# Institutional Moral Hazard and Inclusive Finance: When Good is Not so Good

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**Abstract:** Moral hazard in financial institutions holds when either the institution or the client does not guard against risks either to themselves or for the other party mainly because they are protected from the consequences of such risk. Inclusive financialinstitutions that serve the poor are have cut a "polite and respectable image"and have therefore become the buzz word in development finance. There is therefore a dearth of information on inclusive lending methodologies like solidarity lending and their long terms effects on household welfare. It is within this background that this study was carried out. The study is motivated by a genre of empirical studies that have suggested the possibility of fuelling vulnerability to poverty among households by microfinance programs (Hulme and Mosley 1996, Morduch 2000, Kiiru 2007). The main objective of this paper is to articulate an alternative thesis that "informal collateral in the form of joint liability lending as currently implemented over-secures loans by poor borrowers thus exposing them further vulnerability to poverty". We further argue that "over-insurance" of loans by poor borrowers is a main contributor to moral hazard by microfinance institutions. We intend to pursue this thesis theoretically and also empirically. The study therefore combines both parametric and non-parametric methods to document and track the process of access to credit by rural poor households, utilization of such credit across household expenditures both productive and nonproductive, repayment and the resulting welfare outcomes. The study demonstrates that without proper regulation and adherence to regulations, inclusive financialinstitutions could indeed result to moral hazard.Moral hazard by financial institutions has adverse effects on household welfare.

**Keywords:** microfinance institutions, Moral hazard, poor households, vulnerability to poverty

## Introduction and Research Problem

Access to capital is crucial for all entrepreneurs'regardless of their genre. Entrepreneurial activity is akin to a production process with capital being a key input without which the production process is paralyzed. Market imperfections exist especially in developing countries and this implies that access to credit is problematic especially to poorerentrepreneurs who may lack formal collateral. Yet income diversificationthrough off farm activities for rural households in sub-Saharan Africa is crucial for improving household incomes and welfare. The number of poor entrepreneurs in Sub-Saharan Africa that require financial services in small amounts is enormous and overwhelming especially in a context of constrained lending institutions. Further, the credit market for the poor is prone to the usual problems of adverse selection, moral hazard and lack of insurance. *Ceteris paribus*, the costs of lending to the poor are much higher than lending to the better off who normally access credit through formal commercial banks. Little wonder that microcredit interest rates arehigher than commercial bank interest rates. Can the poor really afford such high rate of interest? Economic theory is positive that poor entrepreneurs with lower capitalization are better positioned to pay higher rates of interest compared to highly capitalized enterprises (supposedly by the richer entrepreneur). Theoretically, the strict concavity of the production function predicts diminishing marginal returns to capital. The more the capitalization for an enterprise, the lower the marginal returns to capital. Figure 1 illustrates the point.

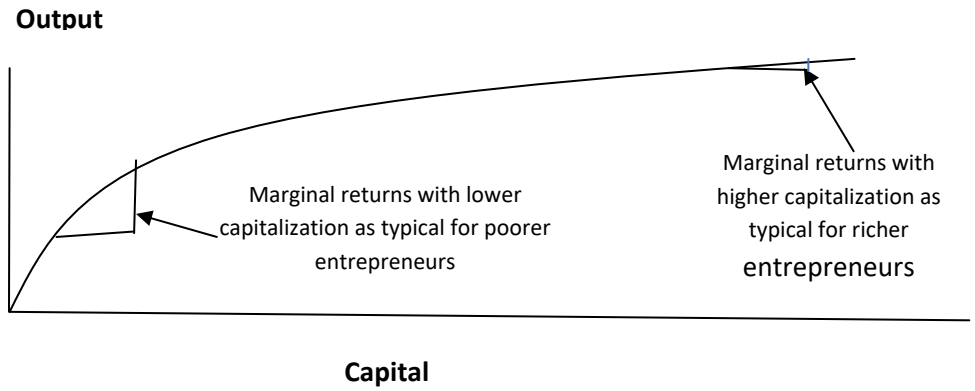


**Figure 1: Compared to richer entrepreneurs, Poorer entrepreneurs expect higher marginal returns to capital and are willing to pay more for capital. Adapted from De Aghion and Morduch (2005)**

The forgoing figure demonstrates that, the poor are not only able but are also willing to pay more for capital. For example, besides family and friends, formal microfinance institutions offer lower interest rates compared to other credit sources available to the poor (Kiiru 2007, Roodman and Quresh 2006). These sources include the shylock and other informal money lenders, who easily rent at interest rates of more than 100% per annum. Research has therefore moved on from the ability of the poor entrepreneur to repay higher rates of interest to the realm of the socio economic implications of the transactions.If the poor are able and willing to pay higher rates of interest, why is it that financial institutions don't compete to lend to them? Why is it that before microfinance became a reality the poor had been sidelined by formal financial institutions? The answer to this question relates to risk and transaction costs. Disbursing many small loans over some relatively wide geographical location with no formal addressesincreases the costs of administration. High transaction and administrative costs are further complicated by information asymmetry. Poor clients also lack collateral. Given these challenges, Roodman and Qureshi (2006) observe that "the genius of microfinance is the ability to find a suite of techniques that solve the complex business problems of building loan volumes, maintaining high repayment, retaining customers and minimizing the scope for fraud while dealing with very poor borrowers". Joint liability lending also known as solidarity group lending is celebrated as an innovation genius that enables the poor to secure their loans using social collateral in the absence of the traditional formal collateral (Simtowe and Zeller 2006).Joint liability lending has demonstrated to the world that it is possible to lend to the poor not just out of charity but as"good" business. Microfinance is hailed as a win-win solution to alleviating poverty in that whereas the poor supposedly benefit from credit, microfinance institutions are indeed in business. Whereas the win-win story of microfinance is more familiar, we choose to digress at this point to bring in a different twist to the story in order to cut out our research problem. Our objective which is at the center of our research problem is to articulate an alternative perspective with the thesis that "informal collateral in the form of joint liability lending as currently implemented over-secures loans to the effect that poor borrowers are exposed to further vulnerability to poverty". Over-insurance of loans is the genesis of moral hazard by microfinance institutions. We intend to pursue this thesis theoretically and also empirically.

**Research objectives**

The main objective of this paper is therefore twofold:

1) To present an economic theory of vulnerability to poverty in relation to poor microfinance borrowers.
2) To empirically investigate if participation in microfinance programs significantly exposes poor household to further vulnerability to poverty.

The rest of this paper is organised as follows; Section 2 discusses the strength and serenity of joint liability lending as informal social collateral.Section three is a detailed exposition of the theoretical framework of vulnerability, section four is the methodology section. Section five presents our results while section six concludes the paper and presents our policy recommendations.

## 1. Joint liability lending as social collateral

Microfinance relies on social networks and social ties to lower the transactions cost of dealing with very many borrowers all needing small loans. "Group lending with joint liability is seen as an effective instrument to

circumvent information asymmetries, because it incentivizes group members to use their social ties to screen, monitor, and enforce loan repayment on their peers (Postelnicu et al 2013)". The resources embedded in such social network/ social ties are both pecuniary and non-pecuniary. The non-pecuniary resources are mainly soft infrastructures that increase individual returns from social capital including information sharing and deterrent to moral hazard behavior among group members. Literature assumes that it is the social ties embedded in social capital that incentivize group members to co-ordinate their repayment decisions and control delinquency. Social capital also evokes reciprocity and solidarity within a social network or community. Reciprocity and solidarity is critical for resource poor communities that also have to deal with idiosyncratic shocks. Social capital and social networks therefore provide informal social insurance that mitigateidiosyncratic shocks.

Theoretically, "network connections (and social ties) between individuals can be used as social collateral to secure informal borrowing" Dean et al et al 2009. Social ties in the case of joint liability lending go beyond internal ties between group membersto include external ties linking borrowers to non-borrowers within a community (Postelnicu et al 2013). These ties hold the key to understanding how group lending works to screen potential borrowers, monitorentrepreneurial activity by actual borrowers and enforce both formal and informal contracts in the borrowing framework. The social capital pledged by borrowersconsist of both resources embedded in their internal (with fellow group members) and external ties (other established social ties outside the borrowing framework). The risk of compromising a member's external and internal ties is assumed to be a deterrent to moral hazard behavior. Failure to repay a loan when due may compromise such ties and result to loss of reputation among other social sanctions.
The microfinanceinstitution not only has the serenity of social networks to rely on, but further imposes monetary deterrent to delinquency. For example, the first loan installment together with expected interest is subtracted from the funds disbursable to the joint liability borrower. In other word, loans for the poor are technically due with interest on the day they are advanced. Weekly and or monthly group meetings to address repayments are demanded and presided over by loan officers. Our theoreticalframework will further illustrate that "severe" loan repayment enforcementsincreasethe exposure tovulnerability to poverty.

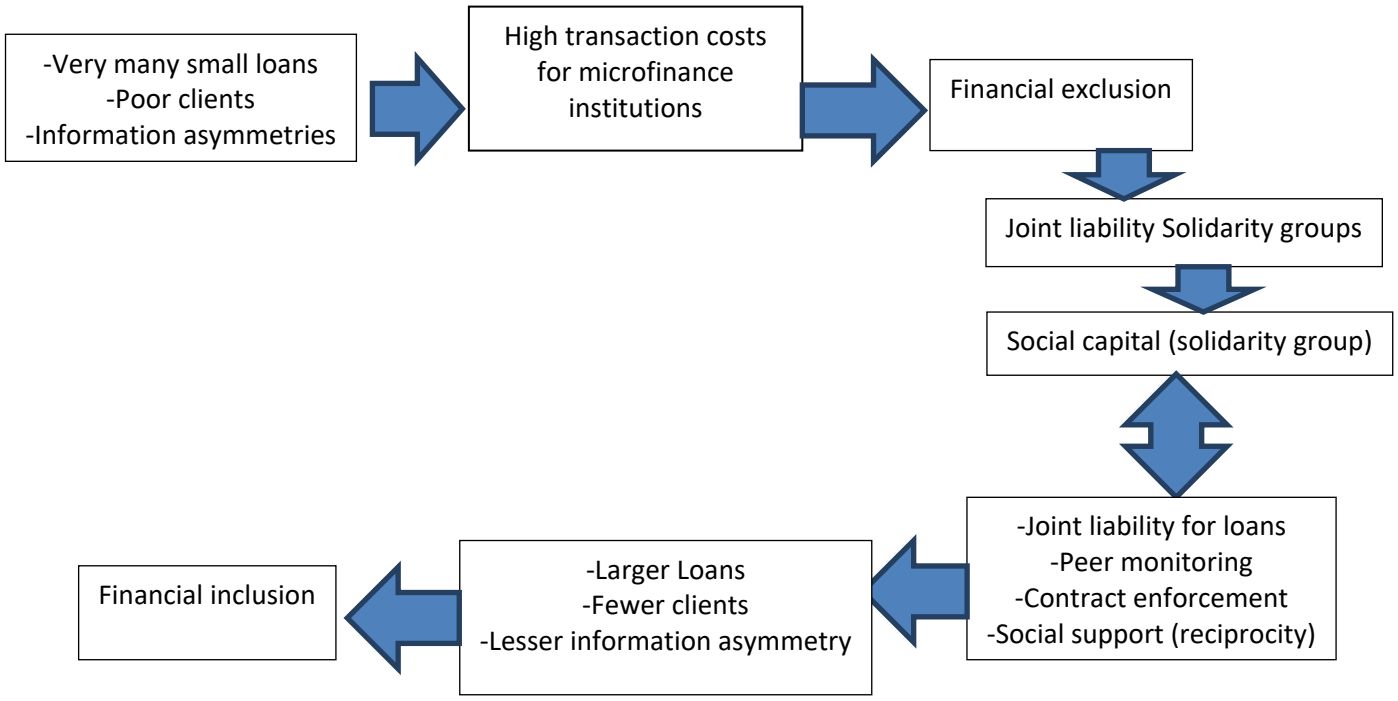


**Figure 2: Joint liability solidarity groups as key to financial inclusion of the poor**

Providing small loans to very many poor borrowers without collateral is only made practical by squeezing the operating costs as well as shifting certain classical banking tasks (costs) to clients. This helps the microfinance institution to lower transaction costs and translate the small individual loans sizes into larger ones through group lending. Loans to groups as opposed to individuals are cheaper for the MFI to administer, and more convenient for

the individual client who has no collateral to borrow individually. The costs of monitoring of loan use and repayment are usually shifted to borrowers.

## 2. Theoretical Framework: Vulnerability to poverty for poor microfinance customers

There are two main theoretical strands that explain vulnerability to poverty. The first strand explains vulnerability to poverty as low expected utility while the second strand explains vulnerability to poverty as expected poverty. Households are vulnerable to shocksthat affect their vulnerability to poverty. Even before shocks materialize, the threat of such shocks shape household behavior. When households expect a shock they adapt their households spending to mitigate such shocks. Poor households are likely to under invest in the current period as a way of mitigating future shocks. Calvo 2016 argues that "vulnerability prompts households to mitigate their exposure to future poverty, paradoxically at the cost of sacrificing their chances to improve their overall expectations for the future".

To formalize these ideas, we adapt the model as developed by Calvo 2016. Let $x_t$ be some welfare outcome at time t for both microfinance participants and non-participants. $x_t$ also determines household utility at that point in time $u_t$. That is, $u_t=U(x_t)$. Where in this case and for the rest of this paper whenever a capital letter is used it signals a function. Let z be the relative poverty line as later developed in this paper. In this case a household is poor if $x_t$is less than z ($x_t< z$). We define $x_t$as consumption; that is also a proxy for household welfare. We further assume that at time t the household is uncertain about t+1. Assume also the possibility of a random shock that may hit at t+1 with implications on $x_t$+1. With information at time t, let $E_t$be the expected value operator. In this case Et $[x_{t+1}]$ is the expected consumption at time t in the next period. Assuming a finite number of the possible consumption outcomes (m), then vectors $X_{t+1}$, $u_{t+1}$ and P are values for consumption, utility and probabilities for those m states. Hence $E_t[x_{t+1}]= P'X_{t+1}$,$E_t[u_{t+1}]= P'u_{t+1}$ and therefore vulnerability at time t is defined as follows:

$V_t=V(z,x_t,p,X_{t+1})$…….1,

with the assumption that V is differentiable. Though trivial, vulnerability cannot decrease at any instance where $x_{t+1}$ s, decreases in any s-th situation. Hence V should be monotonic:

$$\frac{\Delta V(z, x_t, P, X_{t+1})}{\Delta x_{t+1}, s} \leq 0 \text{ ……..2}$$

With respect to policy, we look at three decisive arguments of V. The first argument is derived from reference dependence, which holds that the current consumption $x_t$should matter, given that a lower future consumption will lessen household welfare.

$$\frac{\Delta V(z, x_t, P, X_{t=1})}{\Delta x_t} > 0 \text{ ……..3}$$

The second argument is derived from risk sensitivity, given that household welfare will be negatively affected if the household is uncertain about their future.

$$V(z, x_t, P, X_{t+1}) > V(z, x_t, P, E_t[x_{t+1}]1) \text{ ……4}$$

Where 1 is a vector whose elements are all one. In this case vulnerability would be lower incases where expected consumption levels were attained with certainty.

The third argument is derived from mitigation policy. Deliberate mitigation through policy would ensure that situations where $x_{t+1}, s > z$ are not policy issues. This is particularly important in our study as we seek to analyse the contexts that may expose poor borrowers to further poverty:

$$\frac{\Delta V(z, x_t, P, X_{t+1})}{\Delta x_{t+1}, s} = 0 \text{ if } x_{t+1}, s > z \text{ ……..5}$$

### 3.1 How does vulnerability affect household choices?

Utility maximising households will minimize their vulnerability to possible shocks. What this means for poor borrowers is that investments in high return enterprises would also imply higher risks, including a longer waiting period for such returns hence the threat of missing out on a monthly repayment. Missing a monthly repayment is not an option for poor borrowers in microfinance institutions. The socio (including antagonized social networks) and economic (including financial costs) are so high that a single household cannot afford to default on a loan. Poor borrowers may thus risk being held in a poverty trap, as they increase their efforts to reduce their vulnerability. The link between minimization of household vulnerability and poverty trap was has been identified in literature. Morduch 1994 as quoted in Calvo2016, elaborates the link between vulnerability and poverty and argues that "greater wealth implies greater willingness to undertake entrepreneurial risks, provided risk aversion decreases in wealth" (p. 6). Risk-averse preferences by poor households would also imply precautionary saving motives. Poor microfinance borrowers remit monthly contributions to the microfinance institutions. These deposits are also security for loans advanced to the group, and are only available to households if all loans advanced to the group have been redeemed. In Fafchamps and Pender as quoted in Calvo 2016 "Risk-averse preferences exhibit precautionary savings motives. Households will need to pile up savings beyond the cost of the investment….cautious households will never entirely sacrifice readily available resources" (P.6). Fafchamps-Pender argument is very consistent with the behaviour exhibited by poor microfinance borrowers. Microfinanceinstitutions offer readily available resources to poor borrowers, in return households are cautious to preserve their eligibility to future credit. Calvo 2016 observes "Vulnerability thus implies a higher savings threshold and a greaterdifficulty to escape poverty" (P. 6). Should poor households' debt burden threaten their eligibility in to future credit programs, they diversify their credit sources and acquire more loans to repay other loans. Eswaran and Kotwal (1989) articulate this argument in the mainstream literature; They argue that Poor risk-averse households opt for credit as a safety net, however, should they be excluded from borrowing institutions, they will still reduce their exposure to risk and will not invest or will at most under invest even if the expected returns are high. The argument here is that as poor households work to reduce vulnerability and in the absence of insurance, their efforts will reduce future expected earnings. We again formalise these ideas:

Let $w_{t+1}$ denote income, with an expected random shock $\in_{t+1}$.

Then, $w_{t+1}, s = u_{t+1} + \in_{t+1}, s$ ……..6

Where s denotes a certain context and $u_{t+1}$ is a non random value. The next step is to assume that the household would love to insure their current consumption from income shocks. $b_{t+1}$, s is the insurance premium. Hence

$b_{t+1}, s = -\lambda \in_{t+1}, s$, with $0 \le \lambda \le 1$ ……..7

$\lambda = 1$ implies that insurance is complete and household has secured $w_{t+1}, s = u_{t+1}$. In this case, the household consumption function becomes:

$x_{t+1}, s = X(u_{t+1} + (1-\lambda) \in_{t+1}, s)$ ……..8

Let transfers to the household be constant and assume that consumption is a function of all available income:

$x_{t+1}, s = u_{t+1} + (1-\lambda) \in_{t+1}, s$ ……..9

Ligon and Schechter (2003) argue that vulnerability to poverty is a shortfall in the ex-ante expected utility for a risk averse household in relation to the household utility with a secure poverty line x. Hence according to Ligon and Schechter 2003:

$V = U(z) - E_t\left[u(x_{t+1})\right]$ with U′ > 0 and U′′< 0 ……10

Where V in this case denotes vulnerability.

The argument by Ligon and Schechter is very concrete. Feeding equation 9 in to a second order Taylor approximation of eqution 10:

$$vt = U(z) - U(ut+1) - \frac{u''(ut+1)}{2}(1-\lambda)^2 \delta^2{}_{t+1} \ldots\ldots\ldots\ldots\ldots\ldots 11$$

In equation 11, as households aim to reduce their vulnerability at time t they may forgo opportunities to raise their expected income $u_{t+1}$ with a significantly higher exposure to un-insured risk $(1-\lambda)^2 \delta 2_{t+1}$. Hence risk-averse poor microfinance borrowers may try to protect the credit resource, the fear of losing the credit facility may lock them in a state of persistent poverty.

**3.2 Vulnerability as expected poverty**

Policy makers are more concerned about who is likely to be poor in the future inorder to craft the appropriate mitigation policy. The notion of vulnerability as expected utility may not mean much to the policy maker as the individual household utility functions and the utility parameters may be unknown to the policy maker. Hence for the purposes of policymaking there is merit to switch from vulnerability as defined in the utility space to an outcome based measure of vulnerability. Explaining vulnerability as expected poverty is therefore more pragmatic.

Let $P(z, x_t)$ be the household poverty function. While $e_t = z - x_t$ be the difference or the gap between household welfare and the relative poverty line as defined in this paper. The FGT index (Forster, Greer and Thorbecke 1984), determines poverty by this gap. The following proposal would therefore hold

$$V = E\left[\breve{p}(e_{t+1}\right] \ldots\ldots\ldots\ldots\ldots\ldots 12$$

Where V denotes vulnerability $\breve{P}(e_{t+1})$ denotes expected poverty in the future.

3. **Methodology**

**The Empirical Model**

The empirical modelis based on the concept of vulnerability as expected poverty. We define vulnerability as the probability that a household falls in to poverty in the future. Both microfinance participants and non-participants are included in the model in order to address selection issues.

Let the vulnerability of household $h_i$, be $vh_i$, and the relative poverty measure be $wh_i$. We define the vulnerability of household $h_i$ as

$$vh_i = f(wh_i, z, Ph_i)$$

where $z$ is a relative benchmark poverty line as developed in this paper , $Ph_i$ is the probability of household i falling below this bench mark.

Therefore expected vulnerability or decrease in welfare $(v_i)$ can be defined as follows $E(vh_i) = P_i(vh_i) = f(\alpha X_i)$

Where E ($vh_i$) denotes expected individual household vulnerability as a discrete variable, $P_i(vh_i)$ denotes the probability of individual household falling below the bench mark relative poverty line, and $X_i$ denotes variables that are hypothesized to determine vulnerability of households including participation in microfinanceprogrammes, $\alpha$ are the coefficients to be estimated. By employing the model as specified above, the probit model can be applied to provide information about the determinants of household vulnerability.

4.2. **Measuring relative poverty**

International comparability of poverty imply that poverty be measured absolutely. Such measures include the World Bank poverty line of 1.90USD (a recent revision from 1.25USD). However, for policy purposes, poverty is more relative than absolute. Poverty is about unequal access to resources and therefore inequalities. For example, if the

whole “global population” enjoyedhomogenous livelihood standards, regardless of what those standards were, then the issue of poverty would never arise, since there would be nothing more known to be desired. Similarly, policies that pursue growth while reducing inequalities rank highly.

In line with arguments supporting the relevance of relative poverty, we develop an asset (wealth) based relative poverty measure. Assuming that higher wealth index implies higher household welfare, the relative poverty index as developed enables welfare comparability between different households. The wealth indexing methodology is also adapted to the actual assets available within a given community. The more an asset is valued within the community the weightier the index assigned. All available assets are first listed and wealth indices assigned up to a total of 1, for all assets. In the case of the current data, the list of household assets includedlivestock and farm appliance among other household items like furniture and electronics. Motor vehicles and “sophisticated” farm machinery (among other assets) were not included in the list since none of the respondents owned such assets. By use of panel data it was possible to analyze the changes in household welfare within the period of the study.

**4.3 Data**

We use secondary data that was originally collected to study microfinance and welfare in poor rural households. The actual case study was carried out in Makueni County-Kenya in 2014. It is estimated that over 60% of households in the county are poor (Makueni county government 2015). Both formal and informal credit opportunities exist in the form of microfinance and other informal welfare groups commonly known as chamas. Some of the major microfinanceinstitutions that serve the area includeKenya Women Holding, formerly Kenya women finance Trust. KRepBank,and Kadet (Kenya Agency to Development of Enterprise and Technology). All the microfinance respondents received joint liability loans.

The original survey where this secondary data is extracted was designed as an experimental case study that collected panel data. A random sample of respondents from 16 villages in Makuenicounty was used. Both microfinance and non-microfinanceparticipants were included in the sample. In total the data included responses from 200 joint liability microfinance participants and another equal number of responses from non-participants. The original data was collected using Formal Structured questionnaires which were administered every six months in a period of 18 months to both participants and non-participants of microfinance programs.

## Table1: Variables used in the model

| Variable | Name | Definition |
|---|---|---|
| Vul. | Vulnerability (Dependent variable); | Discrete dependent variable, equals 1 if end line household wealth index fell below the baseline wealth index, 0 otherwise |
| Partc | Participation in microfinance programs | Equals 1 if a household participates joint liability lending microfinance programmes, 0 otherwise. |
| Age | Age of head of household | In years |
| Sizehh | Size of household | Number of people living and cooking together |
| Sex | Gender of household head | Gender =1 if male, 0 otherwise |
| Edu | Level of education of household head | Number of years spent in formal schooling by head of household |
| Part.w | Interaction between participation in microfinance and baseline wealth index | Participation multiply by baseline wealth index |
| Agesq | Squared age of head of household | To capture non linear relationship between age of household head and vulnerability to poverty |
| Edusq | Squared number of total years of schooling | To test theory that more education reduces vulnerability |
| Sizehhsq | Squared size of household | To test theory that bigger households are more vulnerable. |

## 4. Results and Discussion

In this study, women composed 75% of the joint liability borrowers. This is not a surprising, outcome as joint liability lending methodology mainly serves those without formal collateral. In a recent publication, the Federation for women lawyers in Kenya (FIDA-K ) hold that: "Among Kenyan communities, women ordinarily do not own land or movable property. At best,their rights are hinged on their relationship to men either as their husbands, fathers or brothers who own and control land, while women are relegated to the right of use only" (FIDA-K 2017).Only 5% of titles are jointly held by both women and men and only 1% of titles is held by women only. While women generally do not own or control land, they provide 89% of all labour for subsistence farming and 70% of all labour for cash crop farming. Thirty two percent of all households in Kenya are headed by women (FIDA-K 2017).
In our sample, there were no significant differences in other socio economic characteristics between microfinanceparticipants and non-participantsexcept on onevariable: gender of household head. Forty seven percent of microfinance participant households were female-headed against only 22% of non-participant households. Even though there is disagreement in literature in terms of whether female-headed households experience more income poverty than male headed households in Africa, there is little dispute that female-headed households: "Have a higher dependency ratio in spite of the smaller average size of the household; they also have fewer assets and less access to resources and also tend to have a greater history of disruption" IFAD (2017)[1].
There were also insignificant differences on other key socio economic variables in our sample. For example the level of education was significantly 10 years of schooling for both participant and non-participants, households sizes were significantly 4 household members, and the mean age for both participants and non-participants was 35 years.
About 88 % of all the respondents reported that business was their main occupation. Most of Makuenicounty is semi-arid and receives very little rainfall. Households have diversified their livelihoods in to off farm activities. Off farm income diversification in rural areas has good effects on household welfare (Eshetu and Mekonnen 2016).

Throughqualitativeresearch we found that there existed some form of "collaborative moral hazard problem" in accessing credit from microfinance institutions. For example, poor households needed money for immediate consumption smoothing which was against the lending regulations of all the microfinanceinstitutions, who purported to only lend for entrepreneurial activity among the poor. However the poor circumvented the regulation with the aid of microfinanceloanofficers from the various institutions who aided in forging non-existent businesses for the purpose of compliance.

About 10% of the sample used at least 75% of the loans for immediate consumption smoothing, another 57% used at least 75% of their loans for productive activity and only 33% used the entire credit for productive activity. Loan repayments consisted of stringent regulations by both borrowers and microfinance institutions. For example there were weekly meetings to collect all due loans, make loaninstallments and mitigate imminent default by any group member. The loan officer would preside over the meetings and would not adjourn till all due loan installments have been redeemed. In case of imminent threat of default for any outstanding loan installment, the group officials were responsible. They would do an immediate fundraising including borrowing from informal money lenders. Redeeming the group is not equivalent to redeeming the individual. The defaulting member faces sanctionsraging from social stigma and threats of exclusion in the next round of borrowing to actual confiscation of private property. Overall repayment rates by jointliability groups stood at 99%. Poor borrowers do not necessarily repay because they are able to, rather it is more because they must repay. To the policy maker, concerns on the socio-economic costs of loan repayment by the poorshould therefore precede any concerns about the ability to pay. In our sample only about 20% of the respondents earned their loan installments through returns from their enterprises, the rest of the sample experienced distress repayments. Distress repayments include borrowing to repay (62%), sale of pre-existing property (17%) and actual confiscation of private property by group members (4%).

**Econometric results**
We attempted to analyze the probability that a households would fall in to future poverty; the following are the probit regression results:

[1] https://www.africanexponent.com/post/single-mothers-in-africa-face-socioeconomic-disadvantages-1524

**Table 2: Econometric Results**

| **Variable** | **coefficient** | **Z** | **Marginal effects** | |
|---|---|---|---|---|
| **Vul.** | | | $\left(dy/dx\right)$ | **z** |
| Partc. | .4244819 (2.704296) | 0.16 | .1056736 (.66817) | 0.16 |
| Age | -.1129655 (.0751314) | -1.50 | -.0282291 (.01877) | -1.50 |
| Sizehh | -.6975584*** (.200274) | -3.48 | -.1743137*** (05002) | -3.49 |
| Sex | -.4375553* (.2464972) | -1.78 | -.1093412* (.06159) | -1.78 |
| Edu | .3022687 (.1877902) | 1.61 | .0755343 (.04693) | 1.61 |
| Parti.w | -0.14456 (0.01256)*** | -1.81 | -.06435 (.00564)*** | -1.81 |
| Agesq | .0009639 (.0009692) | 0.99 | .0002409 (.00024) | 0.99 |
| Sizehhsq | .0402057** (.0181941) | 2.21 | .0100471** (.00454) | 2.21 |
| Edusq | -.0218885** (.0101546) | -2.261 | -.0054697** (.00254) | -2.16 |
| Constant | 3.824171** (1.468682) | 2.260 | | |

**Key:** *** Significant at 1 %**,** ** Significant at 5%**,** * Significant at 10%**;** Standard errors are in parenthesis**Source: data**

Where, vulnerability is the dependent variable[2]. Partcis a dummy variable=1 for microfinance participants, Age is age of household head, sizehh is size of household, sex is dummy =1 for male head of household, edu is the years of schooling for head of household, part.w is the interaction between participation in microfinance programs and the baseline household wealth index, Agesq is the squared age of household head, Sizehhsqis the squared size of household, and edusq is the squared years of schooling for the head of household.

In this model, vulnerability to poverty is explained by the variables as follows: We find a nonlinear relationship between household vulnerability to poverty and household size. As household increase initially, vulnerability to poverty reduces. However when households become too large (tipping point=6 members), household vulnerability to poverty increases. This is a context specific result which could be explained by the fact that in the rural areas, children offer their labour to assist in various socio economic ventures. However, when household is too large beyond the tipping point, the probability of the household falling in to poverty increases.Male headed households have a lesser probability of falling in to poverty compared to female headed households.

A very important result from our study is that the more well-off a household is at the point when they join a microfinance programme the lesser their vulnerability to poverty. This result is derived from the interaction between microfinance participation and household baseline wealth and its impact on vulnerability. Other results imply that the relationship between education and vulnerability to poverty is not linear. Indeed at "low" levels of education we are unable to find a significant relationship between education and vulnerability to poverty. However at higher levels (tipping point 12 years of schooling) education reduces household vulnerability to poverty. Hence we do not have a conclusive result of how for example primary education (considered low level education in the context of this study) affects household vulnerability to poverty. Another interesting finding in this study pertains participation

[2]Refer to the previous section for variable definition.

inmicrofinance programs. Does participation in microfinance programmesexpose households to future vulnerability to poverty?? The result from this particular analysis is also not conclusive. However we are able to conclusively say that household welfare status matters at the point of joining microfinanceprogrmmes. Only the "better off poor" would benefit from such credit.

## 5. Conclusion and policy recommendation

Financial inclusion is critical to achieving inclusive growth. Microfinance services are a key driver to financial inclusion especially for the poor. Microcredit todate dominates microfinance progrrmmes in poor sub-Saharan Africa. Other services like microinsurance, savings and moneytransfer for the poor are not as popular in many parts of sub Saharan Africa. Even in Kenya where financial services are more advanced compared to other countries in sub-Saharan Africa, microcredit still dominates inclusive banking for the poor. Whether through mobile banking or other banking platforms, micro credit still dominates banking activity by the poor. This is counterproductive. Whereas money is fungible and poor peoples' need for financial resources is critical, not all credit is beneficial to the very poor.Through a theoretical and empirical exposition this paper hasdemonstrated that credit to very poor households exposes them to future vulnerability. The paper also argued that, the current framework for joint liability lending results to institutional moral hazard by the microfinance institution. The informal collateral as utilized by solidarity groups "over-insures" loans thereby exposing poor borrowers to more vulnerability. The microfinance institution being a profit maximizer is therefore incentivized to offer indiscriminately subject to membership in a solidarity group. Threatened with imminent default and the fear of loosinga credit resource in the future or compromising on their social networks, mitigation measures by the poor include under investing or de-saving; further compounding the poverty problem.

The role of policy is to provide both ex-ante and ex-post avenues for households to mitigate risks. Regulation for microfinance institutions dealing with poor clients should minimize moral hazard by the institution. Regulations that encourage viable selection of households to solidarity groups should be encouraged. An example of such a regulation would outlaw informal contracts that allow group members to confiscate private property from defaulting members. Regulation should also create incentives to minimize moral hazard by the institutions. One such regulation would for example hold that financial resources even though held as security for loans advanced to solidarity groups, should be held in interest bearing accounts unlike the current scenario where such accounts bear no interest. These are just examples of how policy could address the problem of moral hazard by both solidarity groups and microfinance institution. Regulation in this case is about embedding a cost to incentives of moral hazard.

### Limitation of the study

The main limitation of this study is due to its case study design. We take cognizance of the fact that there could be varying lending modalities to poor people even within the joint liability model. The details of each lending model should be analyzed in the context of existing socio-economic and cultural setting to avoid unnecessary generalizations.

### Areas of further research

Further research should focus on how other complimentary microfinance services like micro insurance, savings and money transfer impact on the poor and whether co-consumption with micro credit improve outcomes for poor people. Literature is also awash with the role of social protection in improving the welfare of the poor. Research should explore whether social protection accelerates and graduates poor-labourendowed households to viability for microfinance services by formal microfinance institutions.

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