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Table 2: Summary of Policies to Support Financial Depth, Breadth, Access, and Usage

	X
Financial Depth	<ol style="list-style-type: none"> <li>1. Expand deepening Large Commercial Banks/policy banks, Joint-stock commercial banks, village and community banks, Rural Financial Institutions, Savings and Loans, private (greenfield) development banks, Islamic banks, Government Sponsored Enterprises</li> <li>2. Financial deregulation to increase competition, lower deposit/savings interest rate spreads</li> <li>3. Improve oversight on regulatory performance and monitoring of capital adequacy and capital controls (e.g. Value at Risk)</li> <li>4. Ease restrictions on bank holdings of government debt</li> <li>5. Create specialized financial institutions for agriculture and related industries</li> </ol>
Financial Breadth	<ol style="list-style-type: none"> <li>1. Expand licenses for deposit –taking and lending-only companies</li> <li>2. Provide tax incentives to financial institutions increasing agricultural loans to underserved and poverty markets</li> <li>3. Promote MFIs and group lending activities</li> <li>4. Relax Know Your Customer (KYC) regulations for small MFIs, savings associations</li> <li>5. Encourage FI-cooperative and FI-value chain agency relationships</li> <li>6. Provide government guarantees to FIs entering high risk areas</li> <li>7. Encourage agent banking through kiosks, retail stores, pharmacies and post offices for simple deposits and withdrawals.</li> <li>8. Expand lender-borrower agency relationships to assist in Village funds, agricultural cooperatives</li> <li>9. Establish cooperatives and other rural financial institutions that are regulated by respective Ministries of Agriculture rather than Central Bank</li> <li>10. Develop national micro-insurance schemes to offset business risks</li> <li>11. Promote agricultural crop, livestock, and weather index insurance for agriculture at the local and catastrophic levels.</li> <li>12. Access global reinsurance markets</li> </ol>
Access	<ol style="list-style-type: none"> <li>1. Expand branches (national, village or county banks) into rural areas and poverty zones with deposit and lending services</li> <li>2. Develop and promote credit worthy or credit scoring registries and models to reduce asymmetric information</li> <li>3. Expand cellular and internet broadband services and infrastructure to rural areas</li> <li>4. Innovative and accessible services: <ol style="list-style-type: none"> <li>a. Branchless banking</li> <li>b. E-money and Mobile banking</li> <li>c. Point-of Sale terminals</li> <li>d. Television and internet banking</li> <li>e. Government backed small business loans</li> </ol> </li> <li>5. Expand locations of ATMs to rural areas</li> <li>6. Expand access to property/casualty insurance</li> <li>7. Encourage liquidity matching of loans and payments through flex loans</li> <li>8. Encourage insurance-linked credit products to balance business and financial risks at the micro, meso, or macro economic levels</li> </ol>
Usage	<ol style="list-style-type: none"> <li>1. Promote establishment of bank accounts</li> <li>2. Promote savings and secured deposits in formal institutions</li> <li>3. Expand financial education</li> <li>4. Reduce collateral requirements</li> <li>5. Encourage group guarantees</li> <li>6. Expand technology transfer and extension services to promote investments in production</li> </ol>

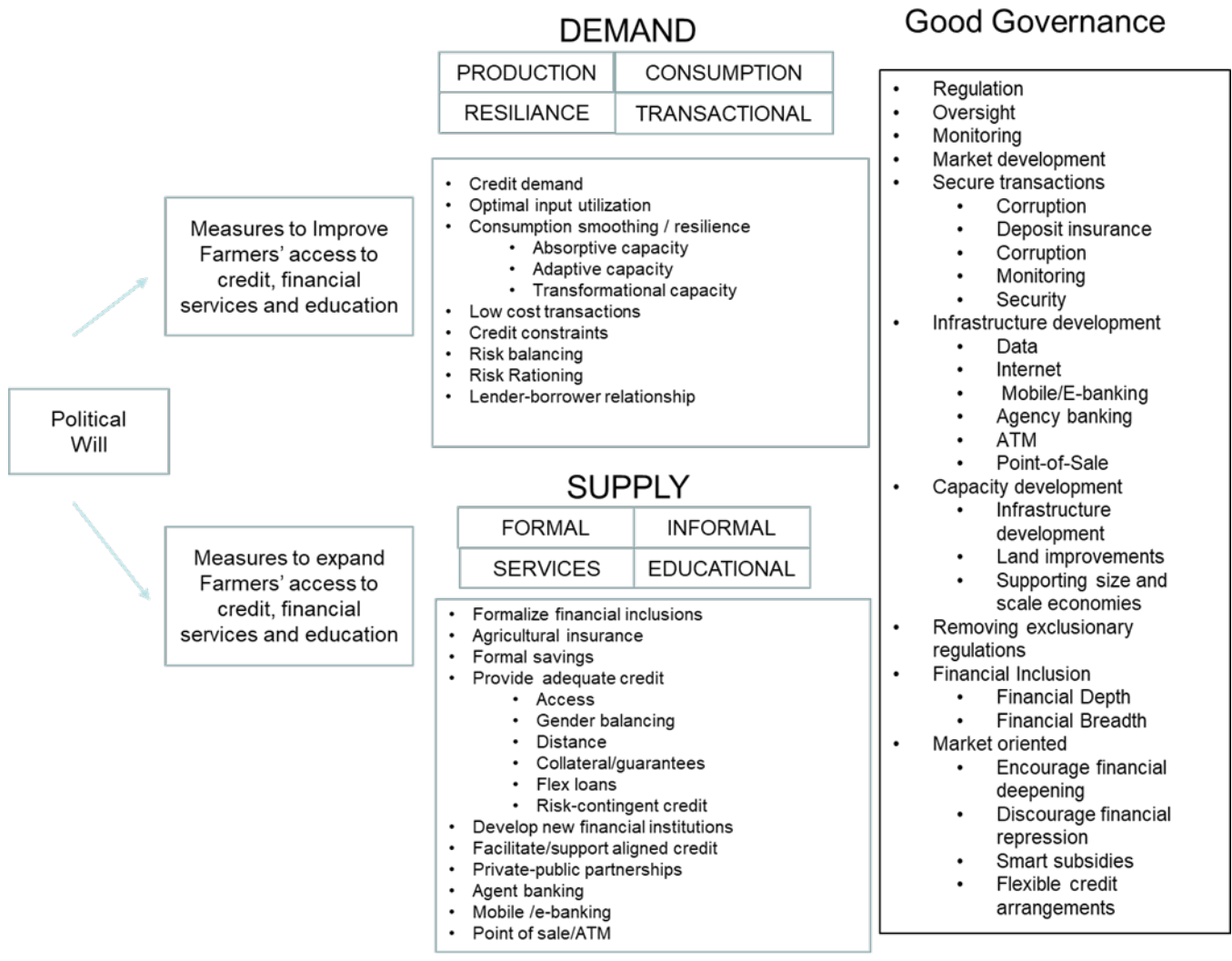


Figure 1: Schematic of Financial Development

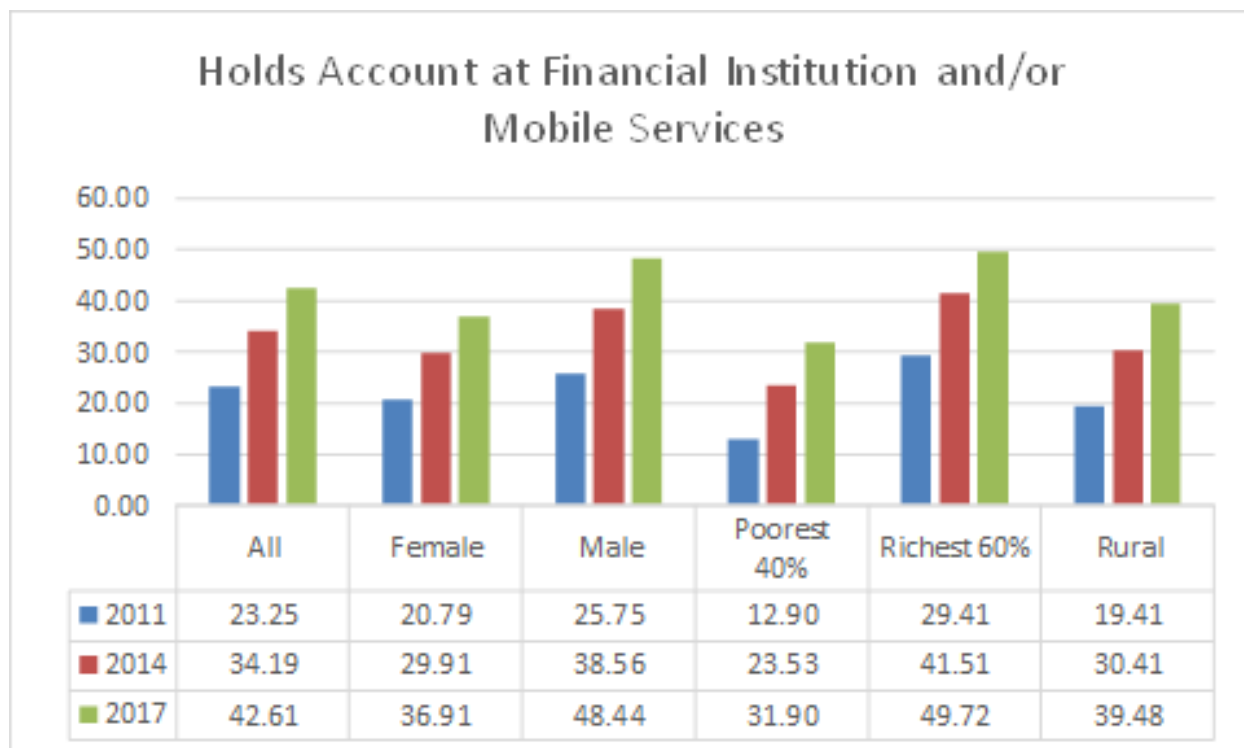
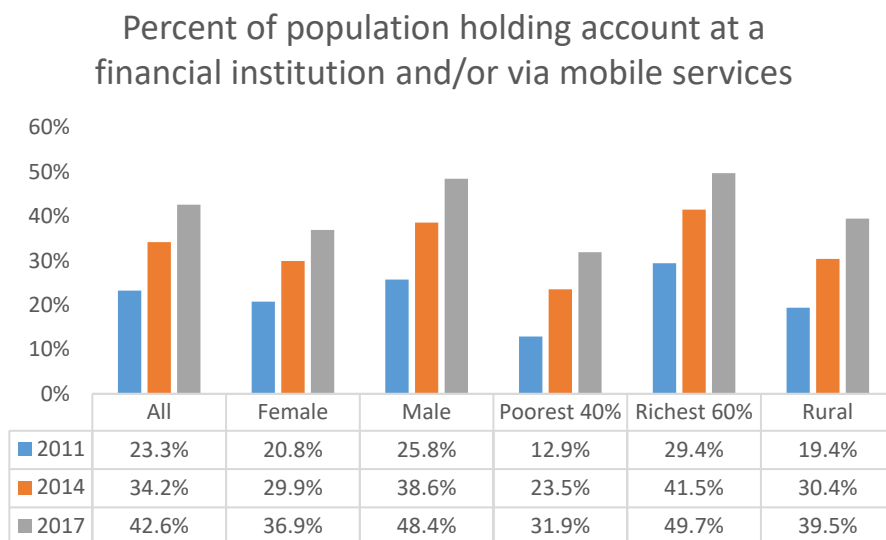


Figure 2: Accounts at Financial Institutions and Mobile Services, Sub-Saharan Africa: Source Global Findex Database, 2017





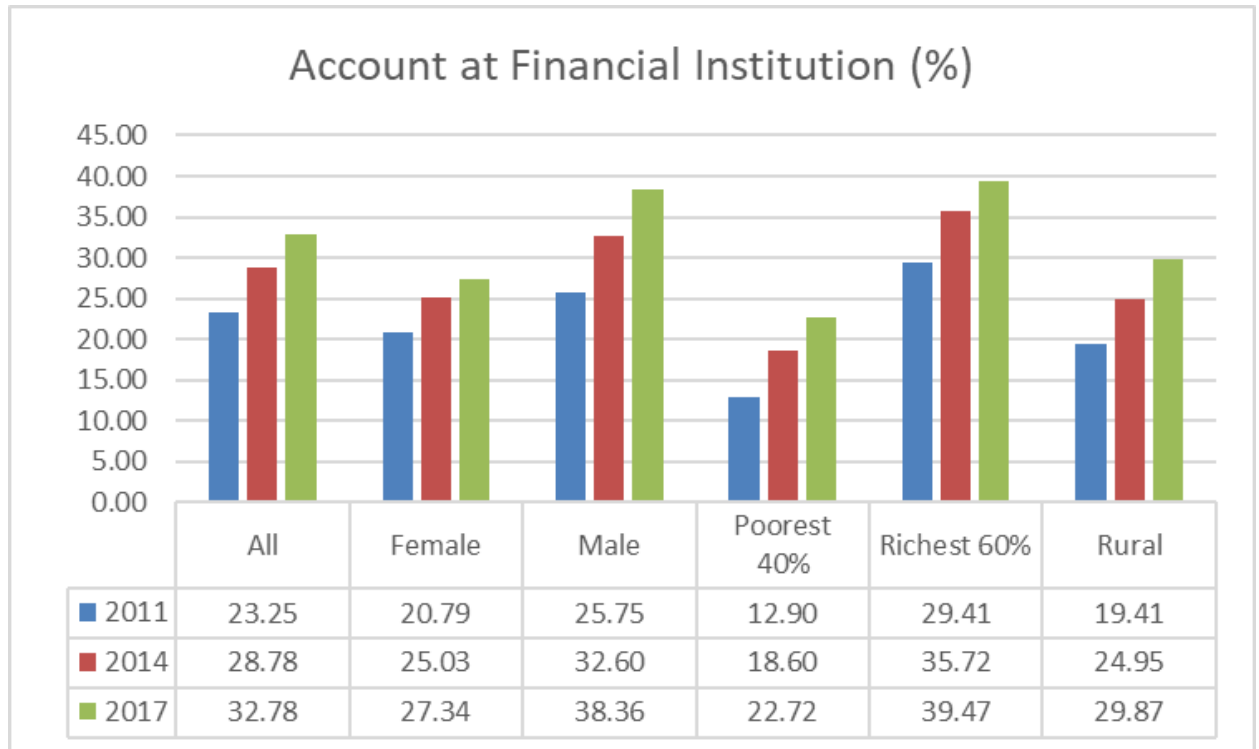
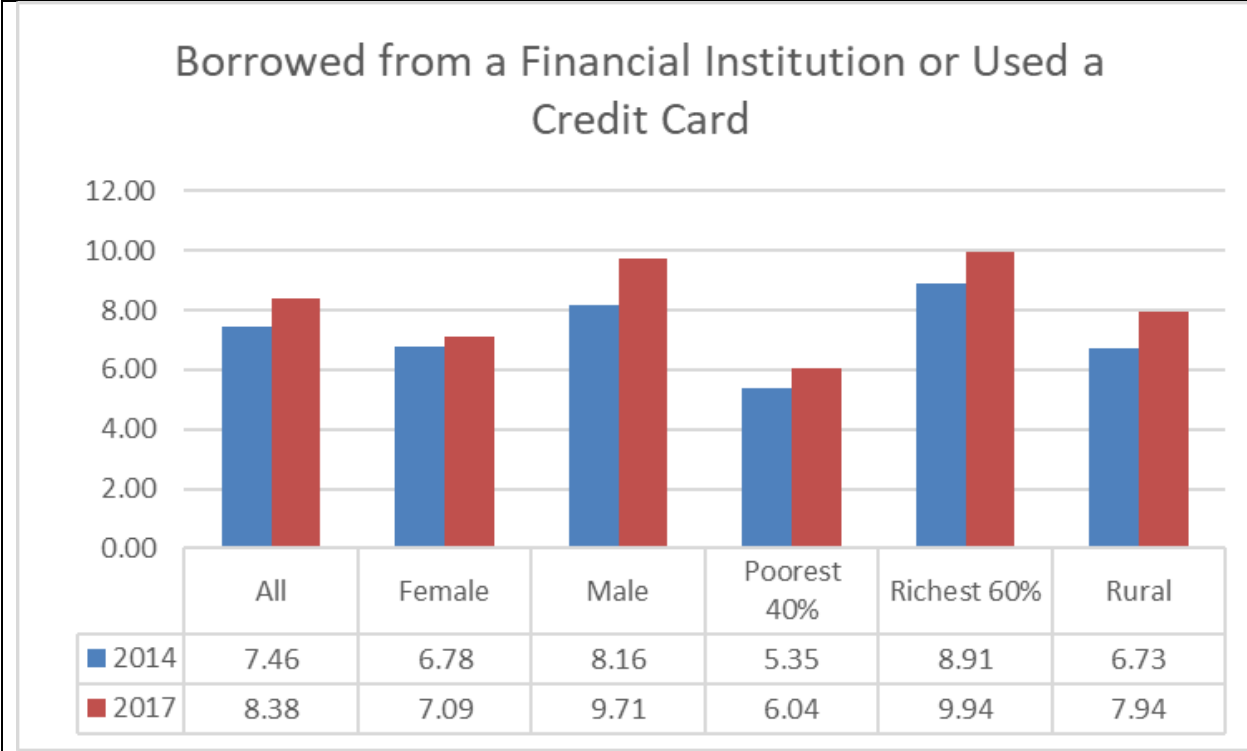
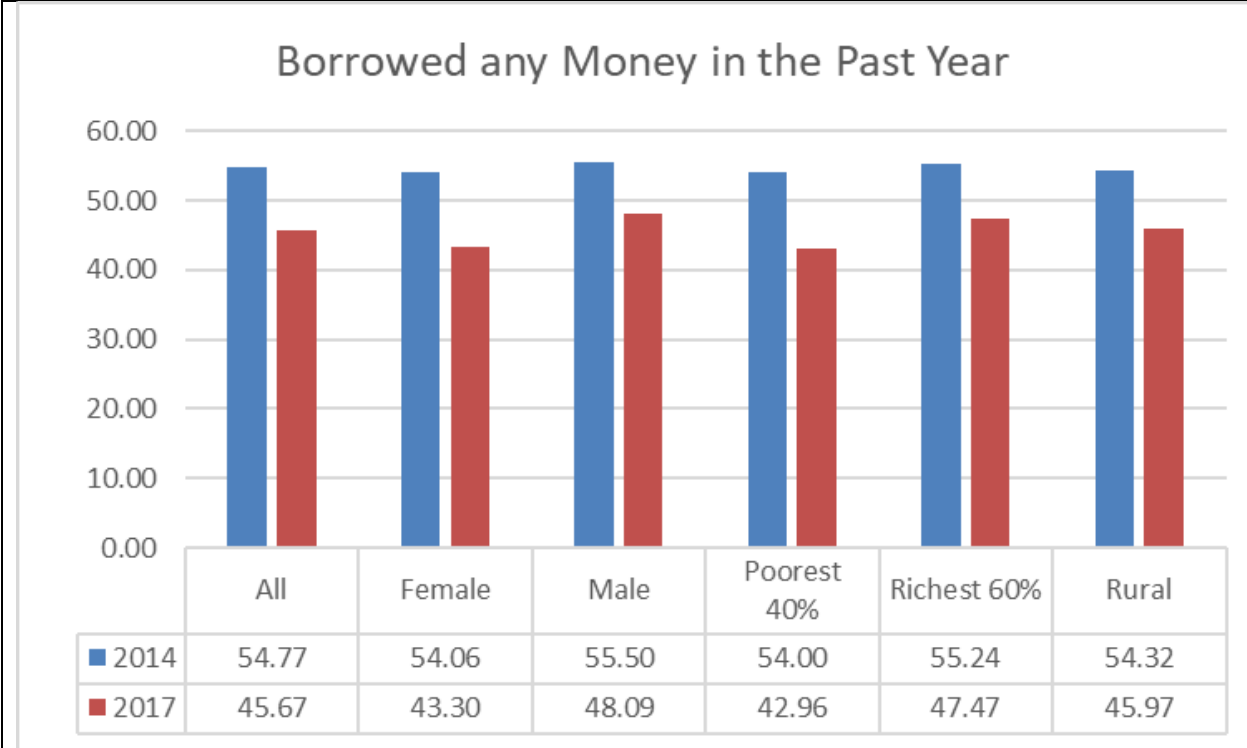


Figure 3: Holding Accounts at Financial Institutions



**Figure 4: Borrowing Access and Usage, Sub-Saharan Africa**

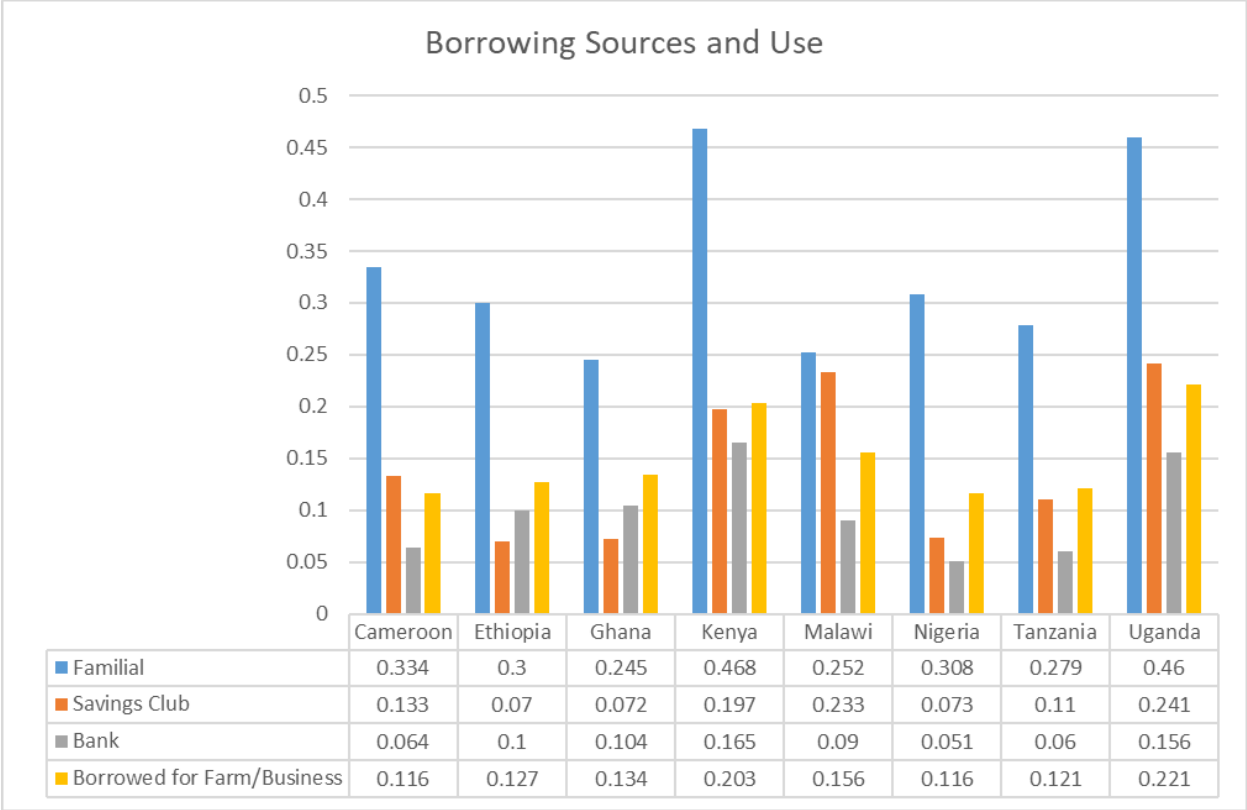


Figure 5: Sources of Credit by Country

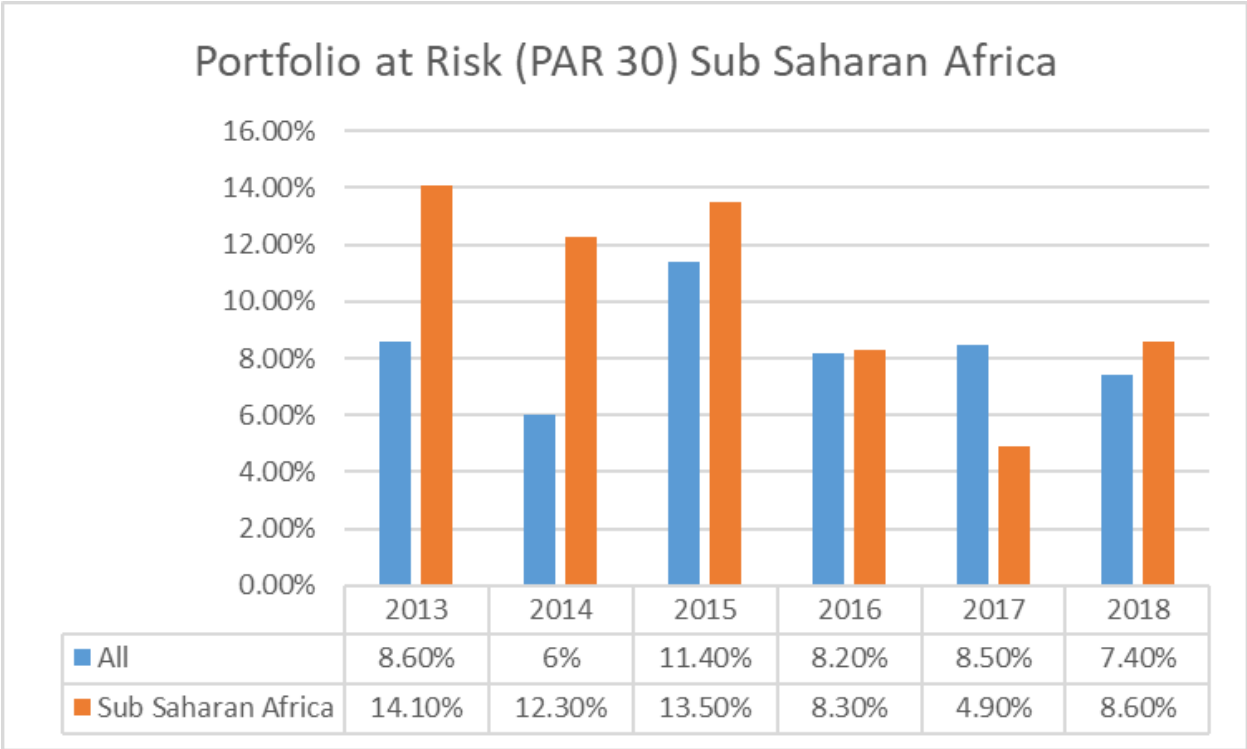


Figure 6: Portfolio Risk, sub-Saharan Africa

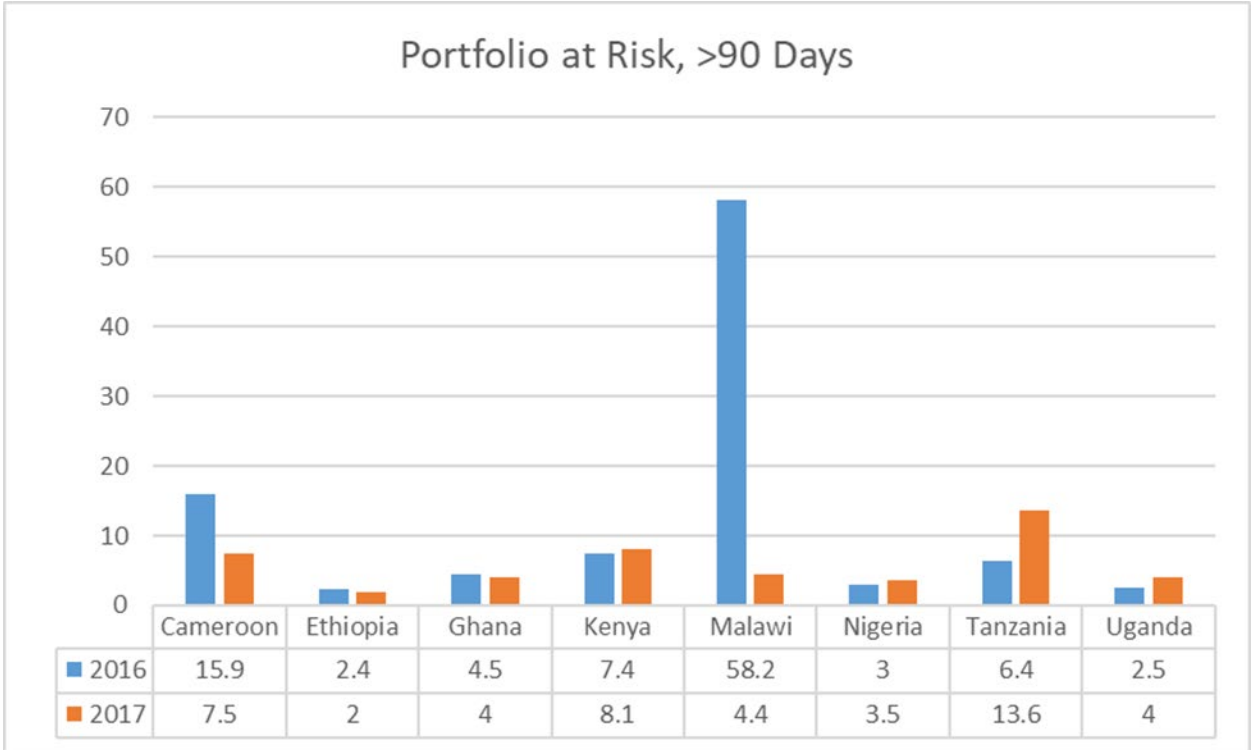


Figure 7: Value at Risk, PAR30 by Country

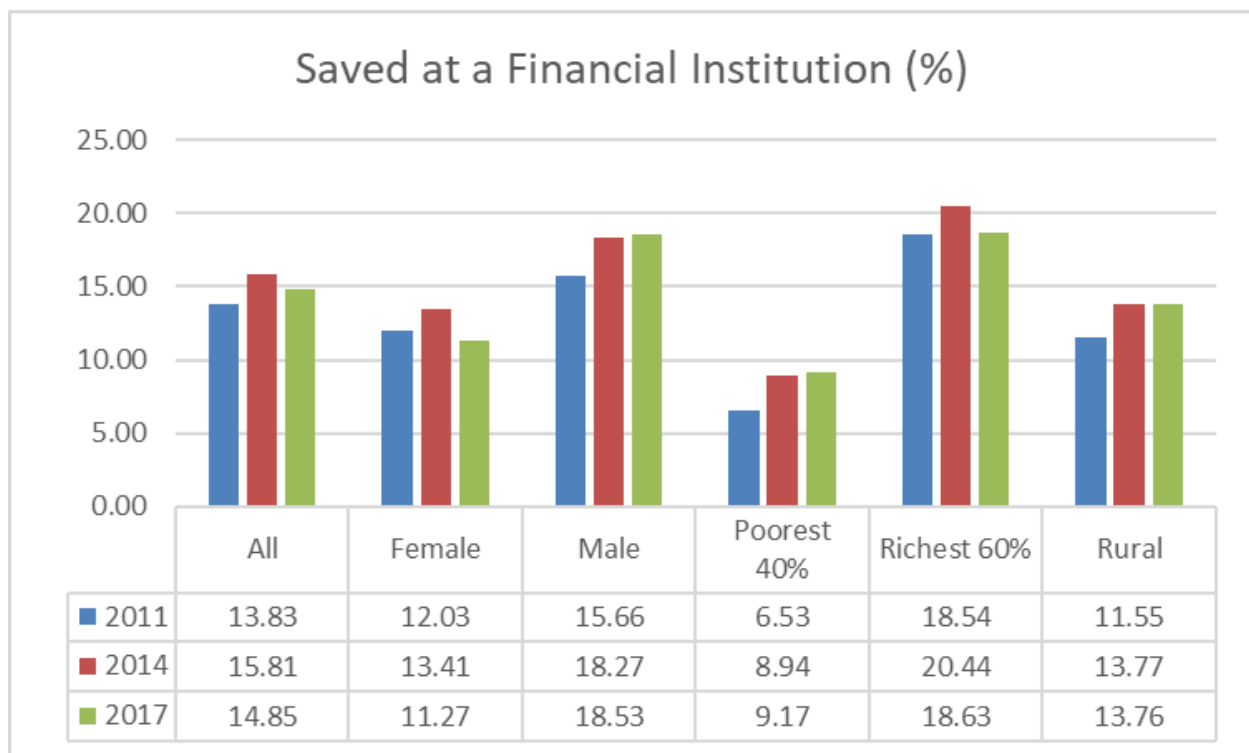


Figure 8: Savings at Financial Institutions in Sub-Saharan Africa (%)

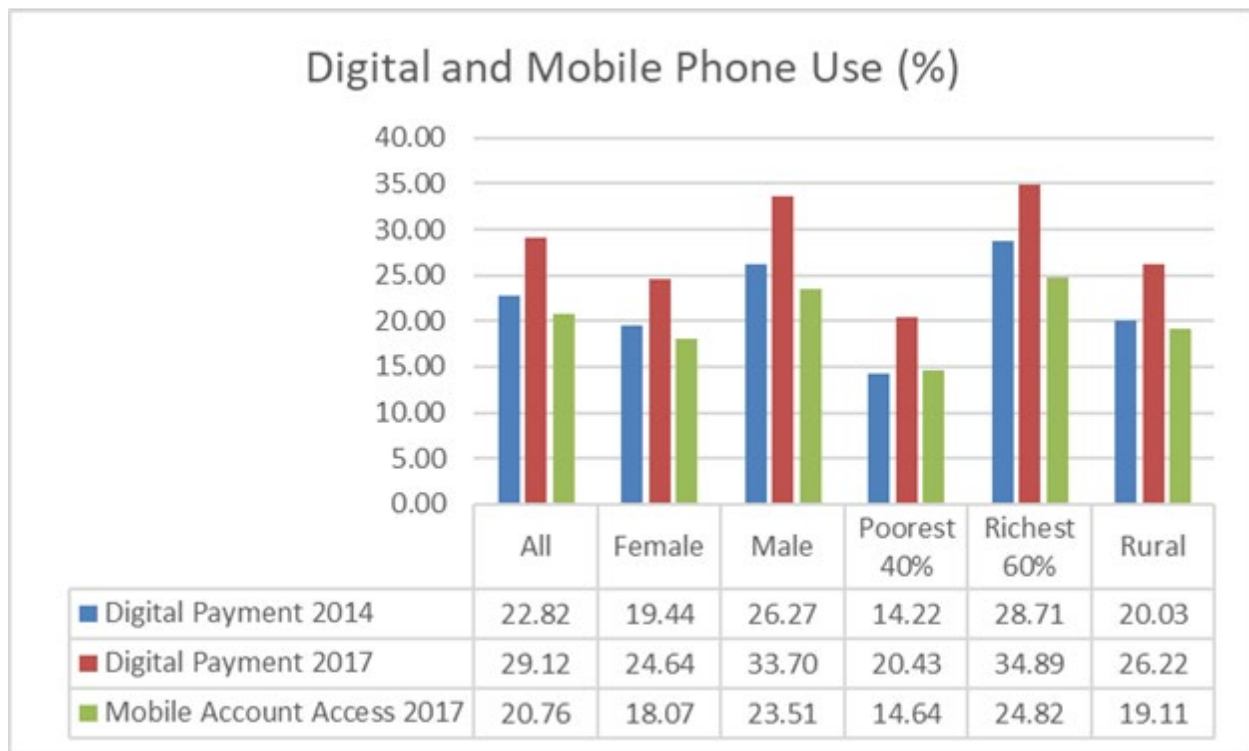


Figure 9: Digital and Mobile Phone Use, Sub-Saharan Africa

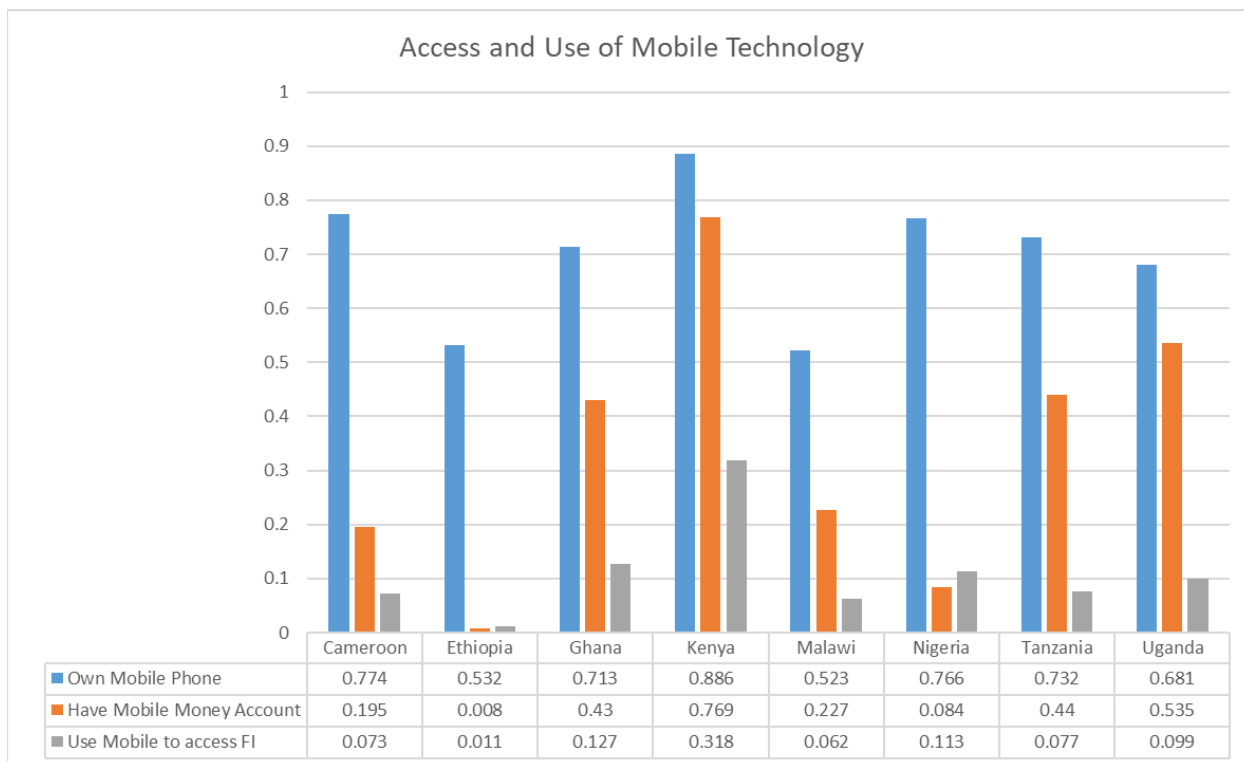


Figure 10: Access and Use of Mobile Technologies by Country

**Table 3: Risk Rationing, Quantity Rationing and Price Rationing**

Country	Risk Rationed (%)	Quantity Rationed(%)	Price Rationed (%)
Kenya (a)	38.4	10.3	51.3
Tanzania (b)	57	13	40
Malawi (c)	38	12	50
China (d)	6.5	14	85
Mexico (d)	35	10	55
Peru 1992 (e)	8.6	36.6	54.9
Peru 2003 (e)	22.4	10.4	67.3
Peru (f)	19	37	46
Honduras (f)	16	23	62
Nicaragua (f)	12	48	40

(a) Shee, Turvey, You (2019); (b) Shee, Pervez, and Turvey (2018); (c) Baseline survey data-DualCassava Project at NRI ;(d) Verteramo-Chiu et al (2015); (e) Boucher, Guirkingner and Trivelli (2006); (f) Boucher, Carter, Guirkingner (2008)

Table 4: Savings, Vulnerability and Credit

	All Credit Non- Farmer	Farmer Credit Use	Informal Credit Non- Farmer	Farmer	Formal Credit Non- Farmer	Farmer
Savings	0.491	0.549	0.471	0.419	0.0643	0.374
Vulnerability	2.872	1.193	1.899	1,965	2.384	-0.514
Quintile	0.191	0.0209	0.137	0.02014	0.143	31
Account	0.275	0.191	0.244	0.545	289	-0.019
		savings				
Vulnerability	-0.749 ***	-0.588 ***	-0.844 ***	-0.58	-0.224	-1.98
Credit Use	0.499 *	1,091 **	0.526 *	0.621	0.59	-3.083
Quintile	-0.669 **	-0.0207	-0.0755 **	- 0.00653	-0.0299	- 0.00251
Account	0.178 **	0.0682	0.165 **	0.147	0.242 ***	0.476 *
		Vulnerability				
Credit Use	0.586 *	1.199	0.597 *	1.086 **	-0.612	-1.338 *
Savings	-1.104 ***	-1.752 ***	-1.053 ***	-1.433 ***	-0.492	-0.635 *
Quintile	-0.0846 ***	-0.0282	-0.0869 ***	- 0.00822	-0.0695 ***	- 0.00294
Account	0.184 *	0.272	0.16	0.167	0.134	0.276 *