Analyzing the relationship between financial literacy and financial inclusion by microfinance banks in developing countries: social network theoretical approach

Received 29 December 2019
Revised 13 February 2020
Accepted 13 February 2020

George Okello Candiya Bongomin, Joseph Mpeera Ntayi and Charles Akol Malinga
Makerere University Business School, Kampala, Uganda

Abstract

Purpose – The main purpose of this study is to establish the mediating effect of social network in the relationship between financial literacy and financial inclusion of the poor by microfinance banks in developing countries.

Design/methodology/approach – The study adopted a cross-sectional research design and data were collected from the poor who resides in rural Uganda. Structural equation modelling (SEM) through analysis of moment structures (AMOS) was used to analyze the data. Bootstrap approach with 5,000 samples was run to establish the mediating effect of social network in the relationship between financial literacy and financial inclusion of the poor by microfinance banks in developing countries.

Findings – The results showed that social network significantly and positively mediate the relationship between financial literacy and financial inclusion of the poor by microfinance banks in developing countries. In addition, financial literacy also has a direct significant and positive effect on financial inclusion. Overall, the findings suggest that the presence of social network fully mediate the effect of financial literacy on financial inclusion of the poor by microfinance banks in developing countries.

Research limitations/implications – This study adopted a cross-sectional research design and data were collected using a semi-structured questionnaire. Future studies could adopt longitudinal research design to establish the dynamic characteristics of the samples under study over time. Besides, this study collected data from only poor households who were clients of microfinance banks located in rural Uganda. It ignored the other section of the population who were not the poor. Therefore, future studies could use the other section of the population who are clients of commercial banks.

Practical implications – The advocates of financial literacy and managers of microfinance banks in developing countries should ensure using existing local structures such as community and village associations to conduct financial literacy training. The village associations help in mobilizing members who are close-knit based on the existing societal ties that can be used as a channel for disseminating vital financial literacy information. Indeed, financial literacy workshops, seminars, and business clinics can be easily conducted to individuals who are members of the village associations.

Originality/value – This paper integrates social network theory in the relationship between financial literacy and financial inclusion of the poor by microfinance banks in developing countries. Social network acts as a conduit through which financial knowledge and skills flow to increase the scope of financial inclusion of the poor in developing countries.

Keywords Social network theory, Financial inclusion, Financial education, Rural poor households, Rural Uganda, Microfinance banks

Paper type Research paper

Funding and Acknowledgments: This study received no funding from any source. It was purely self-funded by the Corresponding Author.

International Journal of Sociology and Social Policy

0144-333X
DOI 10.1108/IJSSP-12-2019-0262

1. Background

There is increasing evidence that social network among actors within a social structure can lead to economic growth. This is supported by the seminal work of Granovetter (1973) on the importance of strength of weak ties for information sharing in the job market. Milroy (1980) also asserts that social network grounded on informal social relationships contracted by individuals with ego who are linked to each other, results into social interaction and flow of information. Recently, Okello *et al.* (2018) found that information diffusion through existing ties and interaction significantly increased the level of financial inclusion of the poor in rural Uganda. Social interaction among individuals emanating from social network give rise to trust, capacity for collective action, and information exchange that are beneficial to all members within the social network.

Wasserman and Faust (1994) define social network as social structures made up of a set of actors (such as individuals or organizations) and the dyadic ties between these actors. According to Rangarajan Committee (2008), financial inclusion is a process of ensuring access to financial services and timely and adequate credit where needed by vulnerable groups such as the poor at an affordable cost. While the Organization for Economic Corporation and Development (OECD, 2013a,b,c) refers to financial literacy as the process by which financially illiterate individuals improve their understanding of financial products, concepts, and risks through information acquisition to make informed choices, to know where to go for help, and to take effective actions to improve their financial well-being.

Lusardi *et al.* (2017) suggest that financial literacy helps in empowering and educating the poor so that they are knowledgeable and capable of evaluating different financial products and services in order to make informed decisions so as to derive maximum utility. Financial literacy enables the poor to evaluate complex financial products so that they are aware before making a decision to consume it.

Nevertheless, while financial literacy has been instrumental in creating high sense of awareness among individuals on financial issues, especially in developing countries, the OECD (2016) reveals that the level of financial literacy remains low. This is due to the limited channels through which financial literacy can be delivered.

Balatti and Falk (2002) observe that financial skills and knowledge can be brought into socioeconomic circulation through social network among individuals. Coleman (1994) contends that social network, which inheres in relations and community social organizations are useful for cognitive development through information and knowledge transfer. Social network acts as a conduit through which resources such as ideas, knowledge, and information flow among individuals. The nodes and ties that are part of the social network can promote access to useful financial information and ideas among the actors within the network.

Accordingly, Burt (2004), Strang and Tuma (1993), and Rogers (1995) suggest that the poor people who are similarly positioned in the flow of information within their social network, share common financial information through social influence and contagion. Balatti (2006) contends that social network among individuals facilitate access to scarce resources such as financial knowledge and skills.

Similarly, Stack (2008) states that most financial literacy drives take place within existing social network through which financial knowledge and skills acquired are turn into tangible financial decisions. Indeed, Reagans and McEvily (2003) argue that social network acts as a conduit through which financial knowledge and skills can be transferred to the poor who are members of a particular social group. Therefore, the poor who are in associational network may improve their financial knowledge and skills that enable them to make wise financial decisions and choices (see for e.g. Cohen and Nelson, 2011).

However, while studies such as Lusardi *et al.* (2017), Atkinson and Messy (2012), OECD (2013a,b,c), Lusardi and Tufano (2008), Kempson (2009), and OECD (2009a,b,c,d) have linked

financial literacy to financial inclusion, there are scanty empirical studies, which examines the mediating effect of social network in the relationship between financial literacy and financial inclusion of the poor, especially in developing countries like Uganda. Contextually, although financial literacy has been conducted among the rural communities including the youths in schools, the level of financial literacy still remains low with majority of the rural population unable to compute interest rates (Financial Sector Deepening Uganda, 2016). This current study is motivated by the low level of financial literacy and financial inclusion worldwide, especially in developing countries like Uganda.

Thus, the main purpose of this study is to establish the mediating effect of social network in the relationship between financial literacy and financial inclusion of the poor by microfinance banks in developing countries. The existence of social network in rural areas, especially in developing countries act as a conduit through which financial knowledge and skills flow to help the poor make better financial decisions and choices. This study is guided by the conceptual model in Figure 1.

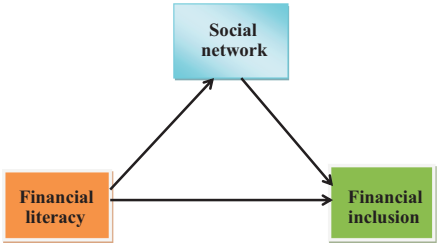
2. Literature review and hypotheses

2.1 Social network theoretical perspective

The network theorists posit that node centrality, density, robustness, and transitivity (structuralist paradigm, see e.g. Blau, 1977; Mayhew, 1980; Wellman, 1988; Brass and Burkhardt, 1993; Powell *et al.*, 1996; Bavelas, 1950; Shaw, 1971) , which enhances tie strength and level of interaction between actors, affect the degree of information flow and sharing (Katz *et al.*, 2005; Granovetter, 2004). Network emphasizes dyadic relations and interdependence that lead to flow of resources including knowledge and ideas among actors in social structures (Gretzel, 2001; Wasserman and Faust, 1994). Balatti *et al.* (2006) observe that the knowledge and skills, values, attitudes and beliefs individuals have about money, the identities constructed about themselves with respect to money, and confidence to act in particular ways with money are all strongly influenced by their network. Indeed, network acts as a conduit for knowledge transfer (Reagans and McEvily, 2003; Granovetter, 1973; Burt, 1992).

2.2 Financial literacy and financial inclusion

According to Anthes and Most (2000), there is a growing need in society today, especially in developing countries for people to be financially literate based on the alarming increase on bankruptcy rates, high consumer debt levels, and low savings rate. Agarwal (2007) observes that lack of awareness and understanding of complex financial products caused by ignorance and low level of financial literacy have resulted into financial exclusion, especially among the unbanked population in rural areas. Cole *et al.* (2010) contend that individuals who are not familiar and comfortable with certain financial products may involuntarily exclude themselves from use of such products. For example, Babych *et al.* (2018) using a sample of



Source(s): Developed by Authors

Figure 1.
Proposed conceptual model for the study

1,000 persons to assess knowledge about simple and compounded interest rate, inflation, financial risks, and effective interest rates in Georgia found that only 5.8% answered all the four questions correctly while 42% fell in the moderate range (two or three correct answers), and the remaining 52% exhibited low levels of financial literacy (one or no correct answers). The findings revealed strong regional disparities in financial literacy and access to finance between the capital city and rural areas.

Consequently, the OECD (2009a,b,c,d) argues that financial literacy is relevant for such individuals, especially the poor who operate at the margin and are vulnerable to persistent downward financial pressure, which excludes them from access to and use of financial services. Additionally, Braunstein and Welch (2002) assert that financial literacy can offer a better understanding of the mainstream financial services and, thus, encourages the unbanked such as the poor to avoid non-standard financial services.

Indeed, Lusardi *et al.* (2017) observe that financial literacy helps the poor by empowering and educating them so that they are knowledgeable about finance in a way that is relevant to their lives. The financial knowledge and skills acquired through financial literacy helps the poor to evaluate complex financial products and services in order to make informed decisions so as to derive maximum utility from these products (see also Greenspan, 2002).

A study by Carpena *et al.* (2011) on the impact of financial literacy on distinct dimensions of financial knowledge found that financial literacy significantly improved basic awareness among individuals toward making sound financial decisions and choices. Besides, Supanantaroek (2013) revealed that financial literacy had a positive and significant impact on savings and spending behaviours among primary school pupils in Uganda (see also Jamison *et al.*, 2014). Grohmann *et al.* (2018) using a cross-country level data also showed that a higher degree of financial literacy strengthens financial depth across income levels and several sub-groups within countries. Therefore, it's worthwhile noting that financial literacy facilitates the decision-making processes, which improves the saving rates and credit worthiness among the poor in order to move them out of poverty. Thus, we hypothesize that:

H1. There is a significant and positive relationship between financial literacy and financial inclusion of the poor by microfinance banks in developing countries.

2.3 Social network and financial inclusion

Granovetter (1973) observes that nodes and ties, which are parts of network, can promote access to better information and ideas about existing opportunities and scarce resources. Woolcock (1999) suggests that network generates information channels, facilitate transactions, and reduces cost in accessing financial services such as credit. Social network acts as a conduit for transfer of information about existing sources of financial services among the poor (Grootaert, 2001).

Accordingly, Okten and Osili (2004) contend that social network leads to sharing of information about availability of credit opportunities. Similarly, social network among the poor acts as a screening device to determine their creditworthiness and being selected to receive loans (Aryeetey, 2005; Grootaert, 1999).

Previous studies by Karlan (2007) and Ahlin and Townsend (2007) found that social network among the poor was essential tool for recommending members and ensuring that repayment contract was enforced. Indeed, when extending credit, lenders are always concerned with moral hazard (Stiglitz and Weiss, 1981). Therefore, social ties and its resulting potential for sanction helps to mitigate the problems of adverse selection and moral hazard among the poor (Floro and Yotopolous, 1991). Hence, we hypothesize that:

H2. There is a significant and positive relationship between social network and financial inclusion of the poor by microfinance banks in developing countries.

2.4 Financial literacy and social network

It's worth noting that since financial literacy entails knowledge and skills acquisition, financial literacy programmes among the poor may occur within social network. The World Bank (2009) argues that most individuals, especially the poor who live in developing countries, rely more on their informal networks to carry out activities that are beneficial to all who are part of such networks. Besides, the strength of an interpersonal connection can affect how easily knowledge is transferred (Uzzi, 1997; Hansen, 1999).

Stack (2008) elucidates that most financial literacy programmes, especially in developing countries entail interactive learning within social network. Accordingly, Balatti (2006) stipulates that networks embedded in social capital of relationships among the poor, facilitate access to resources such as financial knowledge and skills. The individuals in social network who communicates with each other frequently or who have strong emotional attachments are more likely to share financial knowledge than those who communicates infrequently or who are not emotionally attached (Uzzi, 1997).

Cohen and Nelson (2011) revealed that poor households in associational networks improved their financial knowledge and skills, which enabled them to make wise financial decisions and choices. The existing social network acted as a conduit for sharing financial knowledge and information (Reagans and McEvily, 2003). Thus, here we hypothesize that:

H3. There is a significant and positive relationship between financial literacy and social network among the poor in developing countries.

2.5 Social network: mediator between financial literacy and financial inclusion

Balatti (2007) observes that financial literacy is done within networks and is dependent at least in part on having or attaining access to particular kinds of networks. The nature of the co-operation within a network shows how its members function together, depends on its common purpose, the resources it has at its disposal, and the norms and values that shape the interaction. Social network can facilitate access to other resources by individuals or groups for a specific purpose (Balatti, 2006). Thus, the resources that are available within a network are clearly a function of the resources that its members bring to it. These resources may include knowledge, skills, financial and physical resources, and contacts with other networks.

Similarly, Krackhardt (1990) and McEvily *et al.* (2003) state that after financial literacy programmes, the poor may change their networks with which they interact, and they may also change their interaction in their existing networks. Additionally, they may deploy the new knowledge and identity resources in interaction, which are different from those in the past by moving away from the old networks to new ones. This leads to creation of dense networks through which tacit and codified knowledge and information such as financial knowledge can flow and shared by the poor.

Drawing from the work of Burt (1992) on structural holes, individuals on opposite ends of a structural hole can have access to distinct knowledge and information. Conversely, a strong tie across a structural hole can ease knowledge transfer across a structural hole (See also Hansen, 2002). This may result into flow of financial knowledge and skills.

Falk and Kilpatrick (2000) also suggest that a member in the network who is financially literate may increase the knowledge and skills of the other members if shared. Therefore, the knowledge and skills, values, attitudes and the beliefs about money, the identities constructed with respect to money, and confidence to act in particular ways with money, are all strongly influenced by social networks to which individuals such as the poor belong and to which they have access (see for e.g. Balatti *et al.*, 2006). Thus, here we hypothesize that:

H4. Social network significantly and positively mediate the relationship between financial literacy and financial inclusion of the poor by microfinance banks in developing countries.

3. Methodology and data approach

3.1 Research design and procedure

The study applied a cross-sectional research design and data were collected using a semi-structured questionnaire. The cross-sectional research design was used because of its ability to collect large amount of data over a shorter period of time. Besides, the design has the strength of eliminating re-current mistakes in the study questionnaire that is common with longitudinal research design. Furthermore, the study was also descriptive in nature and quantitative data were collected from a total sample of 400 poor households located in rural Uganda to establish the mediating effect of social network in the relationship between financial literacy and financial inclusion of the poor by microfinance banks in developing countries.

3.2 Population and sample size

The population for this study consisted of 1.2 million poor households living in the four regions of northern, eastern, central, and western Uganda. The population for the study was drawn specifically from poor households living along the digital banking map according to FinScope survey (2010). The poor households were chosen for this study because they have been largely excluded from access to and use of basic financial services provided by formal financial institutions. Financial Sector Deepening Uganda (2016) contends that most banks are located in the urban areas with only 14% presence in rural Uganda to serve the poor. Therefore, from a total population of 1.2 million poor households, a sample of 400 poor households was selected for this study. The samples were obtained using formulae for sample size determination recommended by Yamane (1973). The unit of analysis were the poor households and the unit of inquiries were the poor households' heads. Thus, for the purpose of this study, data were collected from a total sample of 400 poor households located in rural Uganda.

3.3 Sampling design and procedures

Simple random sampling was used to select a total of 400 poor households for this study. Simple random sampling design was used because it gives the entire samples the chances of being included in the study. The poor households were randomly identified based on three criteria of poverty indicators of households' utilities, housing conditions, and households' welfare as recommended by Uganda Bureau of Statistics (UBOS, 2012). The criteria were repeatedly used until a total sample of 400 poor households was arrived at for this study. Overall, 400 poor households' heads selected from the four regions of northern, eastern, central, and western Uganda were used in this study.

3.4 Measures of study variables

The main purpose of this study is to establish the mediating effect of social network in the relationship between financial literacy and financial inclusion of the poor by microfinance banks in developing countries. Therefore, financial literacy, financial inclusion, and social network were the key variables under this study.

Financial literacy was measured using the dimensions of behaviour, skills, knowledge, and attitude as adopted from previous scholars such as Atkinson and Messy (2012), Lusardi and Mitchell (2009), Lusardi and Tufano (2009a,b), Lusardi (2003), Kempson (2009). These measures were found to be valid and reliable in previous studies. Thus, the measurement

items generated under each of the constructs were anchored onto a five-point Likert scale starting from strongly agree (5), agree (4), not sure (3), disagree (2) and strongly disagree (1) in order to elicit the expected responses from the respondents. Furthermore, reliability and validity tests were also carried out on these items. The results revealed that all the items were above the cut-off points recommended by Nunnally and Bernstein (1994), Sekaran (2003) and Amin (2005). The items had alpha coefficient (α) = 0.922 and validity (total variance explained) = 89%.

Financial inclusion was measured using the dimensions of access, quality, usage, and welfare impact as adopted from ACCION (2011), Alliance for Financial Inclusion (2011), Cihák *et al.* (2012), and Claessens (2006). The measurement scales were developed to suit the study context based on scales developed by Ardic *et al.* (2011), Kendall *et al.* (2010), Beck *et al.* (2008), and the Maya Declaration of the key pillars of financial inclusion in developing countries. The items in the questionnaire 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 were tested for reliability and validity and the results indicated that the items had (α) = 0.938 and validity (total variance explained) = 88%.

Social network was measured using the constructs of interaction, interdependence, and ties as adopted from previous studies. The items used to measure social network were adopted from previous scholarly works by Katz *et al.* (2005), Granovetter (2004), Heikkilä *et al.* (2009), Okten and Osili (2004), Ahlin and Townsend (2007), and Godquin and Quisumbing (2005). The measurement items for social network were anchored onto a five-point Likert scale of strongly agree (5), agree (4), not sure (3), disagree (2) and strongly disagree (1), and tested for reliability and validity. The results showed that α = 0.925 and validity (total variance explained) = 85% all above the cut-off points.

3.5 Data collection

The study used a semi-structured questionnaire to elicit responses from the respondents who were poor households' heads. The measurement items in the questionnaire were developed from previous Journal referenced studies. Prior to the major study, the questionnaire was piloted on 200 samples. Tests for validity and reliability were performed on the items and the results indicated that all the items were valid and reliable. Besides, exploratory factor analysis was performed on the items to further refine the instrument to be used in the final study. In addition, all vague concepts, double barrel questions, and hard questions were also removed from the final questionnaire to keep it simple, specific, and concise (see for e.g. Tourangeau *et al.*, 2000).

The questionnaires were directly administered to the respondents by research assistants. The research assistants were recruited from the four regions in Uganda that were selected for the study. This was to solve the problem of non-responses arising from language barrier. Data were collected over a period of 3 months from March to June 2015 from the four regions by four research assistants.

3.6 Data management

The data received from the field were sorted, coded, and entered into SPSS statistical analysis software and checks for data entry errors, missing values, outliers, and normality were performed. Frequencies and descriptive statistics were generated to check for data entry errors and missing values. Little's MCAR test was performed to check for the extent and pattern of missing values in the data. The results indicated that there were minimal data entry errors and the data were missing completely at random with Little's MCAR test significant at p-value less than 5%, which was acceptable for replacement (Field, 2005). The missing values in the data were replaced using linear interpolation. However, the results showed that no outliers were present in the data. Furthermore, test for assumption of parametric data was

also performed on the data. The histogram, normal p-p plots, and multi-collinearity were used to check whether the data were normally distributed while the Levene's test was carried out to check for homogeneity of variances in the data.

The results revealed that the histogram was bell-shaped indicating that the data met the assumption of normality. Additionally, the results indicated that all the dots on the normal p-p plots were falling along the straight line, showing that the data were normally distributed. Besides, the results revealed that multi-collinearity was not a problem in the data since the tolerance value (>0.2) and Variance Inflation Factors (<10) were achieved and tenable as recommended by Field (2005) and Hair *et al.* (2010). In addition, the Levene's test to check for homogeneity of variance was also non–significant at $P > 0.05$, indicating that the variances were stable at all levels. Thus, all tests performed to check for normality in the data confirmed that assumption of parametric data was achieved and tenable and the data were good enough for further statistical analysis.

3.7 Establishing the mediation effect

The mediation effect exist when the impact of a predictor variable cause an effect on an outcome variable through a mediator. The degree to which the direct effect changes as a result of including the mediating variable is referred to as the mediation effect as indicated in Figure 1.

Therefore, two methods have been recommended and used in previous studies to establish the mediation effect of a third variable in a relationship. The Sobel's *z* test and MedGraph Excel programme have been used as recommended by Baron and Kenny (1986) and Jose (2008). While the structural equation modelling (SEM) through Bootstrap approach also exist to test for the mediation effect as recommended by Hair *et al.* (2010).

Thus, for the purpose of this study, SEM Bootstrap approach through AMOS was adopted to establish the mediating effect of social network in the relationship between financial literacy and financial inclusion of the poor by microfinance banks in developing countries. The SEM Bootstrap approach was used because of its superiority over the Sobel's *z* test and MedGraph Excel programme. Firstly, SEM helps the researcher to build complex relationships between several variables. Secondly, SEM provides bootstrap confidence intervals and associated statistical significance tests for indirect effects, particularly when assumptions of normality are violated.

Therefore, in order to establish the mediating effect of social network in the relationship between financial literacy and financial inclusion of the poor by microfinance banks using the SEM Bootstrap approach, two models, i.e. the measurement and the structural models were constructed as recommended by Preacher and Hayes (2008) and Hair *et al.* (2010). The measurement model was constructed through confirmatory factor analysis (CFA) to test whether the underlying manifest variables are linked to their latent factors based on a sound theoretical foundation (Hair *et al.*, 2010). Similarly, the structural model was constructed to relate all of the variables (both latent and manifest) in one complex model.

Hair *et al.* (2010) suggest that the goodness-of-fit (GOF) indices should be used to determine how well the observed data actually fit to the measurement model and structural model. The goodness-of-fit indices are the measures indicating how well a specified model reproduces the covariance matrix among the indicator variables. Hair *et al.* (2010) advocate for the use of three to four fit indices in order to establish adequate evidence of model fit. Thus, for the purpose of this study, the chi-square (x^2) together with the degrees of freedom and probability, the incremental fit index (IFI), the Tucker Lewis index (TLI), the comparative fit index (CFI), and the Root Mean Square Error of Approximation (RMSEA) were used to explain how the observed data fitted well to the models.

Additionally, Hair *et al.* (2010) argue that when examining the mediation effect, two competing models should be constructed also for comparison purpose to determine the direct

and indirect effect of the independent variable on the dependent variable. They suggest that the mediating model with both direct and indirect effects should have better GOF than the non-mediated model. Similarly, Hayes and Preacher (2010) recommend that for full mediation to exist, the p-value should be significant at $p < 0.05$ in the SEM mediated model.

Consequently, AMOS software was used to construct the measurement and structural models under this study. Bootstrapping was performed at 95 percentile level of confidence with bootstrap set at 5,000 samples to establish the mediating effect of social network in the relationship between financial literacy and financial inclusion of the poor by microfinance banks in developing countries.

4. Findings

4.1 Sample characteristics

The findings indicated that all the targeted 400 poor households participated in the study, thus, yielding 100% response rate. The response rate of 100% was achieved because data were collected by research assistants who were recruited from the particular regions selected for the study. This solved the problem of non-responses that could have resulted from language barrier and lack of time among the respondents. Besides, the findings revealed that 64% of the poor households were headed by male while 36% by female. Furthermore, the findings also indicated that 37% of the respondents were in the 26–33 age bracket while 26% were in the 34–41 age bracket. In addition, the findings also indicated 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 findings also showed that 60% of the households' heads who responded in the study were able to read and write while 40% were not able to read and write. This means that most poor households are headed by individuals who can read and write (see Table 1).

The main purpose of this study is to establish the mediating effect of social network in the relationship between financial literacy and financial inclusion of the poor by microfinance banks in developing countries. Thus, in order to establish the mediating effect, Baron and Kenny (1986) suggest that relationships should exist between the independent, mediator, and dependent variables as indicated in Figure 1. Firstly, a relationship should exist between the independent variable and dependent variable. Secondly, there should be a relationship between the mediator variable and dependent variable. Thirdly, the independent variable and mediator variable should be related. Lastly, a relationship should exist between the independent, mediator, and dependent variables.

Characteristics	Frequency	%	Cumulative %
Gender			
Male	254	64.0	64.0
Female	146	36.0	100.0
Total	400	100.0	
Age			
18–25 years	38	9.0	9.0
26–33 years	147	37.0	46.0
34–41 years	102	26.0	72.0
42–49 years	92	23.0	95.0
50+ years	21	5.0	100.0
Total	400	100.0	
Ability to read and write			
Yes	240	60.0	60.0
No	160	40.0	100.0
Total	400	100.0	

Table 1.
Sample characteristics

Thus, Pearson correlation analysis was performed to test for the existence of relationships between financial literacy, social network, and financial inclusion. The results of the zero order correlations are indicated in Table 2.

The correlation results indicated that there is a significant and positive relationship between financial literacy and financial inclusion ($r = 0.297$, p-value ≤ 0.01). This confirms hypothesis (H1), which states that there is a significant and positive relationship between financial literacy and financial inclusion of the poor. According to OECD (2009a,b,c,d), financial literacy is relevant for the poor who operate at the margin and are vulnerable to persistent downward financial pressure. Additionally, Braunstein and Welch (2002) contend that financial literacy can offer a better understanding of mainstream financial services and, thus, encourages the unbanked to avoid non-standard financial services. Lusardi (2008) also argues that financial literacy helps the poor by empowering and educating them so that they are knowledgeable about finance in a way that is relevant to their lives. The financial knowledge and skills acquired through financial literacy helps the poor to evaluate financial products and services in order to make informed decision so as to derive maximum utility from these products (see also Greenspan, 2002).

Furthermore, the correlation results also revealed that social network and financial inclusion are significantly and positively related ($r = 0.461$, p-value ≤ 0.01), therefore, lending support to hypothesis (H2), which states that there is a significant and positive relationship between social network and financial inclusion of the poor. Indeed, network acts as a conduit for transfer of information about existing sources of financial services among the poor (Grootaert, 2001). Okten and Osili (2004) contend that social network leads to sharing of information about availability of credit opportunities. Besides, social network among the poor acts as a screening device to determine the creditworthiness of the borrowers and selections of clients who are potential borrowers in loan granting process (Grootaert, 1999). Thus, social ties and its resulting potential for sanction helps to mitigate the problems of adverse selection and moral hazard rampant in joint liability lending contracts, especially among the poor (Floro and Yotopolous, 1991).

Similarly, the findings showed that there is a significant and positive relationship between financial literacy and social network ($r = 0.253$, p-value ≤ 0.01). The World Bank (2009) argues that most individuals, especially the poor who live in developing countries, rely more on their informal networks for carrying out activities that are beneficial to all who are part of such networks. Consistently, Stack (2008) elucidates that most financial literacy programmes, especially in developing countries, entail interactive learning within social networks. Balatti (2006) stipulates that networks embedded in social capital of relationships among the poor facilitates access to resources such as knowledge and skills. This finding lends support to hypothesis (H3), which states that there is a significant and positive relationship between financial literacy and social network among the poor.

4.2 Mediation effect

The SEM Bootstrap approach through AMOS was applied to establish the mediating effect of social network in the relationship between financial literacy and financial inclusion of the poor by microfinance banks in developing countries.

Table 2. Pearson's Zero order correlations for the variables

Variables	N	Mean	S.D	1	2	3
Financial literacy (1)	400	3.61	0.489	1		
Social network (2)	400	3.79	0.554	0.253**	1	
Financial inclusion (3)	400	3.70	0.496	0.297**	0.461**	1

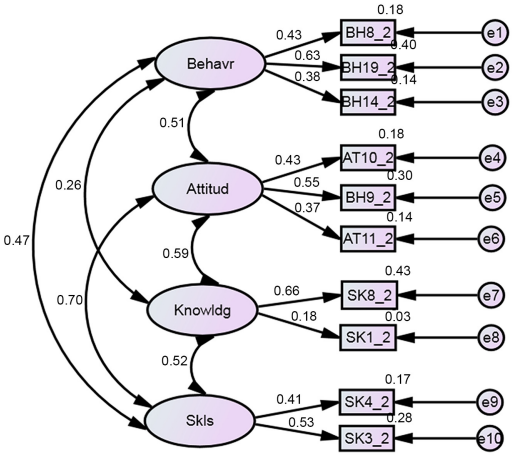
Note(s): **p-value < 0.01 (two tailed)

The findings indicated that the standardized parameter estimates of the initial measurement model for financial literacy latent and its manifest were all significant ($p < 0.001$) and the model provided a good model fit statistics for the construct measures with chi-square (x^2) of 30.073 (degrees of freedom = 29, probability level = 0.410), Incremental Fit index (IFI) of 0.991 over the recommended 0.95, Tucker Lewis index (TLI) of 0.984 above the recommended 0.95, Comparative Fit index (CFI) of 0.989 above the recommended 0.90, and the Root Mean Square Error of Approximation (RMSEA) of 0.014 below the recommended cut-off point of 0.08. This is indicated in Figure 2.

More so, the findings also revealed that the measurement model for social network latent and its manifest fitted well to the observed data with excellent goodness-fit indices of chi-square (x^2) = 11.068 (degrees of freedom = 24, probability level = 0.989), Incremental Fit index (IFI) = 1.079, Tucker Lewis index (TLI) = 1.128, Comparative Fit index (CFI) = 1.000, and the Root Mean Square Error of Approximation (RMSEA) = 0.000. This is indicated in Figure 3.

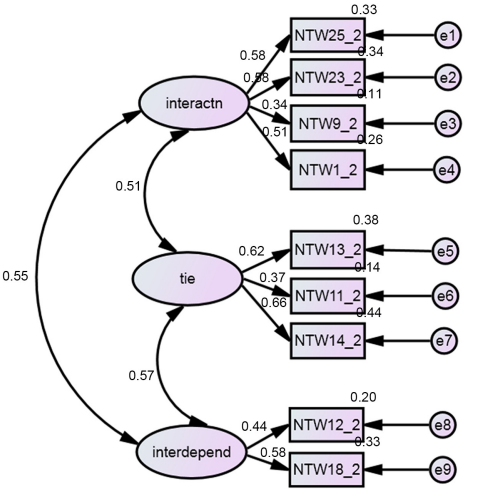
Finally, the initial measurement model for financial inclusion latent and its manifest were all significant ($p < 0.001$) and the model provided an excellent goodness-fit statistics for the construct measures. The chi-square (x^2) was 25.133 with degrees of freedom of 29 and probability level of 0.671. The Incremental Fit index (IFI) was 1.019 further above the recommended 0.95, while the Tucker Lewis index (TLI) was 1.031 further above the threshold cut-off points of 0.95, and the Comparative Fit index (CFI) was 1.000 over the recommended 0.90 with the Root Mean Square Error of Approximation (RMSEA) of 0.000. This is shown in Figure 4.

Thereafter, a structural model combining all the variables under study was constructed to establish the mediating effect of social network in the relationship between financial literacy and financial inclusion of the poor by microfinance banks in developing countries. The final structural model was constructed through AMOS Bootstrap to relate the variables of financial literacy, social network and financial inclusion. The findings revealed that social network significantly and positively mediate the relationship between financial literacy and financial inclusion. The mediated structural model was better than the non-mediated model as indicated by GOF with chi-square (x^2) = 12.331 (degrees of freedom = 27; probability



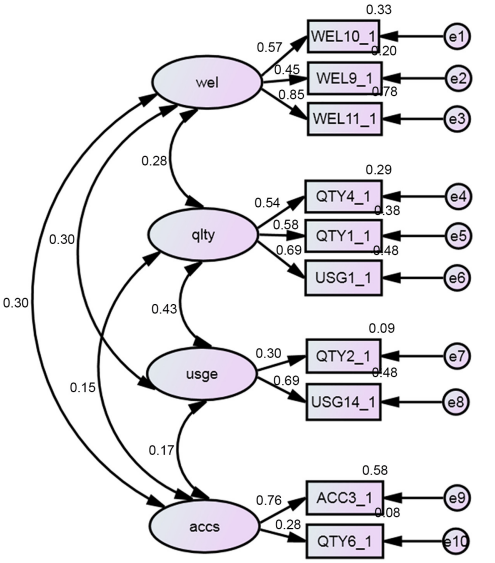
Chi-square = 30.073; Degrees of freedom (Df) = 29; Probability (P) = 0.410
Incremental Fit Index (IFI) = 0.991; Tucker Lewis Index (TLI) = 0.984
Comparative Fit Index (CFI) =0.989; Root Means Square Error of Approximation (RMSEA) =0.014

Figure 2.
Measurement model for financial literacy



Chi-square = 11.068; Degrees of Freedom (Df) = 24; Probability (P) = 0.989
Incremental Fit Index (IFI) = 1.079; Tucker Lewis Index (TLI) = 1.128
Comparative Fit Index (CFI) = 1.000; Root Mean Square Error of Approximation (RMSEA) = 0.000

Figure 3.
Measurement model for social network



Chi-square = 25.133; Degrees of freedom (Df) = 29; Probability (P) = 0.671
Incremental Fit Index (IFI) = 1.019; Tucker Lewis Index (TLI) = 1.031
Comparative Fit Index (CFI) = 1.000; Root Mean Square Error of Approximation (RMSEA) = 0.000

Figure 4.
Measurement model for financial inclusion

level = 0.527). The Incremental Fit index (IFI) = 0.992, Tucker Lewis index (TLI) = 0.991, Comparative Fit index (CFI) = 0.989 and the Root Mean Square Error of Approximation (RMSEA) = 0.010. The results are indicated in Table 3.

The findings indicate the importance of social network as a channel through which financial knowledge and skills flow in order to help the poor to make wise and sound financial decisions and choices. The presence of social network in the relationship boosts the effect of financial literacy on financial inclusion by 10.3% as indicated in Table 4. Overall, a combination of financial literacy and social network explains 20% of the variation in financial inclusion of the poor by microfinance banks in developing countries, especially in Uganda as shown in Figure 5. This finding is in line with Balatti (2007) who observes that financial literacy is done within networks and is dependent at least in part on having or attaining access to particular kinds of networks. Besides, Falk and Kilpatrick (2000) suggest that a member in the network who is financially literate may increase the knowledge and skills of the other members if shared. Balatti *et al.* (2006) contend that the knowledge and skills, values, attitudes, and beliefs about money, the identities constructed with respect to money, and confidence to act in particular ways with money, are all strongly influenced by social network

Variables	Non-mediated model	Mediated model
Social network ← financial literacy	not estimated	0.272***
Fin. inclusion ← financial literacy	0.272***	0.258***
Fin. inclusion ← Social network	0.155***	0.379***
CMIN	15.295	12.331
Degrees of freedom (Df)	31	27
Probability (p)	0.322	0.527
Incremental fit index (IFI)	0.974	0.992
Tucker–Lewis index (TLI)	0.956	0.991
Comparative fit index (CFI)	0.970	0.989
Root mean square error of approximation (RMSEA)	0.038	0.010
Squared multiple correlations		
Fin. inclusion	0.173	0.274
Social network	–	0.199

Note(s): $N = 400$; Significance level: *** $p < 0.0001$; ** $p < 0.001$; * $p < 0.05$

Table 3. SEM competing models for mediation effect of social network

Standardized total effects:	Fin. Lit		Social network		
Social network	0.272***		0.000		
Financial inclusion	0.258***		0.379***		
Standardized direct effects:					
Social network	0.272***		0.000		
Financial inclusion	0.155***		0.379***		
Standardized indirect effects:					
Social network	0.000		0.000		
Financial inclusion	0.103***		0.000		
Bootstrap Mediation Results:	Point Estimates	SE	Lower Bounds	Upper Bounds	P
Financial lit ← Fin. incl	0.117	0.050	0.048	0.199	0.019
Social network ← Fin. incl	0.315	0.055	0.042	0.190	0.000

Note(s): $N = 400$; Significance level: *** $p < 0.0001$; ** $p < 0.001$; * $p < 0.05$

Table 4. Total, direct and indirect effects

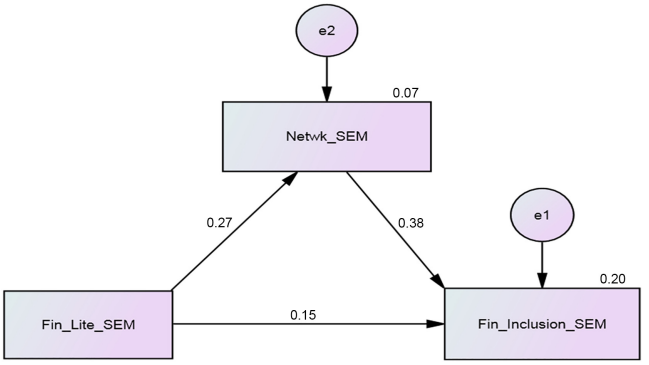


Figure 5.
Structural Equation Model for mediating effect of social network

to which the poor belong and to which they have access. Social network acts as a conduit for information diffusion and transfer of financial knowledge and skills among the poor. This finding is consistent with hypothesis (H4), which posits that social network significantly and positively mediate the relationship between financial literacy and financial inclusion of the poor by microfinance banks in developing countries.

5. Discussions

The main purpose of this study is to establish the mediating effect of social network in the relationship between financial literacy and financial inclusion of the poor by microfinance banks in developing countries. Therefore, the discussion focuses on the hypotheses derived under this study. Four hypotheses were generated under this study and the results are discussed below.

The findings from this study revealed that there is a significant and positive relationship between financial literacy and financial inclusion. This confirms our hypothesis (H1) of this study. Indeed, financial knowledge and skills acquired through financial literacy helps the poor to evaluate complex financial products and services in order to make informed decisions so as to derive maximum utility from these products. Correspondingly, a study by Supanantaroek (2013) indicated that financial literacy had a positive and significant impact on savings and spending behaviours among primary school pupils in Uganda (see also Jamison *et al.*, 2014).

Furthermore, the findings from this study also showed that social network and financial inclusion are significantly and positively related. This is in line with our hypothesis (H2) of this study. Previous studies such as Karlan (2007) and Ahlin and Townsend (2007) found that social network among the poor was essential tool for recommending members and ensuring that repayment contract was enforced. The existing ties help in providing information about the behaviours of the individuals in order to mitigate the problems of adverse selection and moral hazard in lending.

Similarly, the findings indicated that there is a significant and positive relationship between financial literacy and social network. This corresponds to hypothesis (H3) of this study. Stack (2008) observes that most financial literacy programmes, especially in developing countries entail interactive learning within social networks. Thus, networks embedded in social capital of relationships among the poor facilitate access to resources such as financial knowledge and skills, which helps the poor to make wise and sound financial decisions and choices.

In addition, the findings also revealed that social network significantly and positively mediate the relationship between financial literacy and financial inclusion. This corresponds to hypothesis (H4) of this study. This finding supports the argument that financial literacy is done within networks and is dependent at least in part on having or attaining access to particular kinds of networks (Balatti, 2007). Besides, Falk and Kilpatrick (2000) suggest that a member in the network who is financially literate may increase the knowledge and skills of the other members if shared. Therefore, the knowledge and skills, values, attitudes, and beliefs about money, the identities constructed with respect to money and confidence to act in particular ways with money are all strongly influenced by the social networks to which individuals such as the poor belong and to which they have access (Balatti *et al.*, 2006).

6. Conclusions

The main purpose of this study is to establish the mediating effect of social network in the relationship between financial literacy and financial inclusion of the poor by microfinance banks in developing countries.

The findings from this study showed that there is a significant and positive relationship between financial literacy and financial inclusion. This confirms hypothesis (H1), which states that there is a significant and positive relationship between financial literacy and financial inclusion of the poor by microfinance banks in developing countries.

More so, the findings also indicated that social network and financial inclusion are significantly and positively related, therefore, lending support to hypothesis (H2), which states that there is a significant and positive relationship between social network and financial inclusion of the poor by microfinance banks in developing countries.

Besides, the findings revealed that there is a significant and positive relationship between financial literacy and social network. This is consistent with hypothesis (H3), which states that there is a significant and positive relationship between financial literacy and social network among the poor.

Finally, the findings showed that social network significantly and positively mediate the relationship between financial literacy and financial inclusion of the poor by microfinance banks in developing countries. It revealed the importance of social network as a channel through which financial knowledge and skill flow in order to help the poor to make wise and sound financial decisions and choices. The presence of social network in the relationship boosts the effect of financial literacy on financial inclusion by 10.3%. Overall, a combination of financial literacy and social network explains 20% of the variation in financial inclusion of the poor by microfinance banks in developing countries, especially in Uganda. This supports hypothesis (H4) of this study.

7. Policy implications

The advocates of financial literacy and managers of microfinance banks in developing countries should ensure using existing local structures such as community and village associations to conduct financial literacy training. The village associations help in mobilizing members who are close-knit based on the existing societal ties that can be used as a channel for disseminating vital financial literacy information. Indeed, financial literacy training programmes may be delivered through organising workshops, seminars, and business clinics to the selected members of the village associations. Financial literacy modules could be delivered through use of leaflets, handouts, and manuals that are distributed to group members during the training sessions.

Besides, the managers of the microfinance banks in developing countries may use the existing social structures such as community groups to extend financial services to the population. These social structures may help as a conduit through which useful information

may be obtained about the characters and potential of the members to pay back the loans that is borrowed from the microfinance banks.

In addition, the governments and advocates of financial literacy in developing countries may also use the existing social networks to deliver financial literacy campaigns. The existing social networks may be used for mobilizing community members to attend financial literacy trainings and awareness within the given communities. Indeed, the social networks may be used in spreading information about financial literacy drives among members in the communities.

Similarly, clients of the microfinance banks such as the poor should engage in the activities of village associations through which they may access scarce resources like loans. The members in the village associations may act as guarantors to other members due to the strong bond during borrowing from the microfinance banks, which requires physical collateral in the process of lending. This may lead to increased access to financial services such as loans among the rural population like the poor.

Furthermore, the employees of the microfinance banks may also use the existing social structures among the poor as a tool for screening loan applicants in developing countries. The social structures can provide information about the financial behaviours of the different members upon which loan decision is made by the loan officers. In addition, they may also use the existing social structures to teach the borrowers prior to lending in order to enable them use the money for the right purpose.

More so, the donors who are willing to offer small business credit to the poor may also use the existing social structures in the rural areas. These may help during the evaluation process on the economic status and suitability of the beneficiaries whether they qualify for the loans. The social structures may offer information that could help in mapping out the right individuals to benefit from the business loans offered by donors, especially to the poor in the rural areas.

8. Study limitations

This study adopted a cross-sectional research design and data were collected using a semi-structured questionnaire. Future studies could adopt longitudinal research design to establish the dynamic characteristics of the samples under study over time. Besides, this study collected data from only poor households who were clients of microfinance banks located in rural Uganda. It ignored the other section of the population who were not the poor. Therefore, future studies could use the other section of the population who are clients of commercial banks.

References

ACCION (2011), *Center for Financial Inclusion, Financial Inclusion:* What's the Vision? *What Would it Take for Mexico to Achieve Full Inclusion by the Year 2020?*, ACCION International, Washington, DC.

Ahlin, C. and Townsend, R. (2007), "Using repayment data to test across models of joint liability lending", *Economic Journal*, Vol. 117, pp. F11-F51.

Alliance for Financial Inclusion (2011), "Measuring financial inclusion: a core set of indicators", AFI financial inclusion data working group paper, available at: http://www.afiglobal.org.

Agarwal, R. (2007), "100% Financial inclusion: a challenging task ahead", *Jaipuria Institute of Management, Lucknow, Conference on Global Competition & Competitiveness of Indian Corporate*, New Delhi, India.

Amin, M. (2005), *Social Sciences Research Conception, Methodology and Analysis*, Makerere University Printery, Kampala.

Anthes, W.L. and Most, B.W. (2000), "Frozen in the headlights: the dynamics of women and money", *Journal of Financial Planning*, Vol. 13 No. 9, pp. 130-142.

Ardic, O.P., Heimann, M. and Mylenko, N. (2011), "Access to financial services and the financial inclusion agenda around the world", *A Cross-Country Analysis with a New Data Set*, The World Bank Financial and Private Sector Development Consultative Group to Assist the Poor January 2011, WPS5537.

Aryeetey, E. (2005), "Informal finance for private sector development in sub africa", *Journal of Microfinance*, Vol. 7 No. 1, pp. 13-38.

Atkinson, A. and Messy, F. (2012), "Measuring financial literacy: results of the OECD/international network on financial education (INFE) pilot study", *OECD Working Papers on Finance, Insurance and Private Pensions, No. 15*, OECD Publishing, doi: 10.1787/5k9csfs90fr4-en.

Babych, Y., Grigolia, M. and Keshelava, D. (2018), "financial inclusion, financial literacy, and financial education in Georgia", ADBI Working Paper 849, Asian Development Bank Institute, Tokyo, available at: https://www.adb.org/publications/financial-inclusion-financial-literacyand-financial-education-georgia.

Balatti, J. (2007), "Financial literacy and social networks – what's the connection?", *Presentation at the ALA National Conference*, Cairns, November, 2007.

Balatti, J. (2006), "Financial literacy and social networks – what's the connection?", *Presentation at the ALA National Conference, Cairns*.

Balatti, J. and Falk, I. (2002), 'Socioeconomic contributions of adult learning to community: a social capital perspective", *Adult Education Quarterly*, Vol. 52, No.4, pp. 281-298.

Balatti, J., Black, S. and Falk, I. (2006), *Reframing Adult Literacy and Numeracy Course Outcomes: A Social Capital Perspective*, Adelaide, South Australia: National Centre for Vocational Education Research, NCVER SA.

Baron, R.M. and Kenny, D.A. (1986), "The moderator-mediator variable distinction in social psychological research: conceptual, strategic and statistical considerations", *Journal of Personality and Social Psychology*, Vol. 51 No. 6, pp. 1173-1182.

Bavelas, A. (1950), "Communication patterns in task-oriented groups", *Journal of the Acoustical Society of America*, Vol. 22 No. 6, pp. 723-730.

Beck, T., Demirguc-Kunt, A. and Martinez Peria, M.S. (2008), "Banking services for everyone? Barriers to bank access and use around the world", *The World Bank Economic Review*, Vol. 22 No. 3, pp. 397-430.

Blau, P.M. (1977), *Inequality and Heterogeneity*, Free Press, New York, NY.

Brass, D.J. and Burkhardt, M.E. (1993), "Potential power and power use: an investigation of structure and behavior", *Academy of Management Journal*, Vol. 36 No. 3, pp. 441-470.

Braunstein, S. and Welch, C. (2002), "Financial literacy: an overview of practice, research, and policy", *Federal Reserve Bulletin*, Vol. 88, pp. 445-457.

Burt, R. (1992), *Structural Holes: The Social Structure of Competition*, Harvard University Press, Cambridge, MA.

Burt, R. (2004), "Structural holes and good ideas", *American Journal of Sociology*, Vol. 110, No. 2, pp. 349-399.

Carpena, F., Cole, S., Shapiro, J. and Zia, B. (2011), "Unpacking the causal chain of financial literacy: policy research", Working paper 5798/e, World Bank Development Research Group.

Čihák, M., Demirgüç-Kunt, Aslı, Erik, F. and Levine, R. (2012), "Benchmarking financial systems around the world: the world bank policy research", Working Paper 6175.

Claessens, S. (2006), "Access to financial services: a review of the issues and public policy objectives", *Oxford Journals*, Vol. 21, pp. 207-240.

Cohen, M. and Nelson, C. (2011), *Financial Literacy: A Step for Clients towards Financial Inclusion*, draft paper, Washington, DC.

Coleman, J.S. (1994), "A rational choice perspective on economic sociology", in Smelser, N. and Swedberg, R. (Eds.), *The* Handbook of Economic Sociology, Princeton University Press, Princeton, NJ.

Cole, S., Sampson, T. and Zia, B. (2010), "Prices or knowledge? What drives demand for financial services in emerging markets?", *The Journal of Finance*, Vol. 66 No. 6, pp. 1933-1967.

Falk, I. and Kilpatrick, S. (2000), "What is social capital? A study of rural communities", *Sociologia Ruralis*, Vol. 40 No. 1, pp. 87-110.

Field, A. (2005), *Discovering Statistics Using SPSS*, Sage, London.

Financial Sector Deepening Uganda (2016), *Financial Inclusion Brief*, FSDU and DFID Quarterly Brief, Kampala, Uganda.

FinScope (2010), "Results of a National Survey on Demand, Usage and Access to Financial Services in Uganda", Steadman now Synovate (U) Limited Nakasero Road, Plot 32 Nakasero, Kampala. Steadman Group Publishing, Kampala, Uganda.

Floro, S.L. and Yotopolous, P.A. (1991), *Informal Credit Markets and the New Institutional Economics: the Case of Philippine Agriculture*, West view Press, Boulder.

Granovetter, M.S. (1973), "The strength of weak ties", *The American Journal of Sociology*, Vol. 78 No. 6, pp. 1360-1380.

Granovetter, M.S. (2004), "The impact of social structure on economic outcomes", *Journal of Economic Perspectives*, Vol. 19, No. 1, pp. 33-50.

Grohmann, A., Klühs, T. and Menkhoff, L. (2018), "Does financial literacy improve financial inclusion? cross country evidence", *World Development*, Elsevier, Vol. 111 No. C, pp. 84-96.

Godquin, M. and Quisumbing, R.A. (2005), *Groups, Networks, and Social Capital in Rural Philippine Communities*, A paper presented at the *International Research Workshop on Gender and Collective Action*, Chiang Mai, October 17-21.

Greenspan, A. (2002), "Financial literacy: a tool for economic progress", *Futurist*, Vol. 36, No. 4, pp. 37- 41.

Gretzel, U. (2001), *Social Network Analysis: Introduction and Resources*, available at: http://lrs.ed.uiuc.edu/tse-portal/analysis/social-network-analysis/ (accessed February 2014).

Grootaert, C. (2001), "Does social capital help the poor? A synthesis of findings from the local level institutions studies in Bolivia, Burkina Faso and Indonesia", *World Bank Local Level Institutions*, Working Paper No. 10, World Bank, Washington, DC.

Grootaert, C. (1999), *Social Capital, Household Welfare, and Poverty in Indonesia*, The World Bank: The World Bank Publications, Washington D.C.

Hair, J.F., Anderson, R.E., Tatham, R.L. and Black, W.C. (2010), *Multivariate Data Analysis*, 7th ed., Prentice Hall, Englewood Cliffs, NJ.

Hansen, M.T., (1999), "The search transfer problem: the role of weak ties in sharing knowledge across organisational subunits", *Administrative Science Quarterly*, Vol. 44 No. 1, pp. 82-111.

Hansen, M.T. (2002), "Knowledge networks: explaining effective knowledge sharing in multiunit companies", *Organization Science*, Vol. 13 No. 3, pp. 232-248.

Hayes, A.F. and Preacher, K.J. (2010), "Estimating and testing indirect effects in simple mediation models when the constituent paths are nonlinear", *Multivariate Behavioral Research*, Vol. 45 No. 4, pp. 627-660.

Heikkilä, A., Kalmi, P. and Ruuskanen, O.P. (2009), "Social capital and access to credit: evidence from Uganda", *The Journal of Development Studies*, Vol. 52 No. 9, pp. 1273-1288.

Jamison, J.C., Karlan, D. and Zinman, J. (2014), "Financial education and access to savings accounts. complements or substitutes? evidence from ugandan youth clubs", available at: youthsavings_researchbrief_ipa_a4_141107.pdf (accessed May 2014).

Jose, E.P. (2008), *Welcome to the Moderation/mediation Help Centre: Version 2.0*, School of Psychology, Victoria University of Wellington, Wellington.

Karlan, D.S. (2007), "Social connections and group banking", *Economic Journal*, Vol. 117, pp. F52-84.

Katz, N., Lazer, D., Arrow, H. and Contractor, N.S. (2005), "Applying a network perspective to small groups: theory and research", in Poole, M.S. and Hollingshead, A.B. (Eds.), *Theories of Small Groups: An Interdisciplinary Perspective*, Sage, Newbury Park, CA.

Kempson, E. (2009), *Framework for the Development of Financial Literacy Baseline Surveys: A First International Comparative Analysis*, OECD Working Papers on Finance, Insurance and Private Pensions, No. 1, OECD Publishing, doi: 10.1787/5kmddpz7m9zq-en.

Kendall, J., Mylenko, N. and Ponce, A. (2010), "Measuring Financial Access Around the World: Policy Research", Working Paper 5253, The World Bank Financial and Private Sector Development Financial Access Team March 2010.

Krackhardt, D. (1990), "Assessing the political landscape: structure, cognition and power in organization", *Administrative Science Quarterly*, Vol. 35 No. 2, pp. 342-369.

Lusardi, A. (2008a), "Household saving behavior: the role of financial literacy, information, and financial education programs", NBER Working Paper No. 13824.

Lusardi, A. (2008b), "Financial literacy: an essential tool for informed consumer choice?", NBER Working Paper, available at: www.nber.org/papers/w14084.

Lusardi, A. (2008c), "Increasing the effectiveness of financial education in the workplace", Centre for Research on Pensions and Welfare Policies, Working Paper 79/08.

Lusardi, A. (2003), "Planning and Saving for Retirement", Working Paper, Dartmouth College available at: http://www.dartmouth.edu/~alusardi/Papers/Lusardi_pdf.pdf.

Lusardi, A. and Mitchell, O. (2009), "How ordinary consumers make complex economic decisions: financial literacy and retirement readiness", NBER Working Paper No. 15350.

Lusardi, A., Samek, A., Kapteyn, A., Glinert, L., Hung, A. and Heinberg, A. (2017), "Visual tools and narratives: new ways to improve financial literacy", *Journal of Pension Economics and Finance*, Vol. 16 No. 3, pp. 297-323.

Lusardi, A. and Tufano, P. (2008), "Debt literacy, financial experience and over-indebtedness", Harvard School, Working Paper.

Lusardi, A. and Tufano, P. (2009a), "Debt literacy, financial experiences, and over indebtedness" National Bureau of Economic Research, Working Paper 14808.

Lusardi, A. and Tufano, P. (2009b), "Teach workers about the perils of debt", *Harvard Business Review*, pp. 22-24.

Lusardi, A., Michaud, P. and Mitchell, O. (2017), "Optimal financial knowledge and wealth inequality", *Journal of Political Economy*, Vol. 125 No. 2, pp. 431-477, doi: 10.1086/690950.

Mayhew, B. (1980), "Structuralism versus individualism: I-Shadowboxing in the dark", *Social Forces*, Vol. 59 No. 2, pp. 335-375.

McEvily, B., Perrone, V. and Zaheer, A. (2003), "Trust as an organizing principle", *Organization Science*, Vol. 14 No. 1, pp. 91-103.

Milroy, L. (1980), "Language and social networks", in *Language in Society 2*, Basil Blackwell, Oxford.

Nunnally, J.C. and Bernstein, I.H. (1994), *Psychometric Theory*, 3rd ed., Mcgraw-Hill, New York.

Organization for Economic Corporation and Development-OECD, (2013a) "Financial literacy framework", *OECD, PISA 2012 Assessment and Analytical Framework: Mathematics, Reading, Science, Problem Solving and Financial Literacy*, OECD Publishing, doi: 10.1787/9789264190511-7-en.

Organization for Economic Corporation and Development-OECD, (2013b) "Financial literacy and inclusion: Results of OECD/INFE survey across countries and by gender", OECD Publishing, Paris.

Organization for Economic Corporation and Development-OECD, (2013c) "Financial literacy framework", in *PISA 2012 Assessment and Analytical Framework: Mathematics, Reading, Science, Problem Solving and Financial Literacy*, OECD Publishing, Paris, p. 144, doi: 10.1787/9789264190511-7-en.

Organization for Economic Corporation and Development-OECD, (2009a) "Financial literacy and consumer protection: overlooked aspects of the crisis", OECD Publishing, Paris, available at: http://www.financial-education.org/dataoecd/32/3/43138294.pdf.

Organization for Economic Corporation and Development-OECD, (2009b) "PIAAC Literacy: A Conceptual Framework", OECD Education Working Paper No. 34, OECD Publishing, Paris, available at: http://www.olis.oecd.org/olis/2009doc.nsf/LinkTo/NT00006EDA/$FILE/JT03274637.PDF.

Organization for Economic Corporation and Development-OECD, (2009c) *PISA 2006 Technical Report*, OECD Publishing, Paris.

Organization for Economic Corporation and Development-OECD, (2009d) *Progress of the Work of the Expert Subgroup on the Evaluation of Financial Education Programs – Consultant Analytical Note: A Framework for the Evaluation of Financial Education Programs*, OECD Network on Financial Education, OECD, Mimeo Publishing, Paris.

Organization for Economic Corporation and Development-OECD, (2016), *OECD/INFE International Survey of Adult Financial Literacy Competencies*. The OECD Publishing, Paris.

Okello, G.C.B., Munene, J.C., Ntayi, J.M. and Akol, M.C. (2018) "Social network: testing the predictive power of its dimensions in explaining financial inclusion of the poor in rural Uganda", *African Journal of Economic and Management Studies*, Vol. 9 No. 3, pp. 388-406, doi: 10.1108/AJEMS-07-2017-0157.

Okten, C. and Osili, U.O. (2004), "Social networks and credit access in Indonesia", *World Development*, Vol. 32 No. 7, pp. 1225-1246.

Powell, W.W., Koput, K.W. and Smith-Doerr, L. (1996), "Interorganizational collaboration and the locus of innovation: networks of learning in biotechnology", *Administrative Science Quarterly*, Vol. 41 No. 1, pp. 116-145.

Preacher, K.J. and Hayes, A.F. (2008), "Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models", *Behavior Research Methods*, Vol. 40 No. 3, pp. 879-891.

Rangarajan Committee (2008), *Report of the Committee on Financial Inclusion*, Government of India. New Delhi, India.

Reagans, R.E. and McEvily, B. (2003), "Network structure and knowledge transfer: the effects of cohesion and range", *Administrative Science Quarterly*, Vol. 48, pp. 240-267.

Rogers, E. (1995), *Diffusion of Innovations*, 4th ed., Free Press, New York, NY.

Sekaran, U. (2003), *Research Methods for Business: A Skill Building Approach*, John Wiley & Sons.

Shaw, M.E. (1971), *Group Dynamics: The Psychology of Small Group Behavior*, McGraw-Hill, NY.

Stack, K. (2008), *Adult Learning Principles and Curriculum Design for Financial Education*, Microfinance Opportunities, Washington, DC.

Strang, D. and Tuma, B. (1993), "Spatial and temporary heterogeneity in diffusion", *American Journal of Sociology*, Vol. 99 No. 3, pp. 614-639.

Stiglitz, J.E. and Weiss, A. (1981), "Credit rationing in markets with imperfect information", *The American Economic Review*, Vol. 71 No. 3, pp. 393-410.

Supanantaroek, S. (2013), *Financial Literacy and Saving Attitudes of Children: Empirical Evidence for Uganda*, Aflatoun/PEDN Uganda Randomized Controlled Trial PEDN, Kampala, Uganda, available at: http://www.aflatoun.org/uganda_pedn_rct_2010-2013-(working-paper).pdf.

Tourangeau, R., Rips, L.J. and Rasinski, K. (2000), *The Psychology of Survey Response*, Cambridge University Press, Cambridge.

Uganda Bureau of Statistics (2012), *National Household Survey, Uganda Bureau of Statistics, National Household Statistical Forecast Brief*, The Government of Uganda, Kampala.

Uzzi, B. (1997), "Social structure and competition in inter-firm networks: the paradox of embeddedness", *Administrative Science Quarterly*, Vol. 42 No. 1, pp. 35-67.

Wasserman, S. and Faust, K. (1994), *Social Network Analysis*, Cambridge University Press, Cambridge, MA.

Wellman, B. (1988), "The community question Re-evaluated" in, *Power, Community and the City, Edited by Michael Peter Smith*, Transaction, New Brunswick, NJ, pp. 81-107.

Woolcock, M. (1999), "Learning from failures in microfinance: what unsuccessful cases tell us about how group-based programs work", *The American Journal of Economics and Sociology*, Vol. 58 No. 1, pp. 17-42.

Yamane, T. (1973), *Statistics: An Introductory Analysis*, 3rd ed., Harper & Row, New, York, NY.

World Bank (2009), *The Case for Financial Literacy in Developing Countries. Promoting Access to Finance by Empowering Consumers*, The World Bank, Washington DC.

About the authors

George Okello Candiya Bongomin holds a PhD, MSc (Accounting and Finance) and Bachelor's degree in Commerce (B.COM) from Makerere University Kampala, Uganda. He is a Research Fellow at Faculty of Graduate Studies and Research (FGSR), Makerere University Business School (MUBS), Kampala, Uganda and an international financial inclusion scholar. His research interests are in financial inclusion, digital financial services, development and business finance, rural finance (microfinance), behavioural finance, banking and finance practice, institutional economics, financial consumer protection and business psychology. George Okello Candiya Bongomin is the corresponding author and can be contacted at: abaikol3@yahoo.co.uk

Joseph Mpeera Ntayi, PhD, is a *professor of procurement and logistics management* and Dean, Faculty of Economics, Energy and Management Science, Makerere University Business School (MUBS), Kampala, Uganda. His teaching and research interests are in logistics, financial engineering, entrepreneurship, public procurement, managing contracts, business ethics, industrial marketing, purchasing and supply chain management. He is an entrepreneur and a public procurement and marketing consultant.

Charles Akol Malinga, MBA, is a Director of Currency at Bank of Uganda and a Lecturer at Department of Finance, Makerere University Business School, Kampala, Uganda. He has rich experience in investments and portfolio analysis, corporate finance, financial management, risk management, financial markets, and money and banking.