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*Corresponding author: George Okello Candiya Bongomin, Department of FGSR, Makerere University Business School (MUBS), Kampala, Uganda
E-mail: abaikol3@yahoo.co.uk

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

George Okello Candiya Bongomin^{1*}, Joseph Mpeera Ntayi², John C. Munene¹ and Charles Malinga Akol³

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



George Okello Candiya Bongomin

ABOUT THE AUTHORS

George Okello Candiya Bongomin holds a PhD, MSc and Bachelor's degree in Commerce from Makerere University Kampala, Uganda. His research interests are in financial literacy, digital financial services, development finance, business finance, rural finance, behavioural finance, institutional economics and business psychology.

Joseph Mpeera Ntayi, PhD, is a professor of procurement and logistics management at Makerere University Business School, Kampala, Uganda. His research interests are in logistics, financial engineering, entrepreneurship, public procurement, managing contracts, business ethics and supply chain management.

John C. Munene, PhD, is a professor of psychology and co-ordinator PhD programs, Graduate and Research Centre, Makerere University Business School (MUBS), Kampala, Uganda. His research interests are in industrial and organizational psychology.

Charles Malinga Akol, MBA, is a director of currency at Bank of Uganda (BoU) and a part-time lecturer at Makerere University Business School, Kampala, Uganda. He has rich experience in financial management, financial markets, and money & banking.

PUBLIC INTEREST STATEMENT

World Bank Global Findex Data (2014) indicates that about 3 Billion poor households still remain 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.

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 as to develop wide social networks. This will help them to gain access to scarce and vital information about available financial services like credit.

Subjects: Sociology; Social Psychology; Economic Psychology; Research Methods in Development Studies; Sustainable Development; Economics and Development; Economics; Finance; Business, Management and Accounting

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

1. 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 (Boyd & Prescott, 1986; Ramakrishnan & Thakor, 1984), 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 impact on access to and use of financial services provided by financial intermediaries, especially among poor households in rural Uganda (see for e.g. Grootaert & 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 and Wacquant (1992) argue that network ties, which creates trust and forbearance among actors can result into access to scarce resources such as credit/loans by poor households. This is supported by Katz, Lazer, Arrow, and Contractor (2005) who also suggest that frequent interaction among actors in social networks affects flow of information about scarce resources. They further argue that individuals with dense networks encounter great flow of information and ideas about existing opportunities.

Besides, Grootaert and Bastelaer (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). Thus, 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 & Pritchett, 1997).

Additionally, previous studies like Okten and Osili (2004), van Bastelaer (2000), Karlan (2007) and Ahlin and Townsend (2007) indicate that social networks lead to sharing of information about

availability of credit opportunities. However, Stiglitz and 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 (2001) also observes that social networks act as a screening device used 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, Sapienza, Zingales, & Macelli, 2004; Yokoyama & Ali, 2006). Therefore, poor households who are creditworthy with good characters may have access to credit (see for e.g. Fafchamps & Minten, 2002; Heikkilä, Kalmi, & Ruuskanen, 2009; Karlan, 2007).

More so, Besley and 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) elucidates that peer monitoring between joint liability borrowing groups mitigates moral hazards endemic to credit transactions, especially among microfinance institutions (see also Banerjee, Besley, & Guinnane, 1994; Stiglitz, 1990). 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 and Thakor (1984), Boyd and Prescott (1986), DeGennaro (2005), Mishkin (2007), Chandan and Mishra (2010), Ergungor (2010), Kempson, Atkinson, and Pilley (2004), Mathews and Thompson (2008), Rau (2004), Nissanke and Stein (2003), Stiglitz and Greenwald (2003) and 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.

2. Literature review

2.1. Financial intermediation and financial inclusion: social networks as mediator

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 and 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 and 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 and 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. Social networks help bank staff to separate good and bad borrowers in order to reduce the problems of adverse selection and moral hazard 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 social networks increase 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 social networks provide information about existing sources of financial services among poor households in rural areas. Evidently, social networks help the poor 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.

2.2. Financial intermediation and financial inclusion

According to Mathews and 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 Boyd & Prescott, 1986; Ramakrishnan & Thakor, 1984).

Therefore, in a bid to scale-up financial inclusion of poor households, scholars and promoters such as Beck, Demirguc-Kunt, and Honahan (2009), Demirguc-Kunt and Klapper (2012), Sarma (2010), Kendall, Mylenko, and Ponce (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 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.

Besides, Chandan and Mishra (2010), Ergungor (2010), 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, Mathews and Thompson (2008); Rau (2004); Nissanke and Stein (2003); Stiglitz and Greenwald (2003); Menkhoff (2000) also conclude that banks as financial intermediaries, pool funds from surplus units and lend to deficit households including the poor. More specifically, Rau (2004)

argues 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.

2.3. Social networks and financial inclusion

Social networks are found to be important elements through which most financial service providers extend basic financial services, especially to poor households (van Bastelaer, 2000). Biggs, Raturi, and 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 & Pritchett, 1997).

According to Grootaert and Bastelaer (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. Indeed, existing networks of members enhance availability of information about sources of financial services such as credit and their providers (Okten & Osili, 2004).

Similarly, 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 Fafchamps & Minten, 2002; Heikkilä et al., 2009). Besides, social networks between group members are an essential tool for ensuring that contracts can be enforced (Karlan, 2007).

Furthermore, Ahlin and Townsend (2007) also observe that social ties reduce repayment rates, though stronger social sanctions improve them. The success of programs of microfinance such as Grameen Bank in Bangladesh and 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.

Conclusively, van Bastelaer (2000) suggests that social networks increases the capacity for accessing 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 networks and financial inclusion.

3. Research methodology

3.1. 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 recurrent 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.

3.2. 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 four 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.

3.3. 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% 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.

3.4. 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 Sarantakos (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 and Dutta (2011), Allen et al. (2011) and Yaron, Benjamin, and Piprek (1997). All the items developed in the questionnaires under each construct were anchored onto a five-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%).

Social networks among the poor were measured using the dimensions of interaction, interdependence, and ties as stipulated by Wasserman and Faust (1994), Biggs et al. (2002), Narayan and Pritchett (1997) and Grootaert and Bastelaer (2002). The measures for social networks were anchored onto a five-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%) tests.

Financial inclusion was measured based on scales developed by Ardic, Heimann, and Mylenko (2011), Kendall et al. (2010) and Beck, Demirgüç-Kunt, and Martinez Peria (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 five-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%).

3.5. Data management

This involved data capturing, checking for errors in the data file, and correcting them (Field, 2005; Hair, Anderson, Tatham, & Black, 2010; Pallant, 2005). 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 arise 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 and Kenny (1986). In addition, the results were also 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.

3.6. 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% variations in financial inclusion. Indeed, no factor emerged dominant within the factor analysis model (Podsakoff, MacKenzie, Lee, & Podsakoff, 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 (Spector, 2006; Tourangeau, Rips, & Rasinski, 2000). The scale anchors used in the pilot study were maintained to avoid changes in the meaning of constructs and potential compromise on validity.

3.7. 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) recommend 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 becomes 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 becomes 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.

4. Results

4.1. Response rate and sample characteristics

The results indicated that 100% 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% of poor households were headed by men, while 36% by women. Furthermore, the results also showed that 37% of the respondents were in the 26–33 age bracket, while 26% were in the 34–41 age bracket. The findings also revealed that 23% were in the 42–49 age bracket, and 9% were in 18–25 age bracket with only 5% in 50+ age bracket. More so, the results indicated that 54% of poor households used firewood as their main source of cooking fuel, while 45% used charcoal. The results also showed that 0.5% 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% of the households’ heads who responded in the study were able to read and write, while 40% could not read and write. The results are indicated in Table 1.

Table 1. Sample characteristics of respondents

	Frequency	%	Cumulative %
<i>Gender</i>			
Male	256	64	64
Female	144	36	100
Total	400	100	
<i>Age</i>			
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	
<i>Cooking fuel</i>			
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	
<i>Ability to read & write</i>			
Yes	240	60	60
No	160	40	100
Total	400	100	

4.2. 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 0.915, 0.942 and 0.945, which explained 39% of the variance, while three other items of quality-assurance loaded on factor 2, with significant loadings of 0.806, 0.807 and 0.878, which explained 18% of the variance, and three more items of quality-reliability loaded on factor 3 with significant loadings of 0.743, 0.792 and 0.840, which explained 11% of the variance. Besides, three other items of quality-responsiveness loaded on factor 4 with significant loadings of 0.702, 0.885 and 0.893, 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 0.50 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 0.790, 0.849 and 0.881, which explained 63% of the variance, and four other items of interactions loaded well on factor 2 with significant loadings of 0.721, 0.732, 0.830 and 0.848, which accounted for 15% of the variance. Finally, two other items of interdependence loaded well on factor 3 with significant loadings of 0.708 and 0.715, which accounted for 8% of the variance.

Finally, the results indicated that three items of quality loaded on factor 1 with significant loadings of 0.804, 0.807 and 0.837, which explained 65% of the variance. In addition, three other items of welfare loaded on factor 2, with significant loadings of 0.682, 0.813 and 0.848, which explained 9% of the variance, while two other items of access loaded on factor 3 with significant loadings of 0.821 and 0.851, which explained 8% of the variance. Further, two more items of usage significantly loaded on factor 4 with significant loadings of 0.811 and 0.820, which explained 6% of the variance. Therefore, overall, the four factors of financial inclusion accounted for 88% of the total variance.

4.3. 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 to hypothesis (H3) of the study. This finding is in line with Chandan and 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 hazard 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 are 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 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.

Table 2. Pearson’s correlation results

	N	Mean	Std. dev	1	2	3
Financial intermediation (1)	400	3.55	0.556	1.000		
Social networks (2)	400	3.79	0.554	0.175**	1.000	
Financial inclusion (3)	400	3.66	0.496	0.439**	0.461**	1.000

Note: n = 400.

**Correlation is significant at the 0.01 level (2-tailed).

4.4. 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 and 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 and 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. The test results are shown in Figure 1.

The findings from the hierarchical regression analysis in Table 3 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 ($\beta = 0.439$, $p < 0.01$).

Figure 1. Conceptual model for the study.

Source: Developed by Authors.

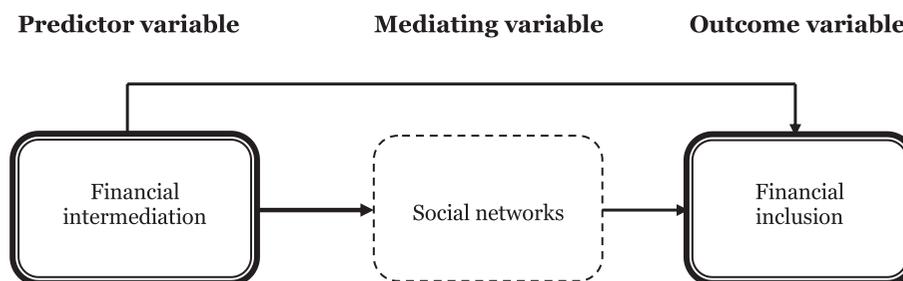


Table 3. Hierarchical regression analysis for the variables

Variables	Dependent variable: financial inclusion			VIF
	Model 1	Model 2	Model 3	
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	

Note: n = 400.

*p < 0.05.

**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 an indication that partial type of mediation exist (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.

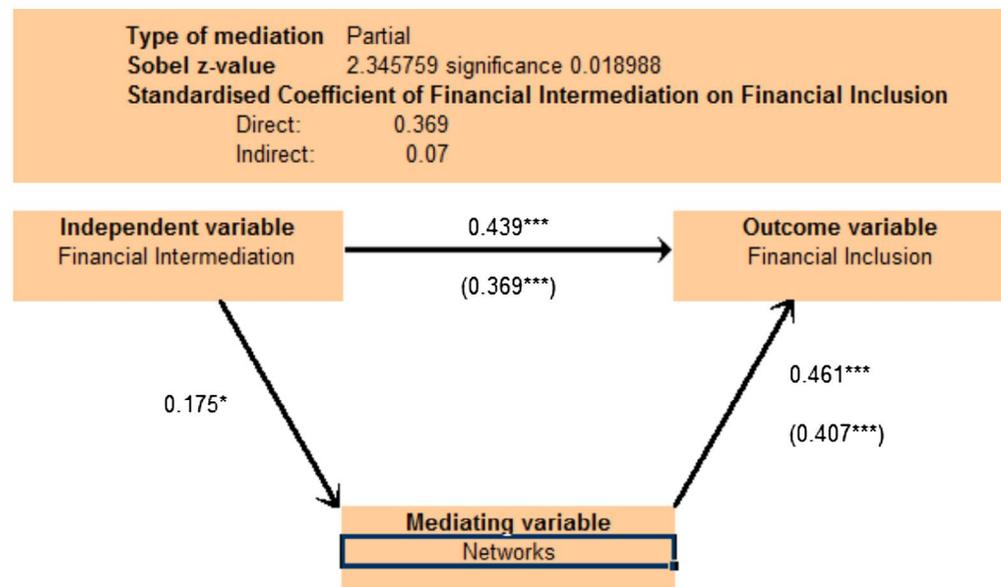
Similarly, to establish the significance of the mediation effect and nature of mediation, the coefficients, beta and standard errors of financial intermediation and financial inclusion as being mediated by social networks were determined using MedGraph Excel program.

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 significantly reduced from 0.439 to 0.369 (in models 2 & 3), indicating that when social network is added into model 3, the impact of financial intermediation on financial inclusion is reduced, but remains significant as indicated in Table 3. 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.

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 and 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.

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



5. Discussion and conclusion

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 mediate 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 and Guinnane (2001) who argue that availability of information through social networks help solve the problem related to providing loans to poor households and it enhances their capacity to access credit from financial intermediaries such as banks. Furthermore, de Aghion and 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 and 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 (Boyd & Prescott, 1986; Ramakrishnan & Thakor, 1984). 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 help in solving the problem of information asymmetry (Akerlof, 1970), which is rampant in financial markets. 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 and Klapper (2012), Sarma (2010), Kendall et al. (2010), Thorat (2007), World Bank (2014), United Nations (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 et al. (2002) suggest that in accessing financial services, social networks help poor households by supplying information and it acts as a mechanism for enforcement. Grootaert and Bastelaer (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 increase 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) also 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 and 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 (Banerjee et al., 1994; Stiglitz, 1990; Wydick, 2001). 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 to hypothesis (H4) of the study, which stated that there is a significant relationship between social networks and financial inclusion in rural Uganda.

5.1. Research implications

The findings suggest that for better understanding, it's always necessary to interpret 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 mediate 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.

5.2. 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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Author details

George Okello Candiya Bongomin¹

E-mail: abaikol3@yahoo.co.uk

Joseph Mpeera Ntayi²

E-mail: ntayius@gmail.com

John C. Munene¹

E-mail: kigozimunene@gmail.com

Charles Malinga Akol³

E-mail: camalinga@gmail.com

¹ Department of FGSR, Makerere University Business School (MUBS), Kampala, Uganda.

² Department of Procurement and Logistics Management, Makerere University Business School (MUBS), Kampala, Uganda.

³ Department of Finance, Makerere University Business School (MUBS), Kampala, Uganda.

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