

Financial inclusion, shocks and coping strategies: survey evidence from Uganda

Joseph Maweje
The World Bank, Juba, South Sudan

Abstract

Purpose – The purpose of this paper is to investigate the roles that access formal and informal finance as well as mobile money play in facilitating the choice of coping strategies that households adopt.

Design/methodology/approach – The research methodology considers the estimation of binary outcome maximum likelihood probit models for each coping strategy on a vector of covariates that include measures of financial inclusion, household characteristics and community variables.

Findings – The author finds that financial inclusion is associated with a higher likelihood of adopting market-oriented strategies such as selling assets or borrowing and lower likelihood for non-market strategies such as reliance on informal networks and reducing consumption.

Originality/value – To the best of the author's knowledge, this paper provides the first empirical attempt examining the pathways through which financial inclusion may facilitate the choice of coping strategies using nuanced household data.

Keywords Financial inclusion, Shocks, Coping strategies, Uganda

Paper type Research paper

1. Introduction

Many households in developing countries are faced with increasing risks and shock occurrences. Armed with poor coping strategies and weak resilience mechanisms, the effects of such shocks are often excruciating and have far reaching consequences resulting in large welfare losses (World Bank, 2014). Consequently, many households continue to suffer debilitating effects of various shocks. Shocks, vulnerability and coping have attracted much attention, and there is now a voluminous amount of literature on the kind of coping strategies that households adopt to limit their full effects on welfare (see e.g. Heltberg *et al.*, 2015; Börner *et al.*, 2015). The most commonly studied strategies include increased deviation from primary livelihood activities in a bid to diversify income sources (Barrett *et al.*, 2001), reduced consumption (Dercon *et al.*, 2005), reliance on social capital (Maweje and Holden, 2014) and smoothing assets (Hoddinott, 2006).

There is an emerging strand of literature showing that financial inclusion matters for household welfare and resilience to risks and vulnerabilities (Lensink *et al.*, 2017). Generally, available literature shows that constrained access to financial markets precipitates sub-optimal responses to shocks that may include, among others, distress liquidation of productive assets (Rosenzweig and Wolpin, 1993), adoption of inferior cropping strategies (Dercon, 1996) and precipitation of child labor (Beegle *et al.*, 2006). In addition, recent research shows that expansion of mobile phone-based payment systems present new possibilities for more efficient risk management (Riley, 2018). However, the pathways linking financial inclusion to risk management are less understood. This paper seeks to address this gap in the literature by examining the channels through which financial inclusion facilitates the choice of coping strategies.

Financial inclusion provides mechanisms for managing risk by facilitating the development of formal insurance markets as well as informal risk sharing networks (World Bank, 2014). However, efforts to expand financial inclusion, particularly in sub-Saharan Africa, have been undermined by the limited penetration of formal financial and insurance products, prohibitive



user fees and limited financial literacy (Allen *et al.*, 2014). Consequently, large proportions of the population, particularly women and the poor, continue to be excluded from the formal financial system (Demirgüç-Kunt *et al.*, 2014), and financing constraints pose large constraints on business growth (Mawejje and Sebudde, forthcoming).

This study examines the specific roles that access to formal and informal finance as well as mobile money play in facilitating the choice of coping strategies that households adopt. In doing so, the paper contributes to the literature on inclusive finance and vulnerability. Specifically, by focusing on the covariates of coping strategies, the paper contributes to a better understanding of the importance of financial inclusion in the determination of resilience paths in the aftermath of adverse shocks. From a policy perspective, it is interesting to examine whether financial inclusion improves resilience to the extent that households can adopt superior risk management strategies that do not compromise both current and future welfare.

Results indicate that financial inclusion increases the likelihood of households adopting market-oriented strategies such as selling assets or borrowing of any form (formal or informal) and reduce the likelihood that a household will rely on non-market strategies such as reliance on informal networks and reducing consumption. The effects of financial inclusion are mediated by the differentiated effects of access to credit, savings and transfers. The rest of the paper is organized as follows: Section 2 presents the literature review; the estimation strategy is presented in Section 3; Section 4 introduces the data; and econometric results are discussed in Section 5. Section 6 concludes with policy implications.

2. Literature review

The literature examining the importance of financial inclusion in household risk management is scanty but evolving. Generally, available literature shows that constrained access to financial markets precipitates sub-optimal responses to shocks. Rosenzweig and Wolpin (1993) showed that distressed households faced with credit market constraints frequently liquidate their productive assets to smooth consumption during periods of income uncertainty. In another study on Tanzania, Dercon (1996) showed that financially excluded agrarian households responded to risk by adopting low yield risk crops with low economic return and low protein content with implications for food insecurity and malnutrition. Evidence from elsewhere shows that financially excluded households may precipitate child labor at the expense of long-term human capital accumulation (Beegle *et al.*, 2006).

The formal financial system plays a crucial role in helping households cope with both covariate and idiosyncratic shocks. The World Bank (2014) identified eight risk management financial tools that include: payment and foreign exchange services, saving instruments, credit; market insurance, debt and equity investments, risk-taking capital, public trading of assets and risk pricing information. Each of those tools can only manage certain risks efficiently, based on their frequency, intensity and impact. Various scholars have shown that households that can draw on savings, participate in the credit markets or purchase insurance have better capabilities to cope with various shocks (see e.g. Demirgüç-Kunt *et al.*, 2014; Lensink *et al.*, 2017).

However, where households do not have access to formal financial and insurance markets or where such markets have not developed, are missing or incomplete, households have been shown to rely on endogenously evolved risk sharing networks. Within this realm, Bloch *et al.* (2008) study the bilateral insurance schemes that enable transfers and information across networks of individuals thus enabling households to mitigate or cope with the adverse effects of shocks. Similarly, Fafchamps and Gubert (2007) examine the formation of rural risk sharing networks in developing countries

with a particular focus on the Philippines. They found that differences in household characteristics including age and wealth as well as the social (kinship) and geographic proximity are important determinates of intra-village mutual insurance links.

Urrea and Maldonado (2011) studied the effects of savings, access to credit and insurance on vulnerability to income shocks in Colombia. Using matching propensity score methods, they showed that households with access to a menu of financial tools are less vulnerable to income shocks. Alvi and Dendir (2009) showed that both private transfers and informal loans supplement low and uncertain incomes in helping poor urban Ethiopian households manage risks and shocks. However, only transfers were shown to respond to observable measures of vulnerability. These findings lend credence to earlier work by Fafchamps and Lund (2003), who similarly showed that informal exchanges/transfers (such as gifts) and informal loans respond to shocks in rural Philippines.

Carlson *et al.* (2015) used household-level panel data to examine the role of access to financial inclusion for risk sharing in Nigeria. They show that financial inclusion increases the resilience of households that have encountered an unexpected shock which severely impacts income. In particular, they show that households with financial inclusion access experience fall in consumption of 15 percentage points less than those that are excluded. Likewise, Lensink *et al.* (2017) found that memberships to savings and credit associations reduce vulnerability and income variability in Mexico.

The recent expansion of innovative financial products, including mobile money, provides new platforms for managing both covariate and idiosyncratic shocks (Riley, 2018; Jack and Suri, 2014). This has been made possible by the rapid penetration of mobile phone technology which has eased communication costs and helped households reduce the amount of time spent on transactions, thus enabling people to make swifter responses to income shocks (World Bank, 2014). For example, information about markets, weather, better agricultural technologies and employment prospects improves the ability of a household to prepare for and respond to risk. Indeed, Jack and Suri (2014) showed that access to mobile money services fully insures households against adverse shocks in Kenya via the remittances channel.

Similarly, Jack *et al.* (2013) used panel survey data collected in Kenya to investigate the characteristics of interpersonal mobile money transactions. They found that use of mobile money (M-PESA) precipitated the volume of internal remittances with a strong likelihood for reciprocity. In addition, they found that households with access to mobile money report relatively more credit and emergency-related transfers than non-users. This evidence points to the importance of mobile transfers for informal insurance arrangements.

3. Data sources

This study uses the 2013 FinScope survey data for Uganda. The survey was based on a two-stage stratified random sampling design. In the first stage, the selection was based on a region and by a stratum (urban/rural). In each stratum, the primary sample unit was the enumeration area (EA) and was selected systematically using the probability proportion to size procedure within each stratum. The second stage of stratification was the EA, which was the ultimate sampling unit. A total of 4,032 households were selected using the 2012 Uganda Population and Housing Census mapping frame. EAs were allocated into the five regions (East, West, North, Central and Kampala) as explained earlier. A total of eight households were randomly selected from each EA. From each household, one adult member aged 16 years and above was selected to participate in the survey; this was done using the KISH grid method. Data were collected at both the individual and household levels.

Data are available for 3,401 households with complete information which translates to a completion rate of 84 percent. The sample was designed to provide financial indicator

estimates that are representative for lower levels of rural/urban areas and for the five regions. Data were collected providing detailed demographic information of the adult population (individuals aged 16 years and above), socio-economic characteristics, and use and non-use of financial services.

Particular information collected included the following: financial and risk management strategies; financial discipline and knowledge; attitudes and perceptions of, as well as preference for, financial service providers; usage and attitude to mobile money technology; rural and agriculture issues; remittances; and asset accumulation patterns. Of equal and great importance, the survey collected data on shocks and coping strategies. In particular, the survey requested the respondents to indicate whether their households experienced shocks in the past 12 months prior to the survey that might have, in turn, negatively impacted on their incomes. The survey also requested for the coping strategies that households adopted in response to shocks.

Shocks are defined as any events during the last 12 months which negatively affected household income or wealth. While households can choose from a menu of shocks, we categorize economic shocks, natural shocks and health shocks. In this respect, economic shocks include: theft, demolition, price shocks or events that negatively affected livestock and crops; natural shocks include: drought, floods, thunder and fire; and health shocks include: ill health or death of a family member.

Households can choose from a list of alternative coping strategies that include: sell assets; borrow from a formal institution; borrow from informal institution; borrow from friends and family; take a salary advance; borrow from money lender; seek donations from neighbors, relatives and friends; claim from insurance company; reduce consumption; and others. These coping strategies are reduced to six broad categories that include: (1) sell assets, such as land and livestock; (2) borrow from formal institutions which was constructed to include borrowing from banks, non-bank formal institutions and claims from insurance companies; (3) borrow from informal institutions which was constructed to include money lenders, employer salary advances and borrowing from friends and family; (4) social networks which include seeking donations from neighbors, family and friends; (5) reduce consumption; (6) other coping strategies, which include all other strategies not reported in 1–5 above. These strategies can broadly be thought of as either market or non-market-oriented. It is worth noting that responses for coping strategies were not mutually exclusive.

4. Estimation strategy

The literature identifies various econometric approaches that may be used to model household choice of *ex post* coping strategies in response to some negative shock. Popular among the methods is the estimation of multinomial logistic models to identify the factors that are associated with choice of coping strategies to shocks (see e.g. Börner *et al.*, 2015). The multinomial logistic approach requires the choice of strategies to be mutually exclusive. Crucially, the independence of irrelevant alternatives (IIA) assumption requires that excluding or including an outcome variable should not affect the odds among the remaining categories.

However, our data are not suited to this type of approach because the choices are not mutually exclusive. Households were asked to select “all” coping strategies they applied without necessarily ranking them. In this case, the validity of the IIA assumption would be violated. For this reason, we proceed by estimating binary outcome maximum likelihood probit models for each coping strategy on a vector of covariates that include measures of financial inclusion, while controlling for specific household as well as community characteristics. This approach is considered suitable and has been used elsewhere to examine shocks and choice of coping strategies (see e.g. Yilma *et al.*, 2014; Modena and Gilbert, 2012).

We make two assumptions with regard to the coping strategies: first, households look out for better coping mechanisms even if they have adopted one already; and, second, current household situations dictate the choice of adaptation strategy. Therefore, it follows that a household chooses a coping strategy that yields the highest utility, or, to put it differently, a household opts for a new coping strategy if the utility derived from the current strategy is lower than the available alternative.

To fix ideas, suppose that a household can choose between J alternatives, indexed $j = 1, 2, \dots, J$, noting that the order is arbitrary. A household i attaches a utility level to each strategy j given by U_{ij} . The alternative j is chosen if and only if it provides the highest utility, that is if $U_{ij} = \max\{U_{i1}, U_{i2}, \dots, U_{iJ}\}$.

The probability that strategy j will be chosen is given by the expression in the following equation:

$$\theta_{ij} = \Pr(Y_j = j) = \Pr(U_{ij} \geq U_{ik}) \text{ for } j \neq k. \quad (1)$$

The utility choice of j is modeled as $U_{ij} = H_{ij} + \varepsilon_{ij}, \forall j$, where $H_{ij} = x\beta_j$ is the linear predictor and ε_{ij} is a random error term that is assumed to be independently and identically distributed.

In the multivariate probit model, the probability that a coping strategy j is chosen will be determined by the expression in the following equation:

$$\Pr(Y_j = 1 | x_i) = \Phi(X' \beta), \quad (2)$$

where: Φ represents the standard normal cumulative distribution, x is a vector of covariates and β is a vector of parameters to be estimated. However, the β coefficients are not easy to interpret. Therefore, to more accurately interpret the parameter coefficients from the probit models, we compute the marginal effects by taking the partial derivatives of the specification in Model (2) above. The marginal effects model that we estimate is specified in the following equation:

$$\frac{\delta \Phi(x'_i \beta)}{\delta x_{ij}} = \phi(x'_i \beta) \beta_j. \quad (3)$$

The vector of covariates includes three classes of variables including: household characteristics, such as respondent age, household size, marital status, employment status, education level and wealth status; community-level characteristics such as: place (rural/urban) and region of residence, distance to community infrastructure such as roads, markets; and financial inclusion variables that include access and use of formal financial institutions, non-formal financial institutions and mobile money.

The multivariate model that we estimate to examine the correlates of coping strategies is specified in the following equation:

$$P(Y_i = 1 | x_j) = \alpha_j + \beta_j X_{ij} + \gamma_j C_{ij} + \varphi_j Z_{ij} + \varepsilon_{ij}, \quad (4)$$

where $P(Y_i = 1 | x_j)$ is the probability of a household employing a coping strategy j on the basis of information contained in the vector of covariates x ; X_{ij} is a vector of household characteristics; C_{ij} is a vector of community characteristics; Z_{ij} represents a vector of financial inclusion variables; and ε_{ij} is an error term that is assumed to be identically and independently distributed.

The major thrust of the analysis in this paper is to examine the effect of the financial inclusion variables Z_i on the types of coping strategies that households adopt. If financial inclusion indicators are significant predictors of coping strategies, the

coefficients φ_j are expected to be non-zero. An interesting innovation in this study involves examining the pathways through which financial inclusion variables Z_j might affect the choice of coping strategies that households adopt. To achieve this, we interact with each financial inclusion indicator – Z_i – separately, with dummy variables D_i for savings, credit and remittances. The corresponding model is re-specified in the following equation:

$$P(Y_j = 1|x_j) = \alpha_j + \beta_j X_{ij} + \gamma_j C_{ij} + \varphi_j Z_{ij} + \sum_{\forall j,i} \theta_{ij} Z_{ij} \times D_{ij} + \varepsilon_j. \quad (5)$$

If financial inclusion helps households to take advantage of savings, credit or receive remittances/transfers, whose availability and use influence the choice of coping strategy, then the coefficients θ_{ij} will be non-zero.

5. Econometric results

The main econometric results are provided in Table I. Findings in Model 1 indicate that household heads that have access to and use informal financial products are more likely to respond to shocks by selling assets than households who are excluded. In particular, households with access to informal finance are 10 percentage points more likely to sell assets in response to some shocks than the excluded households. This shows that informal finance only provides rather fragile coping alternatives, leading to distress asset sales that might compromise the long-term welfare positions of households.

The interactive terms of financial inclusion show that household heads who have access to informal financial institutions and are able to borrow are 8 percentage points less likely to sell assets. This is an interesting finding and indicates that households that are able to borrow due to access to financial services being less likely to run down their asset endowments. The implication is that such households can adopt a more sustained resilient path in periods that follow shocks, and is consistent with, among others, discussions in Heltberg *et al.* (2015), who similarly highlight the role of informal credit in helping households to manage risk by circumventing the choice of potentially “bad” coping strategies such as selling assets.

Other variables that are positively correlated with selling assets in response to some unanticipated shocks include: gender, wealth status and level of remoteness, as shown by distance to roads and residence in rural areas. On the contrary, the level of education is negatively associated with selling assets as a coping strategy. Specifically, having some secondary education reduces the likelihood of selling assets by 8 percentage points compared to households that have no education.

Results in Model (2) show that households that have both formal bank accounts and other accounts with informal institutions are more likely to borrow from formal institutions in response to some unanticipated shock than households that are excluded. The effect is larger for households that have informal accounts. The probabilities that a household will borrow from a formal institution in response to a shock are 8.2 and 24.6 percent points higher for households that have informal and formal accounts, respectively, than for households that are financially excluded. The coefficients on the interactive terms in Model (2) show that households that have access to informal financial institutions and have some level of savings are 13.5 percentage points more likely to borrow than households that are excluded and do not have savings. This result indicates that savings provide the transmission channel through which households are able to borrow in response to shocks.

Further, results show that education and employment status are correlated with the ability of the household to borrow. In particular, household heads that have some primary

Table I.
Main econometric
results

	(1) Sell assets	(2) Formal borrowing	(3) Informal borrowing	(4) Social networks	(5) Reduce consumption
Included – formal	0.053 (0.057)	0.059 (0.055)*	0.045 (0.057)	-0.015 (0.057)**	-0.043 (0.056)**
Included – informal	0.144 (0.046)***	0.140 (0.055)**	0.053 (0.047)**	-0.045 (0.047)**	-0.002 (0.045)*
Included – mobile money	-0.082 (0.075)	-0.024 (0.066)	0.019 (0.073)	-0.098 (0.081)	-0.044 (0.078)
Age of household head	0.002 (0.001)**	0.001 (0.001)	-0.001 (0.001)	-0.000 (0.001)	-0.001 (0.001)
Gender (cfr. Male = 1)	0.079 (0.030)***	-0.004 (0.025)	0.036 (0.032)	-0.028 (0.030)	-0.020 (0.029)
Wealth Quintile 2	0.057 (0.036)	0.041 (0.031)	0.014 (0.039)	-0.042 (0.037)	-0.006 (0.036)
Wealth Quintile 3	0.106 (0.036)***	0.040 (0.031)	-0.024 (0.041)	-0.011 (0.038)	-0.003 (0.037)
Wealth Quintile 4	0.079 (0.038)	0.042 (0.033)	0.006 (0.042)	-0.067 (0.040)*	-0.054 (0.039)
Wealth Quintile 5	0.061 (0.047)	0.041 (0.040)	0.051 (0.051)	-0.101 (0.050)**	-0.061 (0.047)
Some primary education	-0.015 (0.034)	0.051 (0.031)**	0.007 (0.038)	0.008 (0.037)	-0.009 (0.035)
Completed primary education	0.002 (0.039)	0.052 (0.035)	-0.007 (0.044)	-0.014 (0.043)	-0.004 (0.041)
Some secondary education	-0.079 (0.043)*	0.050 (0.036)	-0.020 (0.046)	0.055 (0.043)	-0.044 (0.044)
Self-employed	-0.009 (0.036)	0.094 (0.046)**	-0.022 (0.050)	0.041 (0.042)	0.056 (0.036)**
Paid employee	-0.086 (0.045)	0.079 (0.050)	0.023 (0.055)	0.041 (0.046)	0.052 (0.045)
Family worker	-0.085 (0.060)	0.298 (0.149)**	-0.083 (0.228)	0.131 (0.060)*	0.076 (0.059)
Rural (Cfr Urban)	0.085(0.032)***	0.049 (0.027)**	-0.017 (0.034)	-0.023 (0.032)	-0.005 (0.002)*
Distance to roads	0.005(0.002)***	-0.006 (0.002)**	0.001 (0.002)	-0.001 (0.002)	-0.049 (0.031)
Formal × transfer	-0.044 (0.055)	0.059 (0.051)	-0.073 (0.059)	-0.019 (0.056)	0.008 (0.054)
Formal × savings	-0.034 (0.055)	0.002 (0.056)	-0.061 (0.059)	-0.059 (0.055)	-0.097 (0.054)**
Formal × credit	0.023 (0.053)	-0.051 (0.042)	0.117 (0.045)***	-0.026 (0.055)	0.053 (0.054)
Informal × transfer	-0.016 (0.043)	0.135 (0.042)***	-0.056 (0.044)	0.046 (0.042)	0.027 (0.041)
Informal × savings	0.016 (0.040)			0.016 (0.041)	0.021 (0.039)
Informal × credit	-0.078 (0.039)**			-0.030 (0.040)	0.007 (0.039)
Mobile money × transfer	0.061 (0.063)	0.015 (0.051)	0.021 (0.068)	0.149 (0.073)**	-0.037 (0.067)
Mobile money × savings	0.067 (0.065)	0.007 (0.062)	0.010 (0.067)	-0.058 (0.066)	0.104 (0.065)
Mobile money × credit	-0.001 (0.057)			0.026 (0.062)	-0.074 (0.059)
Regional fixed effects	Yes	Yes	Yes	Yes	Yes
Number of observations	1,372	1,367	1,367	1,372	1,372
Pseudo R ²	0.092	0.155	0.040	0.073	0.071
LR χ ²	139.59 (0.000)***	190.81 (0.000)***	67.02 (0.000)***	118.63 (0.000)***	110.66 (0.000)

Notes: The coefficients are tabulated; standard errors are in parentheses. *, **, ***Significant at the 10, 5 and 1 percent levels, respectively

education are on average 2 percentage points more likely to borrow than those without an education, and those who are self-employed or engage in paid family work are, respectively, 9 and 22 percentage points more likely to borrow than households that are unemployed. Surprisingly, results show that households in the rural areas are 5 percentage points more likely to borrow from formal sources than households in the urban areas. This result is counter intuitive and deserves further investigation beyond the current analysis. First, there tend to be fewer access points for formal financial services in rural areas; and, second, rural households tend to be poorer and therefore less likely to participate in the formal credit markets. However, households that are located further away from a major all-weather road are less likely to borrow in response to some unanticipated shock.

Results in Model (3) show that households that have access to informal finance are likely to borrow from informal institutions in response to some unanticipated shock than households that are excluded. The likelihood that a household will borrow from an informal institution in response to a shock is 4.7 percent points higher for households that have accounts with informal institutions. The interactive terms show that the effect of informal finance on borrowing is transmitted through transfers. In particular, households that use informal financial services and received a transfer are 12 percentage points more likely to have borrowed from an informal institution. This finding shows the importance of informal institutions for risk sharing and corroborates earlier work by Fafchamps and Lund (2003), who find that shocks have strong effects on informal credit in the rural districts of the Philippines. In addition, this finding relates to the work of Alvi and Dendir (2009), who similarly show that transfers enable informal loans to facilitate risk sharing among Ethiopian urban poor households.

Results in Model (4) show that households that have access to both formal and informal finance are less likely to rely on informal social networks of friends and family in response to some unanticipated shock than households that are excluded. Specifically, households with formal bank and informal accounts are, respectively, 5.3 and 5 percentage points less likely to rely on social networks as coping strategies. The interaction term between mobile money and transfers is positive and significantly different from zero. This confirms that mobile money transfers support risk sharing social networks. This finding is consistent with recent work by Riley (2018), who similarly documents the risk sharing effects of mobile money in developing country contexts.

Further, results show that wealthier households are less likely to rely on social networks. Specifically, households in the fourth and fifth wealth quintiles are, respectively, 7.4 and 8.7 percentage points less likely to turn to social networks as a coping mechanism. Another important correlate of social networks is employment status. Household heads who engage in paid family employment are 11.8 percentage points more likely to rely on social networks than households for whom the head is unemployed. This could be because employment increases a household's social capital that enables transfers that are based on trust and friendship.

Results in Model (5) indicate that financial inclusion reduces the likelihood that a household will reduce consumption in response to some adverse shocks. Specifically, households that have a formal bank account are 6.5 percentage points less likely to reduce consumption when compared to households that are financially excluded. The effect of formal inclusion on consumption is transmitted through the effect of savings. The interaction term between savings and formal finance is negative and statistically significant, showing that households that have an account with a formal institution and are able to save are less likely to reduce consumption. This result shows that financial inclusion helps households to smooth consumption through its effect on savings, and is consistent with empirical investigations by, among others, Lensink *et al.* (2017), who also show that access to savings helps households to smooth consumption in the face of adverse shocks.

With regard to the effect of household characteristics, results indicate that only employment matters for reducing consumption. Specifically, household heads that are self-employed are more 6.1 percentage points more likely to reduce consumption as a coping strategy than households that are unemployed. In addition, households that are far away from an all-weather road and are rural are less likely to reduce consumption when compared to households that are near and less remote. For every additional kilometer from a major road, households are 0.05 percentage points less likely to reduce consumption as a coping strategy.

Robustness tests

Earlier research has established that income is an important determinant of financial inclusion in Africa (see e.g. Zins and Weill, 2016). In addition, research has shown that financial inclusion is hindered by remoteness and proximity to basic infrastructure (Allen *et al.*, 2016). As robustness checks, therefore, we sought to confirm that the effects of financial inclusion on choice of coping strategy, and the established pathways of credit, transfers and savings, are not driven by wealth status and geographical location. We accordingly proceeded to discard, separately, households that belong to the highest wealth quintile – i.e. the top 20 percent – and those that reside in urban areas. Findings from robustness tests are provided in Tables AI and AII, and show that results are robust to the exclusion of wealthy and urban households.

6. Conclusions and policy implications

Many people in developing countries have to deal with increasing shocks of varying types, frequencies and magnitudes. Many such shocks expose households to various vulnerabilities and poverty. Still, for many households, the lack of quality insurance mechanisms and imperfect financial markets limit the scope of coping strategies with debilitating implications for long-term welfare and vulnerability.

This paper, while focusing on Uganda, sought to understand whether access to financial instruments is important for the choice of coping strategies that households adopt. Results indicated that the access to financial inclusion is associated with the choice of coping strategies that households adopt. In particular, financial inclusion increases the likelihood that households will adopt market-oriented strategies such as selling assets and borrowing of any type (formal or informal) and reduce the likelihood that a household will rely on non-market strategies, such as reliance on informal networks of kinship and friends and reducing consumption. These results are mediated by the differentiated effects of credit, savings and transfers that are made possible by financial inclusion.

Results further reveal that informal finance is of greater importance to households in mediating the choice of coping strategies. This might be due to the limited penetration of formal financial services. These results suggest that financial inclusion efforts should be integrated into the wider safety net programs aimed at improving resilience and cushioning households against the adverse effects of shocks.

References

- Allen, F., Carletti, R. and Cull, R. (2014), “The African financial development and financial inclusion gaps”, *Journal of African Economies*, Vol. 23 No. 5, pp. 614-642.
- Allen, F., Demirgüç-Kunt, A., Klapper, L. and Peria, M.S.M. (2016), “The foundations of financial inclusion: understanding ownership and use of formal accounts”, *Journal of Financial Intermediation*, Vol. 27, pp. 1-30.
- Alvi, E. and Dendir, S. (2009), “Private transfers, informal loans and risk sharing among poor urban households in Ethiopia”, *Journal of Development Studies*, Vol. 45 No. 8, pp. 1325-1343.

- Barrett, C.B., Reardon, T. and Webb, P. (2001), "Nonfarm income diversification and household livelihood strategies in rural Africa: concepts, dynamics, and policy implications", *Food Policy*, Vol. 26 No. 4, pp. 315-331.
- Beegle, K., Dehejia, R.H. and Gatti, R. (2006), "Child labour and agricultural shocks", *Journal of Development Economics*, Vol. 81 No. 1, pp. 80-96.
- Bloch, F., Genicot, G. and Ray, D. (2008), "Informal Insurance in social networks", *Journal of Economic Theory*, Vol. 143 No. 1, pp. 36-58.
- Börner, J., Shively, G., Wunder, S. and Wyman, M. (2015), "How do rural households cope with economic shocks? Insights from global data using hierarchical analysis", *Journal of Agricultural Economics*, Vol. 66 No. 2, pp. 392-414.
- Carlson, S., Dabla-Norris, E., Saito, M. and Velloso, R. (2015), "Household financial access and risk sharing in Nigeria", IMF Working Paper No. WP/15/169, International Monetary Fund, Washington, DC.
- Demirgüç-Kunt, A., Klapper, L., Dorothe, S. and Van Oudheusden, P. (2014), "The global finindex database 2014: measuring financial inclusion around the world", Policy Research Working Paper No. 7255, The World Bank, Washington, DC.
- Dercon, S. (1996), "Risk, crop choice, and savings: evidence from Tanzania", *Economic Development and Cultural Change*, Vol. 44 No. 3, pp. 485-513.
- Dercon, S., Hoddinott, J. and Woldehanna, T. (2005), "Shocks and consumption in 15 Ethiopian villages, 1999-2004", *Journal of African Economies*, Vol. 14 No. 4, pp. 559-585.
- Fafchamps, M. and Gubert, F. (2007), "The formation of risk sharing networks", *Journal of Development Economics*, Vol. 83 No. 2, pp. 326-350.
- Fafchamps, M. and Lund, S. (2003), "Risk-sharing networks in rural Philippines", *Journal of Development Economics*, Vol. 71, pp. 261-287.
- Heltberg, R., Oviedo, A.M. and Talukdar, F. (2015), "What do household surveys really tell us about risk, shocks, and risk management in the developing world?", *The Journal of Development Studies*, Vol. 51 No. 3, pp. 209-225.
- Hoddinott, J. (2006), "Shocks and their consequences across and within households in rural Zimbabwe", *The Journal of Development Studies*, Vol. 42 No. 2, pp. 301-321.
- Jack, W. and Suri, T. (2014), "Risk sharing and transaction costs: evidence from Kenya's mobile money revolution", *The American Economic Review*, Vol. 104 No. 41, pp. 183-223.
- Jack, W., Ray, A. and Suri, T. (2013), "Transaction networks: evidence from mobile money in Kenya", *The American Economic Review*, Vol. 103 No. 6, pp. 356-361.
- Lensink, R., Servin, R. and Berg, M. (2017), "Do savings and credit institutions reduce vulnerability? New evidence from Mexico", *Review of Income and Wealth*, Vol. 63 No. 2, pp. 335-352.
- Maweje, J. and Holden, S.T. (2014), "Social capital, shocks and livestock investments: evidence from Masaka district, Uganda", *International Journal of Development Issues*, Vol. 13 No. 2, pp. 98-112.
- Maweje, J. and Sebudde, R.K. (forthcoming), "Constraints or complaints? Business climate and firm performance perceptions in Uganda", *Journal of Developing Studies*, available at: <https://doi.org/10.1080/00220388.2018.1502878>
- Modena, F. and Gilbert, C.L. (2012), "Household responses to economic and demographic shocks: marginal logit analysis using Indonesian data", *Journal of Development Studies*, Vol. 48 No. 9, pp. 1306-1322.
- Riley, E. (2018), "Mobile money and risk sharing against village shocks", *Journal of Development Economics*, Vol. 135, pp. 43-58.
- Rosenzweig, M.R. and Wolpin, K.I. (1993), "Credit market constraints, consumption smoothing, and the accumulation of durable production assets in low-income countries: investments in bullocks in India", *Journal of Political Economy*, Vol. 101 No. 2, pp. 223-244.

Urrea, M.A. and Maldonado, J.H. (2011), "Vulnerability and risk management: the importance of financial inclusion for beneficiaries of conditional transfers in Colombia", *Canadian Journal of Development Studies*, Vol. 32 No. 4, pp. 381-398.

World Bank (2014), "Risk and opportunity: managing risk for development", World Development Report, World Bank, Washington, DC.

Yilma, Z., Mebratie, A., Sparrow, R., Abebaw, D., Dekker, M., Alemu, G. and Bedi, A.S. (2014), "Coping with shocks in rural Ethiopia", *Journal of Development Studies*, Vol. 50 No. 7, pp. 1009-1024.

Zins, A. and Weill, L. (2016), "The determinants of financial inclusion in Africa", *Review of Development Finance*, Vol. 6 No. 1, pp. 46-57.

Corresponding author

Joseph Maweje can be contacted at: jmaweje@gmail.com

	(1) Sell assets	(2) Borrow – formal	(3) Borrow – informal	(4) Social networks	(5) Reduce consumption
Included – formal	0.103 (0.062)*	0.022 (0.065)	0.041 (0.061)	-0.027 (0.063)	0.004 (0.061)
Included – informal	0.153 (0.051)***	0.151 (0.062)***	0.075 (0.051)	-0.053 (0.050)	0.018 (0.048)
Included – mobile money	-0.199 (0.087)**	0.034 (0.077)	0.035 (0.082)	-0.075 (0.095)	-0.077 (0.087)
Age of household head	0.002 (0.001)*	0.000 (0.001)	-0.001 (0.001)	0.000 (0.001)	-0.001 (0.001)
Gender (cfr. Male = 1)	0.091 (0.034)***	-0.025 (0.027)	0.014 (0.035)	-0.016 (0.034)	-0.013 (0.032)
Wealth Quintile 2	0.067 (0.037)**	0.039 (0.032)	0.012 (0.039)	-0.054 (0.037)	0.017 (0.036)
Wealth Quintile 3	0.105 (0.037)***	0.038 (0.033)	-0.017 (0.040)	-0.015 (0.039)	0.010 (0.036)
Wealth Quintile 4	0.080 (0.041)**	0.039 (0.035)	0.017 (0.042)	-0.078 (0.041)**	-0.039 (0.039)
Some primary education	-0.014 (0.041)	0.074 (0.038)*	0.024 (0.044)	-0.000 (0.043)	0.010 (0.041)
Completed primary education	-0.019 (0.045)	0.082 (0.042)*	0.015 (0.050)	-0.020 (0.049)	-0.008 (0.046)
Some secondary education	-0.101 (0.052)*	0.084 (0.045)*	0.002 (0.055)	0.050 (0.052)	-0.059 (0.052)
Self-employed	0.005 (0.042)	0.096 (0.052)*	-0.029 (0.053)	0.027 (0.042)	0.094 (0.042)**
Paid employee	-0.019 (0.053)	0.083 (0.058)	-0.015 (0.061)	0.063 (0.054)	0.101 (0.054)*
Family worker	-0.052 (0.068)	0.424 (0.198)**	-0.047 (0.225)	0.145 (0.066)**	0.133 (0.065)**
Distance to roads	0.008 (0.002)***	-0.008 (0.003)***	-0.000 (0.003)	-0.001 (0.003)	-0.003 (0.003)
Rural (Cfr Urban)	0.119 (0.039)***	0.023 (0.032)	-0.052 (0.039)	0.010 (0.037)	-0.058 (0.035)*
Formal × transfer	-0.0154 (0.061)	0.087 (0.056)	-0.109 (0.064)*	0.018 (0.062)	-0.022 (0.059)
Formal × savings	-0.052 (0.062)	0.068 (0.065)	-0.046 (0.064)	-0.071 (0.061)	-0.122 (0.059)**
Formal × credit	-0.039 (0.059)			0.011 (0.06)	0.001 (0.057)
Informal × transfer	-0.045 (0.047)	-0.058 (0.045)	0.124 (0.048)***	0.006 (0.046)	0.030 (0.044)
Informal × savings	0.012 (0.045)	0.126 (0.045)***	-0.089 (0.047)*	0.026 (0.044)	0.004 (0.042)
Informal × credit	-0.083 (0.043)*			-0.027 (0.043)	0.026 (0.041)
Mobile money × transfer	0.072 (0.071)	-0.006 (0.057)	-0.015 (0.075)	0.153 (0.083)	0.042 (0.074)
Mobile money × savings	0.104 (0.078)	-0.043 (0.075)	0.045 (0.078)	-0.060 (0.078)	0.087 (0.074)
Mobile money × credit	0.109 (0.069)			-0.045 (0.073)	-0.073 (0.069)
Economic shock	0.123 (0.025)***	0.018 (0.022)	0.054 (0.026)**	0.054 (0.026)**	0.160 (0.024)***
Natural shock	0.013 (0.026)	-0.018 (0.022)	0.0314 (0.028)	-0.070 (0.026)***	0.083 (0.024)***
Health shock	0.015 (0.031)	-0.009 (0.026)	0.191 (0.035)***	0.142 (0.033)***	-0.082 (0.028)***
Regional fixed effects	Yes	Yes	Yes	Yes	Yes
Number of observations	1,115	1,110	1,107	1,115	1,115

Notes: The coefficients are tabulated; standard errors are in parentheses. *, **, ***Significant at the 10, 5 and 1 percent levels, respectively

Table A1. Robustness tests – wealth status

Table AII.
Robustness tests –
rural households

	(1) Sell assets	(2) Borrow – formal	(3) Borrow – Informal	(4) Social networks	(5) Reduce consumption
Included – formal	0.042 (0.070)	0.066 (0.065)	0.048 (0.066)	-0.011 (0.067)	-0.046 (0.066)
Included – informal	0.137 (0.056)**	0.205 (0.072)***	0.073 (0.054)*	-0.094 (0.052)*	0.011 (0.050)
Included – mobile money	-0.150 (0.099)	-0.075 (0.087)	0.053 (0.089)	-0.112 (0.100)	0.032 (0.093)
Age of household head	0.002 (0.001)*	0.000 (0.001)	-0.000 (0.0001)	0.000 (0.002)	-0.000 (0.001)
Gender (cfr. Male = 1)	0.073 (0.037)**	-0.012 (0.0308)	0.035 (0.038)	-0.030 (0.035)	-0.016 (0.034)
Wealth Quintile 2	0.060 (0.038)	0.037 (0.035)	-0.013 (0.042)	-0.049 (0.039)	-0.000 (0.037)
Wealth Quintile 3	0.115 (0.037)***	0.030 (0.035)	-0.025 (0.043)	-0.042 (0.040)	0.003 (0.038)
Wealth Quintile 4	0.084 (0.040)	0.043 (0.038)	0.014 (0.045)	-0.082 (0.043)*	-0.057 (0.042)
Wealth Quintile 5	0.021 (0.062)	0.081 (0.049)*	0.073 (0.061)	-0.156 (0.063)**	-0.041 (0.058)
Some primary education	-0.022 (0.044)	0.060 (0.039)	-0.025 (0.046)	0.010 (0.045)	-0.027 (0.042)
Completed primary education	0.002 (0.049)	0.065 (0.044)	-0.025 (0.053)	-0.007 (0.052)	-0.020 (0.049)
Some secondary education	-0.089 (0.054)*	0.076 (0.045)*	-0.017 (0.056)	0.057 (0.053)	-0.109 (0.054)
Self-employed	-0.026 (0.044)	0.139 (0.057)**	-0.070 (0.056)	0.021 (0.044)	0.077 (0.044)*
Paid employee	-0.075 (0.056)	0.113 (0.062)*	-0.044 (0.063)	0.102 (0.056)*	0.066 (0.056)
Family worker	-0.058 (0.071)	0.415 (2.232)*	-0.083 (0.228)	0.147 (0.067)**	0.125 (0.066)*
Distance to roads	0.007 (0.002)***	-0.006 (0.003)	0.000 (0.003)	-0.002 (0.003)	-0.004 (0.003)
Formal × transfer	-0.007 (0.066)	0.082 (0.059)	-0.068 (0.068)	-0.028 (0.063)	-0.074 (0.062)
Formal × savings	-0.025 (0.067)	-0.008 (0.066)	-0.084 (0.069)	-0.066 (0.064)	-0.099 (0.063)
Formal × credit	0.005 (0.064)			0.011 (0.062)	0.125 (0.060)**
Informal × transfer	-0.033 (0.050)	-0.066 (0.048)	0.069 (0.051)**	0.037 (0.047)	0.061 (0.045)
Informal × savings	0.038 (0.047)	0.134 (0.048)***	-0.075 (0.049)	0.058 (0.043)	0.035 (0.043)
Informal × credit	-0.088 (0.046)			-0.037 (0.044)	-0.006 (0.042)
Mobile money × transfer	0.093 (0.079)	-0.010 (0.061)	-0.036 (0.086)	0.207 (0.089)**	-0.002 (0.078)
Mobile money × savings	0.094 (0.087)	0.096 (0.086)	0.037 (0.085)	-0.123 (0.083)	0.018 (0.081)
Mobile money × credit	0.053 (0.074)			0.046 (0.077)	-0.145 (0.073)**
Regional fixed effects	Yes	Yes	Yes	Yes	Yes
Number of observations	1,032	1,028	1,026	1,032	1,032

Notes: The coefficients are tabulated; standard errors are in parentheses. *, **, ***, Significant at the 10, 5 and 1 percent levels, respectively