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Financial intermediation and financial inclusion of poor households: mediating role of social networks in rural Uganda

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Abstract:
The paper examined the mediating role of social networks in the relationship between financial intermediation and financial inclusion of poor households in rural Uganda. The paper used SPSS (statistical package for social scientist) and applied MedGraph program (Excel version 13), Sobel test, and Kenny & Baron guideline to test for the mediating role of social networks in the relationship between financial intermediation and financial inclusion. Quantitative data were collected from a total sample of 400 poor households living in rural Uganda who were randomly selected for this study. The findings revealed that social networks partially mediate in the relationship between financial intermediation and financial inclusion of poor households in rural Uganda. Besides, social networks and financial intermediation have significant and positive impacts on financial inclusion of poor households in rural Uganda. This implies that some effects of financial intermediation on financial inclusion go through social networks to cause an impact on financial inclusion of poor households in rural Uganda. Therefore, financial institutions such as banks and microfinance institutions should develop financial products and services that promote social networking among poor households in rural Uganda. In addition, they should advocate for participation by poor households in existing village associations and social organizations so has to develop wide social networks. This will help them to gain access to scarce and vital information about available financial services like credit.

Keywords: financial inclusion, social networks, financial intermediation, rural Uganda, poor households, banks and microfinance, financial intermediaries

Introduction:

Based on the argument that financial intermediation is premised on mitigating risks that arise due to lack of perfect information and knowledge in financial markets (Ramakrishnan & Thakor, 1984; Boyd & Prescott, 1986), social networks act as a conduit for information flow and sharing among actors, especially the deficit units who borrow from financial intermediaries.

From the theoretical perspective, social network helps in solving the problem of information asymmetry (Akerlof, 1970), which is rampant in financial markets. Social networks in forms of strong and weak ties act as conduits for information flow and sharing (Granovetter, 1973 & 2004). Indeed, strong & weak ties and structural holes in social networks enrich information flow between different clusters of poor households, therefore, resulting into increased access to resources, markets, and new opportunities as information overlap is minimized (Burt, 2001).

A large body of empirical evidence suggest that social networks significantly impacts on access to and use of financial services provided by financial intermediaries, especially among poor households in rural Uganda (see for e.g. Grootaert & van Bastelaer, 2001). Social networks premised on relations, ties, and interdependence among actors can result into information flow and sharing about scarce resources (see for e.g. Gretzel, 2001; Wasserman & Faust, 1994).

Bourdieu & Wacquant (1992) argue that network ties, which creates trust and fore-bearance among actors can result into access to scarce resources such as credit/loans by poor households (see also Piore & Sabel, 1984). This is supported by Katz et al., (2005) who also observed that frequent interaction among actors in social networks affects flow of information about scarce resources. He further argued that individuals with dense networks encounter great flow of information and ideas about existing opportunities.

Besides, Grootaert & Bastealer (2002) reveal that participation by poor households in local social networks make it easier for them to reach collective action as a result of increase in availability of information that lowers transaction costs and opportunistic behaviour. Therefore, poor households seeking credit may get reliable information about lending institutions from their established network ties.

Furthermore, existing lending institutions may also decide to allocate credit based on non-price considerations (reputation-based). Therefore, they use existing social networks to gain reliable information about the borrowers' characteristics, which helps them to extend credit to poor households with good repayment characters (Narayan & Prittchet, 1997).

Additionally, previous studies like Okten & Osili (2004); van Bastelaer (2000); Karlan (2007); Ahlin & Townsend (2007) indicate that social networks lead to sharing of information about availability of credit opportunities. However, Stiglitz & Weiss (1981) argue that when extending credit, lenders are always concerned with adverse selection and moral hazards. Thus, social networks help to distribute information about credit worthiness and reputation of poor households to lenders (Aryeetey, 2005).

Similarly, Grootaert (2000) also observes that social networks act as a screening device to select clients who are potential borrowers in loan granting process in order to reduce the problem of adverse selection. In addition, Van Tassel (1999); Ghatak (1999) suggest that self-selection among borrowers based on localized information also reduces adverse selection problems. Social networks supply information about the availability of credit sources and feedback about the borrowers' information to the financial intermediaries (see for e.g. Guiso et al., 2004b; Yokoyama & Ali, 2006). Therefore, poor households who are creditworthy with good characters may have access credit (see for e.g. Heikkilä et al., 2009; Karlan, 2007; Fafchamps & Minten, 2002).

More so, Besley & Coate (1995) also posit that sanctions in group lending, which can reduce moral hazards in repayment, may also act as a peer monitoring tool. Indeed, Wydick (2001) observes that peer monitoring between joint liability borrowing groups mitigates moral hazards endemic to credit transactions, especially among microfinance institutions (see also Stiglitz, 1990; Banerjee, Besley & Guinnane, 1994). Conclusively, social networks provide useful information for screening, selecting creditworthy poor households, and peer monitoring, thus, expanding the scope of financial inclusion beyond the current sphere (Ahlin & Townsend, 2007).

Past studies such as Ramakrishnan & Thakor (1984), Boyd & Prescott (1986), DeGennaro (2005), Mishkin (2007), Chandan & Mishra (2010), Ergungor (2006), Kempson et al., (2004), Mathew & Thompson (2008), Rau (2004), Nissanke & Stein (2003), Stiglitz & Greenwald (2003), Menkhoff (2000), reveal that financial intermediation by banks affect the level of financial inclusion, especially in developing countries like Uganda. Unfortunately, these studies ignore the role played by social networks as a conduit for information flow in mediating in the relationship between financial intermediation and financial inclusion of poor households. Therefore, the main purpose of this study is to examine the mediating role of social networks in the relationship between financial intermediation and financial inclusion of poor households in rural Uganda.

Literature review:

Financial intermediation and financial inclusion: social networks as medaitor

With prevalence of asymmetric information, which is common in financial markets between the lenders and the borrowers, financial intermediaries such as banks may prefer not to lend due to fear of adverse selection and moral hazard.

However, Granovetter (2004) asserts that a dense network of personal ties that secures trust and acts as a conduit for flow and sharing of useful information, is crucial for such complex transactions. Furthermore, Homans (1974) also contends that frequency of interaction, a characteristic feature of close-knit networks, lowers the cost of monitoring members of the group, as information about members' conduct is common knowledge.

Floro & Yotopolous (1991) observe that social ties and the resulting potential for sanctions between poor households help to mitigate adverse selection and moral hazard problems in joint liability lending contract, especially when borrowers enjoy a social leverage with one another that extends beyond the lending contract.

Indeed, social networks between poor households are essential tools for screening loan applications and for ensuring that contracts are enforced (Karlan, 2007). Ahlin & Townsend (2007) reveal that social ties (measured by sharing among non-relatives, cooperation, clustering of relatives, and village-run savings and loan institutions) through stronger social sanctions improve repayment rates. Furthermore, Aryeetey (1996) also suggests that pressure to repay a loan, which is directly linked to peer monitoring mechanism based on existing social networks, reduces the problem of default and, thus, increase access to more financial services by poor households.

This is supported by Ghatak & Guinnane (2001) who observe that availability of information through social networks helps to solve problems related to providing loans and enhancing capacity of the poor to access credit. Networks help bank staff to separate good and bad borrowers in order to reduce the problems of adverse selection and moral hazards in lending. Banks use local networks of information to identify poor households with ability to repay loans (de Aghion & Gollier, 2000; Ghatak, 2000; Sadoulet, 1998).

van Bastelaer (2000) also argues that networks increases the capacity for accessing the market information and reduces the search cost, hence enhancing the linkage among credit stakeholders and creating tie networks among members in lending groups (see also

Yokoyama & Ali, 2006). Thus, Grootaert (2001) contends that networks provide information about existing sources of financial services among poor households in rural areas. Evidently, social networks help the poor people to access credit as well as encourage them to follow the repayment schedule of the lenders. Therefore, here we hypothesize that:

H1: There is a significant and positive relationship between financial intermediation and social networks.

H2: Social networks significantly mediates the relationship between financial intermediation and financial inclusion.

Financial intermediation and financial inclusion

According to Matthews & Thompson (2008), financial intermediation is the process, which involves surplus units depositing their funds with financial institutions such as banks who then lend it to deficit units.

Thus, DeGennaro (2005) observes that financial intermediaries such as banks acquire information that is not readily available in the market from surplus and deficit units who would have transacted directly and use it to intermediate between the surplus and deficit unit (see also Ramakrishnan & Thakor; 1984; Boyd & Prescott, 1986).

Therefore, in a bid to scale-up financial inclusion of poor households, scholars and promoters such as Beck et al., (2009), Demirguc-Kunt & Klapper (2012), Sarma (2010), Kendal et al., (2010), Thorat (2007), World Bank (2014), UNDP (2006) argue that efforts should be directed towards supply side strategies. This is supported by CGAP (2013) who observes that poor people also use formal financial intermediaries like banks. This is confirmed by the fact that the poor can save, borrow, and make payments (ACCION, 2011).

Indeed, Mishkin (2007) suggests that opening up of numerous bank branches and entering of other financial services' providers in the financial market, can pave way for provision of varieties of financial products and services that suite the economic status of the poor.

Besides, Chandan & Mishra (2010), Ergungor (2006), Kempson et al., (2004) reveal that presence of financial institutions' structures such as offices, branches, and personnel may result into increased provision and access to financial services by the majority poor, especially in rural areas.

Additionally, Mathew & Thompson (2008); Rau (2004); Nissanke & Stein (2003); Stiglitz & Greenwald (2003); Menkhoff (2000) conclude that banks as financial intermediaries, pool funds from surplus units and lend to deficit households including the poor. Rau (2004) argued that banks use the available information in screening and defining its new clients including the poor, to whom it extends financial services, thus, widening the scope of financial inclusion. Therefore, here we hypothesize that:

H3: There is a significant and positive relationship between financial intermediation and financial inclusion.

Social networks and financial inclusion

Social networks are found to be important elements through which most financial services' providers extend basic financial services, especially to poor households (van Bastelaer, 2000). Biggs, Raturi & Srivastava (2002) suggest that in accessing financial services, social networks help poor households by supplying information and it acts as a mechanism for enforcement (See also Narayan & Prittchet, 1997).

According to Grootaert & Bastealer (2002), participation by individuals in local networks makes it easier for any group to reach collective action because of availability of

information that lowers transaction costs and opportunistic behaviour. Existing networks of members enhances availability of information about sources of financial services such as credit and their providers (Okten & Osili, 2004).

Aryeetey (2005) also argues that social networks help distribute information about credit worthiness and characters of individuals to lenders. Social networks act as a borrower screening device for selecting potential clients in the lending process (see Grootaert, 2001; Stiglitz & Weiss, 1981). Through this, the poor who are creditworthy with good characters are able to secure and access loans from lenders (see Heikkilä et al., 2009; Fafchamps & Minten, 2002). Besides, social networks between group members are an essential tool for screening loan applications and for ensuring that contracts can be enforced (Karlan, 2007).

Furthermore, Ahlin & Townsend (2007) also observe that social ties actually reduce repayment rates, though stronger social sanctions improve them. The success of programs of microfinance such as Grameen Bank in Bangladesh, BancoSol in Bolivia offers a better example (Gomez & Santor, 2001). Homans (1974) also argues that frequency of interaction, a characteristic feature of close-knit networks, lowers the cost of monitoring members of the group, as information about members' conduct is common knowledge.

van Bastelaer (2000) further suggests that social networks increases the capacity for accessing the market information and reduces the search cost hence enhancing the linkage among credit stakeholders and creating tie network among members in lending groups. Social networks provide information about existing sources of financial services among members in the society. Therefore, here we hypothesize that:

H4: There is a significant and positive relationship between social network and financial inclusion.

Insert Figure 1 here

Resaerch methodology:

Research design

The study adopted a cross-sectional research design to answer hypotheses developed in this study. This design was chosen because it does not suffer from re-current mistakes in data collection instruments and unavailability of samples used in previous observation common with longitudinal research design (Creswell, 2009). Quantitative data were collected from poor households located in rural Uganda in order to test for hypotheses generated under this study.

Population, sample size and sampling methods

The population for this study consisted of 1.2 million poor households drawn from northern, eastern, central (excluding Kampala), and western Uganda as stipulated by Uganda Bureau of Statistics National Household Survey (UBOS, 2012). Therefore, a total sample comprising of 400 poor households was selected for this study. The sample size was arrived at using formulae derived from Yamane (1973). The formulae used was stated as $n = [N/1+N (e)^2]$, where, n = sample size; N = total population; e = tolerable error (0.05 or 95%).

The study applied a three stage sampling procedure to identify poor households for this study. Multi-stage sampling technique using regions, districts, and villages was used to identify poor households to be sampled. The sampled poor households were identified based on UBOS enumeration maps used in 2014 National population census. Thereafter, stratified

sampling method was applied to select 4 villages. After identifying the villages, simple random sampling technique was used to pick the required number of poor households from each village. The selected poor households for the study were assigned unique numbers for ease of identification. In addition, three poverty indicators of households' utilities, housing conditions, and households' welfare were applied to identify the sample for this study (UBOS, 2012). The above selection criteria were used until a sample size of 400 poor households was obtained. The unit of analysis for the study were poor households and the unit of inquiry were poor household heads.

Data collection instruments

The quantitative data for this study were collected using semi-structured questionnaires. This was to obtain additional information on the characteristics and perceptions of the respondents about the study variables. The questionnaire was first pre-tested before using it for the final study. Thus, all negatively worded, difficult, and ambiguous items were removed from the final questionnaire. Besides, items used in the questionnaire were adopted and modified based on past scholarly work. Data were collected between March & June, 2014 from the eight (8) districts of northern, eastern, central (excluding Kampala), and western Uganda. Therefore, a response rate of 100 percent was achieved since the questionnaires were directly administered to the selected respondents by the researcher with the help of research assistants who were also interpreters. In addition, the high response rate was achieved because data were collected through the local council chairpersons located in each of the villages.

Measurements of study variables

Measures for the different variables were identified from literature review and conceptualization. The measures for financial intermediation, social networks, and financial inclusion were set on scales in line with Sarantokos (2005). All the variables under this study were operationalized based on previous scholars.

Financial intermediation was measured using the dimensions of market penetration level and quality of services as adopted from previous scholars such as Dutta & Dutta (2011), Allen et al., (2011), Yaron, Benjamin & Piprek (1997). All the items developed in the questionnaires under each construct were anchored onto a 5-point Likert scale of strongly agree (5), agree (4), not sure (3), disagree (2), and strongly disagree (1). The scales for financial intermediation were tested for reliability ($\alpha = 0.891$) and validity (total variance explained by five convergent factors = 83.5 percent).

Social network among the poor was measured using the dimensions of interaction, interdependence, and ties as stipulated by Wasserman & Faust (1994); Biggs, Raturi & Srivastava (2002); Narayan & Prittchet, 1997); Grootaert & Bastealer (2002). The measures for social networks were anchored onto a 5 point Likert scale of strongly agree (5), agree (4), not sure (3), disagree (2), and strongly disagree (1). The scales for social networks were subjected to both reliability ($\alpha = 0.925$) and validity (total variance explained by three convergent factors = 85 percent) tests.

Financial inclusion was measured based on scales developed by Ardic et al., (2011); Kendall et al., (2010); Beck et al., (2008), which were found to be reliable and valid. The dimensions of access, quality, usage, and welfare were used for measuring financial inclusion. The respondents were asked based on a 5-point Likert scale of strongly agree (5), agree (4), not sure (3), disagree (2), and strongly disagree (1). The items scales were tested for reliability ($\alpha = 0.938$) and validity (total variance explained by four convergent factors = 88 percent).

Data management

This involved data capturing, checking for errors in the data file, and correcting them (Field, 2005; Pallant, 2005; Hair et al., 2010). Raw data collected from the field were captured into Statistical Package for Social Scientists (SPSS version 20) in order to generate the necessary statistics.

Screening for missing values, outliers, and normality checks were performed. According to Field (2005), missing values arises from lack of response on certain questions due to difficulty in understanding the questions. Besides, outliers are values that tend to be greater than the values on the chosen scale. Therefore, presence of both missing values and outliers in the data may affect multivariate analysis if not properly managed. Cases amounting to 57 were missing at completely random (MCAR) and less than 5%, which were replaced by linear interpolation (Field, 2005). However, no outliers were present in the data.

Test for normality using the histogram and normal p-p plots were also performed. The results indicated that the data were normally distributed with the histogram being bell-shaped and normal p-p plots having all values falling along the straight line. In addition, results of descriptive statistics, correlations, and regressions were also generated.

Furthermore, the mediating role of social networks was tested using the Sobel test based on principles recommended by Baron & Kenny (1986). Furthermore, the results were plotted on MedGraph Excel program developed by Jose (2008). Prior to the main data analysis, no items were reverse coded since there were no negatively worded questions in the questionnaire.

Common method bias

Statistically, common method bias was tested using Herman's single-factor test. The results yielded 14 factors with eigen values >1 and total variance explained 79 percent variations in financial inclusion. Indeed, no factor emerged dominant within the factor analysis model (Podsakoff et al., 2003).

Procedurally, common method bias was controlled by defining ambiguous/unfamiliar terms and vague concepts. The questions with many words in the questionnaire were re-worded to keep them simple, specific, and concise. Besides, all double barrelled questions were eliminated from the questionnaire used in the main study (Tourangea et al., 2000; Spector, 2006). The scale anchors used in the pilot study were maintained to avoid changes in the meaning of constructs and potential compromise on validity.

Test to establish existence of mediating effect

Mediating effect may exist if the predictor variable accounts for certain amount of variance in the mediator variable, and the mediator variable caters for variance in the dependent variable. Mafabi (2012) observes that the mediator variable transforms the effect of the predictor variable onto the dependent variable, thus, causing a response in the outcome variable. Thus, in testing for the mediating effect of social networks in the relationship between financial intermediation and financial inclusion, the MedGraph method by Jose (2008) was adopted in this study.

Baron and Kenny (1986) recommended four conditions that must be satisfied before proceeding to test for mediating effect. These include: 1) existence of a significant relationship between the predictor and outcome variables; 2) existence of a significant relationship between predictor and mediator variables; 3) existence of a significant relationship between mediator and outcome variables; and 4) to establish whether independent variable reduces and become insignificant when the mediator variable is entered into the structural model.

Thus, a situation of full mediation will only exist if the predictor variable decreases and become insignificant under condition 4. For partial type of mediation, the predictor variable will reduce and remain significant. Both direct and indirect effect of the predictor variable on the dependent variable will be evident. The direct effect means that the independent variable will affect the criterion variable through a direct path, while the indirect effect means some impact of the predictor variable onto the criterion variable passes through the mediator variable. Thus, from this study, there was a partial mediating role of social networks in the relationship between financial intermediation and financial inclusion of poor households in rural Uganda.

Results:

Response rate and sample characteristics

The results indicated that 100 percent response rate was achieved in this study since data were collected from all targeted 400 poor households selected for the study. Besides, the results revealed that 64 percent of poor households were headed by men, while 36 percent by women. Furthermore, the results showed that 37 percent of the respondents were in the 26-33 age bracket, while 26 percent were in the 34-41 age bracket. The findings also revealed that 23 percent were in the 42-49 age bracket, and 9 percent were in 18-25 age bracket with only 5 percent in 50+ age bracket. More so, the results indicated that 54 percent of poor households used firewood as their main source of cooking fuel, while 45 percent used charcoal. The results also showed that 0.5 percent of the poor households used paraffin and other sources of fuel (bio-gas) respectively for cooking. On the aspect of being able to read and write, the results revealed that 60 percent of the households' heads who responded in the study were able to read and write, while 40 percent could not read and write. The results are indicated in table 1 below.

Insert Table 1 here

Exploratory factor analysis

The results from exploratory factor analysis (EFA) revealed that three items of market penetration loaded on factor 1 with significant loadings of .915, .942 & .945, which explained 39% of the variance, while three other items of quality-assurance loaded on factor 2, with significant loadings of .806, .807 & .878, which explained 18% of the variance, and three more items of quality-reliability loaded on factor 3 with significant loadings of .743, .792 & .840, which explained 11% of the variance. Besides, three other items of quality-responsiveness loaded on factor 4 with significant loadings of .702, .885 & .893, which explained 8% of the variance. Finally, two other items of quality-tangibility significantly loaded on factor 5, which explained 7% of the variance. However, 28 items with Eigen values of less than 1 and absolute value below .50 were dropped and not included in the final factor analysis as they could not load well with the other factors. Therefore, overall the five factors of financial intermediation accounted for 83% of the total variance.

Furthermore, the results also showed that three factors of ties (63%), interactions (15%), and interdependence (8%) were generated, thus, accounting for 85% of the total variance in social networks. The results further revealed that three items of ties loaded well on factor 1 with significant loadings of .790, .849 &.881, which explained 63% of the variance, and four other items of interactions loaded well on factor 2 with significant loadings of .721, .732, .830 & .848, which accounted for 15% of the variance. Finally, two other items

of interdependence loaded well on factor 3 with significant loadings of .708 & .715, which accounted for 8% of the variance.

Finally, the results indicated that three items of quality loaded on factor 1 with significant loadings of .804, .807 & .837, which explained 65% of the variance. In addition, three other items of welfare loaded on factor 2, with significant loadings of .682, .813 & .848, which explained 9% of the variance, while two other items of access loaded on factor 3 with significant loadings of .821 & .851, which explained 8% of the variance. Further, two more items of usage significantly loaded on factor 4 with significant loadings of .811 & .820, which explained 6% of the variance. Therefore, overall, the four factors of financial inclusion accounted for 88% of the total variance.

Correlation analysis

The correlation analysis results indicated that financial intermediation is significantly and positively associated with financial inclusion ($r = 0.439$, $p<0.01$), therefore, rendering support for hypothesis (H3) of the study. This finding is in line with Chandan & Mishra (2010) who reveal that presence of financial institutions' structures such as offices, branches, and personnel may result into increased provision and access to financial services by the majority poor, especially in rural areas.

Further analysis of the correlation results also revealed that financial intermediation is significantly and positively related with social networks ($r = 0.175$, $p<0.01$), thus, confirming hypothesis (H1) of the study. Indeed, social networks help bank staff to separate good and bad borrowers in order to reduce the problems of adverse selection and moral hazards in lending. Banks use local networks of information to identify poor households with ability to repay loans (de Aghion & Gollier, 2000; Ghatak, 2000; Sadoulet, 1998).

Besides, the results showed that social networks is significantly and positively related with financial inclusion ($r = 0.461$, $p<0.01$). This supports hypothesis (H4) of the study. Grootaert (2001) argues that social networks provide information about existing sources of financial services among poor households in rural areas. Evidently, social networks help the poor people to access credit as well as encourage them to follow the repayment schedule of the lenders. The correlation analysis output is indicated in table 2 below.

Insert Table 2 here

Mediation test results

Results were generated to test for the mediating effect of social networks in the relationship between financial intermediation and financial inclusion. Besides, test for four conditions set by Baron & Kenny (1986) for mediation to proceed were carried out by running regression analysis between the predictor, mediator, and outcome variables. The results indicated that Baron & Kenny (1986) conditions were met and tenable. In addition, the MedGraph excel program by Jose (2008) was also used to compute the Sobel *z*-value, significance, and nature of mediation effect of social networks in the relationship between financial intermediation and financial inclusion relationship. The test results are shown in figure 1 below.

The findings from the hierarchical regression analysis in table 3 below revealed that there is a significant relationship between financial intermediation and social networks as shown in model 1 ($\beta = 0.175$, $p<0.05$).

Further, the results in the second model also showed that financial inclusion and financial intermediation are significantly related ($\beta = 0.439$, $p<0.01$).

Besides, the results in the third model indicated that the effect of social networks on both financial intermediation and financial inclusion is significant ($\beta = 0.397$, $p<0.01$).

The effect of financial intermediation falls but remains significant ($\beta = 0.369$, $p<0.01$). This is a confirmation that when the Beta coefficients reduces and remains significant, mediation exists and its partial (Baron & Kenny, 1986). Therefore, the regression model has met and satisfied the condition for mediation and we can conclude that social networks mediate the relationship between financial intermediation and financial inclusion.

Insert Table 3 here

Besides, to establish the significance of the mediation effect and nature of mediation, the coefficients, beta, and standard errors of financial intermediation and financial inclusion as being mediated by social networks was determined using MedGraph Excel program.

The MedGraph test results revealed that there was a significant impact of social networks in the relationship between financial intermediation and financial inclusion. The Sobel *z*-value of 2.345 with *p*-value of 0.0189 indicated that mediation by social networks existed in the relationship between financial intermediation and financial inclusion.

The relationship between financial intermediation and financial inclusion has significantly reduced from 0.439 to 0.369 (in models 2 & 3), indicating that when social networks is added into model 3, the impact of financial intermediation on financial inclusion is reduced, but remains significant as indicated in table 3 above. The nature of mediation experienced was partial since the standardized coefficient of financial intermediation reduced from 0.439 to 0.369, but remained significant. This confirms that when social networks is included in the equation in model 3, there is some effect of financial intermediation on financial inclusion that goes through social networks to cause a change in financial inclusion as indicated in figure 2 below.

This finding is supported by Aryeetey (1996) who observes that pressure to repay a loan, which is directly linked to peer monitoring mechanism based on existing social networks, reduces the problem of default and, thus, increase access to more financial services by poor households. In addition, Ahlin & Townsend (2007) also argue that social ties (measured by sharing among non-relatives, cooperation, clustering of relatives, and village-run savings and loan institutions) through stronger social sanctions improve repayment rates.

Insert Figure 2 here

Discussion and conslusion:

The study examined the mediating role of social networks in the relationship between financial intermediation and financial inclusion in rural Uganda.

The findings from the study indicated that social networks partially mediates in the relationship between financial intermediation and financial inclusion. This implies that not all the direct effects go through financial intermediation as the main predictor but some effects also go through social networks to cause a change in financial inclusion. Thus, there is both direct and indirect effects of predictor variable (financial intermediation) on financial inclusion of poor households in rural Uganda through social networks. The finding is consistent with Ghatak & Guinnane (2001) who argue that availability of information through

social networks help solve the problem related to providing loans to poor households and enhances their capacity for accessing the credit from financial intermediaries such as banks. Furthermore, de Aghion & Gollier (2000) also observe that banks use local networks of information to identify the borrowers as well as their ability to repay the loans (see also Ghatak, 2000; Sadoulet, 1998). Besides, Floro & Yotopolous (1991) observe that social ties and the resulting potential for sanctions between poor households help to mitigate adverse selection and moral hazard problems in joint liability lending contract, especially when borrowers enjoy a social leverage with one another that extends beyond the lending contract. This finding lends support to hypothesis (H2) derived under this study.

Furthermore, the results from the study also showed that financial intermediation and social networks are significantly and positively related. This links well with the argument that financial intermediation is premised on mitigating risks that arise due to lack of perfect information and knowledge in the market (Ramakrishnan & Thakor, 1984; Boyd & Prescott, 1986). Therefore, social networks act as a conduit for information flow and sharing among actors, especially the poor households (deficit units) who borrow from financial intermediaries. From the theoretical perspective, social networks helps in solving the problem of information asymmetry (Akerlof, 1970), which is rampant in the financial market. Indeed, social ties and the resulting potential for sanctions between poor households help mitigate adverse selection and moral hazard problems in joint liability lending contracts. This finding is consistent with hypothesis (H1) stated in this study.

Besides, the results revealed that there is a significant and positive relationship between financial intermediation and financial inclusion. This supports our hypothesis (H3) of the study. DeGennaro (2005) contends that financial intermediaries such as banks acquire information that is not readily available in the market from surplus and deficit units who would have transacted directly and use it to intermediate between the surplus unit and deficit unit such as the poor, therefore, enhancing access to and use of financial services. Thus, in a bid to scale-up financial inclusion of poor households, scholars and promoters such as Beck et al., (2009), Demirguc-Kunt & Klapper (2012), Sarma (2010), Kendal et al., (2010), Thorat (2007), World Bank (2013), UNDP (2006), suggest that efforts should be directed towards supply side strategies. This is supported by CGAP (2013) who observes that poor people also use formal financial intermediaries like banks. This is confirmed by the fact that the poor can save, borrow, and make payments (ACCION, 2011). Mishkin (2007) suggests that opening up of numerous bank branches and entering of other financial service providers in the financial market, can pave way for provision of varieties of financial products and services that suite the economic status of the poor. Indeed, financial intermediaries like banks use the available information in screening and defining its new clients including the poor, to whom it extends financial services, thus, widening the scope of financial inclusion, especially in rural Uganda.

The study results also indicated that social networks and financial inclusion are significantly and positively related. Biggs, Raturi & Srivastava (2002) suggest that in accessing financial services, social networks help poor households by supplying information and it acts as a mechanism for enforcement. Grootaert & Bastealer (2002) observe that participation by individuals in local networks makes it easier for any group to reach collective action because of availability of information that lowers transaction costs and opportunistic behaviour in borrowing. Thus, existing networks of members enhances availability of information about sources of financial services such as credit and their providers (Okten & Osili, 2004). Additionally, van Bastelaer (2000) suggests that social networks increases the capacity for accessing the market information and reduces the search cost hence enhancing the linkage among credit stakeholders and creating tie networks among members in lending groups. Furthermore, Karlan (2007) argues that social networks between group members are

an essential tool for screening loan applications and for ensuring that contracts can be enforced. This is supported by Besley & Coate (1995) who argue that sanctions in group lending, which can reduce moral hazards in repayment acts as a peer monitoring tool. Peer monitoring between joint liability borrowing groups mitigates moral hazards endemic to credit transactions, especially among microfinance institutions (Wydick, 2001; Stiglitz, 1990; Banerjee, Besley & Guinnane, 1994). Indeed, social networks provide useful information for screening, selecting creditworthy poor households, and peer monitoring, thus, expanding the scope of financial inclusion beyond the current sphere. This result offers support for hypothesis (H4) of the study which stated that there is a significant relationship between social networks and financial inclusion in rural Uganda.

Research implications:

The findings suggest that for better understanding, its always necessary to interprete the effect of a third variable (mediator) in the relationship between the predictor and outcome variables under study. Indeed, it is always assumed that a third factor will exert an effect on a outcome variable, especially under different contexts. Therefore, the findings revealed that social networks mediates in the relationship between financial intermediation and financial inclusion. Thus, the results may help managers of financial institutions, policy makers, and practitioners to capitalize on existing social networks among poor households in order to smoothen the financial intermediation process and scale-up access and use of financial services, especially in rural Uganda among the under-banked and unbanked communities. Besides, social networks act as a screening tool in selecting creditworthy borrowers to be included in group lending. Furthermore, social networks also supply information about the availability of credit and feedback about the borrowers' information to the financial intermediaries. Therefore, all these promote outreach and thus, financial inclusion of poor households who are underserved by formal financial institutions.

Study limitations:

The study used quantitative data and ignored data collected from qualitative source. Therefore, use of qualitative data may be adopted in future studies. Furthermore, the study was cross-sectional in nature, thus, future study may use longitudinal research design to provide detailed insight into the variables under study. Besides, analysis using confirmatory factor analysis (CFA) and structural equation modelling (SEM) may be adopted in future studies to investigate the mediating role of social networks in the relationship between financial intermediation and financial inclusion.

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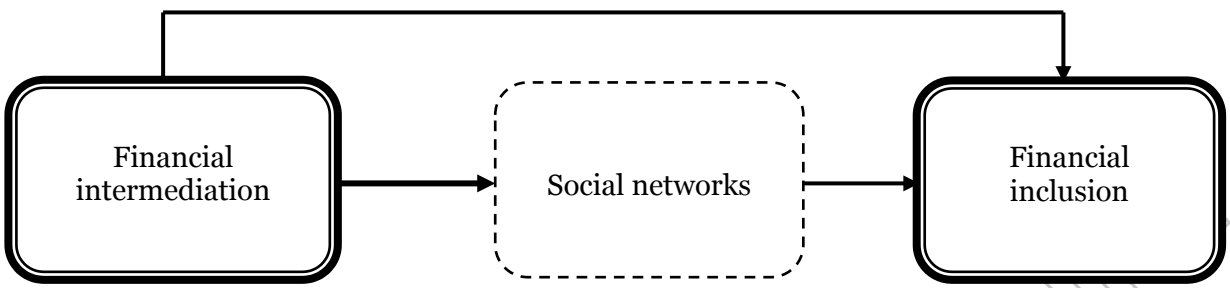
Figure 1: Conceptual model for the study



Source: Developed by Authors

Figure 2: showing MedGraph results for mediating impact of social network in the relationship between financial intermeditaion and financial inclusion

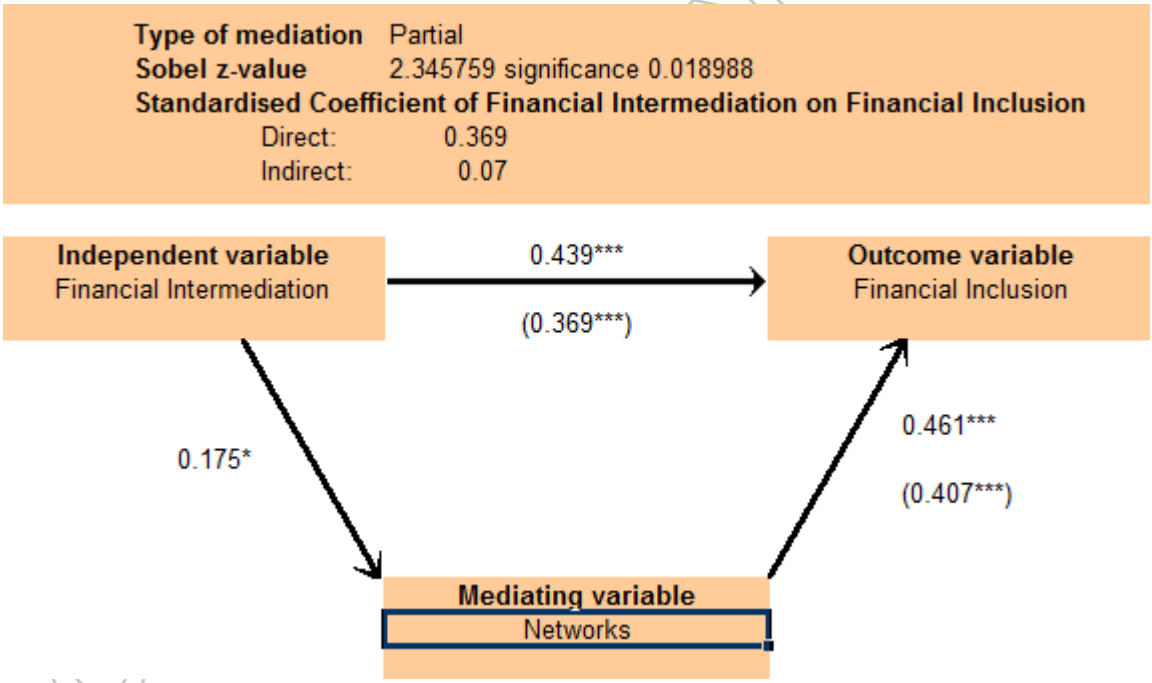


Table 1: Sample characteristics of respondents

	Frequency	%	Cumulative %
Gender			
Male	256	64	64
Female	144	36	100
Total	400	100	
Age			
18-25 years	36	9	9
26-33 years	148	37	46
34-41 years	104	26	72
42-49 years	92	23	95
50+ years	20	5	100
Total	400	100	
Cooking fuel			
Firewood	216	54	54
Charcoal	180	45	99
Paraffin	4	0.5	99.5
Others e.g. Bio gas	4	0.5	100
Total	400	100	
Ability to read & write			
Yes	240	60	60
No	160	40	100
Total	400	100	

Table 2: Pearson's correlation results

	N	Mean	Std. Dev	1	2	3
Financial intermediation (1)	400	3.55	.556	1.000		
Social networks (2)	400	3.79	.554	.175**	1.000	
Financial inclusion (3)	400	3.66	.496	.439**	.461**	1.000

** Correlation is significant at the 0.01 level (2-tailed); n = 400

Table 3: Hierarchical regresion analysis for the variables

	Dependent variable: financial inclusion			
Variables	Model 1	Model 2	Model 3	VIF
Intercept	0.175*	0.452**	0.381**	
Financial intermediation	0.439**	0.369**	1.428	
Social networks		0.397**	1.340	
R^2		0.192	0.345	
Adjusted R^2		0.188	0.338	
ΔR^2		0.192	0.153	
ΔF		47.190**	45.902**	
SE		0.066	0.060	

Notes: $n = 400$; $^{**}p<0.01$, $^{*}p<0.05$

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World Bank Global Findex Data (2014) indicates that about 3 Billion poor households still remains excluded from access to basic financial services with 80% living in Sub-Saharan Africa. A financial inclusion insights survey revealed that only 11 out of every 100 adults in Uganda have access to a bank account, and only 7 out of every 100 adults are active users of these accounts (FSDU, 2016). Thus, financial inclusion working groups have advocated for improved financial intermediation to provide varieties of financial products that suits the economic status of the poor. The study revealed that social networks boost financial intermediation for better financial inclusion. Therefore, banks should develop financial products that promote social networking among poor households. In addition, they should advocate for participation by poor households in existing village associations and social organizations through which they can gain access to scarce and vital information about availability of financial services.