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Testing the predictive power of its dimensions in explaining financial inclusion of the poor in rural Uganda

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Abstract

Purpose – The purpose of this paper is to test for the predictive power of each of the dimensions of social network in explaining financial inclusion of the poor in rural Uganda.

Design/methodology/approach – The study employed a cross-sectional research design and data were collected from a total of 400 poor households located in Northern, Eastern, Central and Western Uganda. The authors adopted ordinary least square hierarchical regression analysis to test for the predictive power of each of the dimensions of social network in explaining financial inclusion of the poor in rural Uganda. The effects were determined by calculating the significant change in coefficient of determination (R^2) between the dimensions of social network in explaining financial inclusion. In addition, analysis of variance was also used to test for variation in perceptions of the poor about being financially included.

Findings – The findings revealed that the dimensions of ties and interaction significantly explain financial inclusion of the poor in rural Uganda. Contrary to previous studies, the results indicated that interdependence as a dimension of social network is not a significant predictor of financial inclusion of the poor in rural Uganda. Combined together, the dimensions of social network explains about 16.6 percent of the variation in financial inclusion of the poor in rural Uganda.

Research limitations/implications – The study was purely cross-sectional, thus, ignoring longitudinal survey design, which could have investigated certain characteristics of the variable over time. Additionally, although a total sample amounting to 400 poor households was used in the study, the results cannot be generalized since other equally marginalized groups such as the disabled persons, refugees, and immigrants were not included in this study. Furthermore, the study used only the questionnaire to elicit responses from the respondents. The use of interview was ignored during data collection.

Practical implications – Policy makers, managers of financial institutions, and financial inclusion advocates should consider social network dimensions of ties and interaction as conduits for information flow and sharing among the poor including the women and youth about scarce financial resources like loans. Advocacy towards creation of societal network that brings the poor together in strong and weak ties is very important in scaling up access to and use of scarce financial services for improving economic and social well-being.

Originality/value – Contrary to previous studies, this particular study test the predictive power of each of the dimensions of social network in explaining financial inclusion of the poor in rural Uganda. Thus, it methodologically isolates the individual contribution of each of the dimensions of social network in explaining financial inclusion of the poor. The authors found that only ties and interaction are significant predictors of financial inclusion of the poor in rural Uganda. Therefore, the findings suggest that not all dimensions of social network are significant predictors of financial inclusion as opposed to previous empirical findings.

Keywords Financial inclusion, Social network, Poor households, Rural Uganda, Information diffusion, Strength of weak ties

Paper type Research paper

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Background to the study

Globally, it has been recognized that financial inclusion is a fundamental ingredient for growth and development, especially in underdeveloped economies. According to Centre for Financial Inclusion at ACCION (2011), "full financial inclusion is a state in which all people who can use financial services have access to a full suite of quality financial services provided at affordable prices, in a convenient manner, and with dignity for the clients." The Ministry of Finance, Planning and Economic Development (MoFPED, 2002–2009) in Uganda defines a poor person as "an individual who faces the situation of poor health, low level of income and consumption, unemployment, illiteracy, low level of production, physical insecurity, disempowerment, and isolation socially and geographically." While Wasserman and Faust (1994) refers to social network as a social structure made up of a set of social actors (such as individuals or organizations), dyadic ties, and other social interaction between actors with similar interest.

The World Bank (2014) suggests that financial inclusion plays a great role in reducing poverty at the individual, household, business, and community levels by enabling people to manage their economic lives more effectively with less vulnerability to shocks. Scholars like Johnson and Nino-Zarazua (2011) assert that providing all unbanked households like the poor with access to full range of financial services such as payments, remittances, savings, insurance, and loans helps them to come out of poverty. However, although several efforts have been adopted to improve on the scope of financial inclusion based on both the supply and demand side strategies, majority of the poor, especially in developing countries still remain largely excluded from access to and use of basic financial services (Demirgüç-Kunt *et al.*, 2015). Indeed, high cost associated with fees and minimum balances, lack of physical access, unsuitable financial products, long loan processing time, strict documentation, and collateral requirements have resulted into both voluntary and involuntary financial exclusion of the poor worldwide (See for e.g. Chikalipah, 2017; Beck *et al.*, 2009).

Findings by, the World Bank (2015) revealed that 54 percent of adults in developing economies do not have access to a bank account as compared to 94 percent in high-income OECD economies. Contextually, Financial Sector Deepening Uganda (2016) indicates that over 80 percent of Ugandans, especially those residing in the rural areas do not have bank accounts with gross domestic savings standing at only 13.28 percent. This is supported by Agarwal (2008) who contends that many formal financial institutions are not interested in serving the poor because of lack of enough information and physical collateral, which culminates into the unforeseen problems of adverse selection and moral hazard in lending. Consequently, in order to take banking services near to the poor, some financial institutions have introduced financial schemes such as group lending based on joint liability by members in networks. Thus, through the existing local networks, which promotes collective responsibility for borrowings, the poor have been able to access financial services.

Theoretically, proponents of the network theory posit that node centrality, density, robustness, and transitivity (See for e.g. Blau, 1977; Mayhew, 1980; Wellman, 1988; Brass and Burkhardt, 1993; Powell *et al.*, 1996; Bavelas, 1950; Shaw, 1971) that enhance tie strength and the level of interaction between actors may affect the degree of information flow and sharing. Granovetter (1973) argues that actors within a weak network have great flow of new ideas (information) about existing opportunities because it connects individuals who are significantly different from one another due to weak ties. Accordingly, the weak ties become special to individuals because they act as bridges between diverse actors through which information and resources can flow beyond those within their own social circle. Drawing from another perspective, strong ties that involve interaction between close-knit members exhibit greater motivation for assistance among the members. Correspondingly, Pool (1980) argues that whether one uses weak or strong ties, it depends not only on the

number of ties one has at various levels of tie strength but also on the utility of the ties of different strength (See also Ericksen and Yancey, 1977; Stack, 1974). Thus, the poor in both weak and strong ties have increased capacity to access market information with limited search cost about existing opportunities.

Therefore, the poor in densely knit associational network of ties can gain access to useful information about the characters and behaviors of their members, which they can use when they want to borrow from the banks (Granovetter, 1983). This helps to reduce repayment problem emanating from information asymmetry in lending (Ahlin and Townsend, 2007). The World Bank (2002) contends that in many poor regions of the world, social network becomes relevant for economic exchange because it acts as a selection and monitoring tool. This corroborates with Biggs *et al.* (2002) who assert that in accessing financial services, social network helps the poor by supplying information about the credit worthiness of their colleagues. Indeed, social network acts as a screening device for selecting potential members in the lending process (Aryeetey, 2005). Similarly, the presence of social network among the poor helps them to obtain more information about the different types of financial services provided by banks.

However, although several studies such as Khanh (2011), Heikkilä *et al.* (2009), Lawal *et al.* (2009), Yokoyama and Ali (2006), Ahlin and Townsend (2007), Okten and Osili (2004), Karlan (2007), Narayan and Pritchett (1997), and Grootaert (2001) have used social network to explain financial inclusion, especially in developing countries, they fail to test the predictive power of its dimensions in explaining financial inclusion. Consequently, this study contributes to previous findings by isolating the individual contribution of each of the dimensions of social network of ties, interaction, and interdependence, which promotes information flow about availability of financial services. Moreover, social network through its dimensions also act as a mechanism for screening, monitoring, and enforcing contracts in group lending. Therefore, the main purpose of this study is to test for the predictive power of each of the dimensions of social network in explaining financial inclusion of the poor in rural Uganda. This is premised on the fact that over 80 percent of the population in rural Uganda have been largely excluded from access to and use of formal financial services.

Literature review and hypotheses development

This section involves review of relational literature that focuses on the different dimensions of social network and financial inclusion. The literature reviewed relates to ties and financial inclusion, interaction and financial inclusion, and interdependence and financial inclusion. Overall, relational literature between social network and financial inclusion is also covered under this section.

Social network and financial inclusion: theoretical perspective

The network theory posits that node centrality, density, robustness, and transitivity that enhance tie strength and the level of interaction among actors can affect the degree of information flow and sharing (Katz *et al.*, 2005; Wellman, 1988; Brass and Burkhardt, 1993; Powell *et al.*, 1996; Shaw, 1971). Hypothetically, as the frequency of interaction increases, interactive behavior becomes more intense, less complex and increasingly repetitive among the actors, which results into interdependence. Indeed, the existence of social ties, which promotes interaction and interdependence among actors in a network can result into access to scarce resources.

Consequently, proponents of network theory like Granovetter (1973), Burt (1992) have advocated for the importance of personal connections in seeking information for economic benefits such as access to loans for business ventures. Therefore, the poor who are in dense social networks help banks to gain access to useful information about financial

characters and behaviors of their colleagues who want to borrow (Granovetter, 1983). This reduces the problem of repayment resulting from information asymmetry rampant in lending (Ahlin and Townsend, 2007). Similarly, the presence of social network helps the poor to obtain more information about financial services provided by the banks.

Furthermore, Burt (1992) also argues that the concept of structural holes in social structure creates a competitive advantage for an individual whose network spans the holes. The poor connected within the same group as friends, and friends of friends make them well informed because these relationships act as conduits for information sharing about what is happening in the friend of friends' group from the opposite sides of the holes. Thus, participation by poor individuals in local social network (kin and friends) and attitude of mutual trust makes it easier for them to reach collective action that increases information availability, which lowers transaction cost and opportunistic behavior in borrowing (Grootaert and Bastelaer, 2002).

Additionally, Yokoyama and Ali (2006) also assert that network tie increases the capacity of the poor to access market information, which reduces information search cost. Thus, van Bastelaer (2000) argues that social network becomes an important element through which most financial service providers can extend basic financial services to the poor. Indeed, social network structures of ties, interaction, and interdependence provide information about the credit worthiness of the poor and existing sources of financial services. Therefore, the following general hypothesis is derived:

H1. Social network dimensions significantly affect financial inclusion of the poor in rural Uganda.

Ties and financial inclusion

According to Granovetter (2005), a tie is defined as "information-carrying connections between people." He argues that ties come in three varieties of strong, weak, and absent. A strong tie refers to larger time commitments between individuals who are closely tied (family and relatives), while a weak tie refers to individuals who are not closely tied to a group such as people who move frequently or live in isolated areas (friends and acquaintances).

Correspondingly, network theorists believe that how an individual live depends in large on how that individual is tied into the larger web of social connections. Based on Granovetter's (1973) concept of strength of weak ties that bridge otherwise disconnected people, each person has a great many contacts that provide the only route along which information or influence can flow from any contact amongst themselves. Thus, anyone connected indirectly or directly to these parties benefits. Indeed, information flow and sharing among actors in networks is important for forging ties within and across communities. The poor's access to opportunities and resources can only be fully exploited if they are linked to others in diverse positions who furnish them with different information. Ties with local bridges that connect poor individuals from different structural holes lead to acquisition of diverse information about availability of financial services offered by banks (Burt, 1986). Besides, the available information can be used by the poor to select prospective borrowers and for monitoring loan repayment within the groups.

Floro and Yotopolous (1991) contend that social ties and the resulting potential for sanctions among the poor helps to mitigate adverse selection and moral hazard problems in joint liability lending contracts. Social network enhances great flow of information within closed and weak networks of actors. Therefore, social network helps in distributing information about credit worthiness of individuals and reputation to lenders (Aryeetey, 2005). This is consistent with Grootaert (2001) who suggests that social network act as a borrower screening device for selection of clients who are potential borrowers in loan

granting process. Findings by Okten and Osili (2004) revealed that network ties led to increased flow of information about credit availability among borrowers in Indonesia. Thus, existence of social ties with strong social sanction can result into improved access to and use of financial services, especially among the poor. The BancoSol microfinance program in Bolivia is a typical success story (See for e.g. Gomez and Santor, 2001). Thus, here we hypothesize that:

H1a. Ties significantly affect financial inclusion of the poor in rural Uganda.

Interdependence and financial inclusion

Griffin *et al.* (2011) defined interdependence as "the exchange between actors in a relationship characterized by cooperation, interaction, and competition coupled with costly reciprocal effect of transaction among the actors." Additionally, Colchester (2016) also suggests that interdependence involves interconnection/linkage among actors and systems of interrelationships of actors. Therefore, it entails a relationship in which two or more parties are linked in a system of action in such a way that changes in one party impact in some meaningful way on the attainment of needs, values and/or desired outcomes of the others. Thus, the satisfaction of each party's needs and values is contingent to some degree on the behavior of others.

Consequently, Coleman (1990) suggests that a dense network of individuals, which allows network members to receive support and information among themselves can result into interdependence among actors because of group cooperation. Furthermore, Burt (2000) also stipulates that individuals who are connected to certain others, trusting certain others, obligated to support others, and dependent on certain exchange with certain others can be an asset on its own. Participation in networks that spans beyond ones hole results into diffusion of information about scarce resources. Thus, structural holes create interdependence by bringing poor households from either side of the holes, which creates opportunity for information flow (Burt, 1992).

Indeed, the poor use their existing social networks as social collateral in the process of borrowing from banks (See for e.g. Lawal *et al.*, 2009). Correspondingly, a study by Karlan (2007) revealed that there was a high repayment rate among randomly selected poor borrowers in bridging relationship in Peru. The information received from interdependent actors from across different bridges was essential for screening loan applications and for ensuring that contracts were enforced.

However, on the contrary, sometimes other members within the network may default on their loans because the way in which individuals' goals are structured determines how they interact, i.e. the type of relationships between individuals determine their access to scarce resources such as loans (Colchester, 2016). This is directly linked to the concept of negative interdependence where individuals perceive that they can obtain their goals if and only if the other individuals with whom they are linked fail to obtain their goals. This may result into interaction and cooperation without interdependence among actors in a social structure. Hence, here we hypothesize that:

H1b. Repeated interdependence significantly affect financial inclusion of the poor in rural Uganda.

Interaction and financial inclusion

According to Verweij (2011), social interaction is generally described as "the contact with others" or "the behaviour between two or more people." Additionally, Engelmann (1980) defined it "as any relationship between two or more individuals." Consequently, Granovetter (2004) argues that within a given network, who interacts with whom, how frequently, and on

what terms affect the flow of information and resources. Indeed, individuals with dense networks encounter great flow of information and ideas about existing opportunities.

Similarly, Homans (2002) further states that the 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. Besides, Fukuyama (1995) connotes that trust that increases interaction among individuals in a network enhances economic achievements by lowering transaction costs.

Conversely, social network increases the capacity of the poor to access market information and reduces its search cost, hence, creating tie networks among the poor in lending groups (Yokoyama and Ali, 2006). Additionally, Grootaert (2001) also elucidates that social network provides information about existing sources of financial services among the poor in the society. Thus, interaction within social network helps the poor to have access to credit and also encourages them to follow the repayment schedule of the lenders. Ahlin and Townsend (2007) contend that social network between the poor are essential tools for recommending members and ensuring that contracts are enforced. Therefore, here we hypothesize that:

H1c. Continuous interaction significantly affect financial inclusion of the poor in rural Uganda.

Methodology and study approach

Research design, setting and procedure

The study adopted both descriptive and analytical research designs and data were collected from poor households living in rural Uganda. Three poverty indicators of households' utilities, housing conditions, and households' welfare were used to identify poor households who were selected for the study in line with Uganda Bureau of Statistics (2012). Thus, a total sample of 400 poor households drawn from a population of 1.2 million poor households was selected for the study using formulae recommended by Yamane (1973). The sample was arrived at using the formulae: $n = [N/1+N(e)^2]$: where; n = sample size; N = total population; e = tolerable error (0.05 or 95 percent). Thus, this study used a total sample of 400 poor households obtained from rural Uganda. The α level was set at 0.05, the effect size was considered medium, and the desired power set at 0.80. Simple random sampling using list of poor households obtained from Uganda Bureau of Statistics (2014) population forecast and PRIDE Microfinance Deposit-taking Institution Data Base (2013) was used in selecting poor households for this study. The poor individuals selected for this study were those who needed business loans according to PRIDE Microfinance Deposit-taking Institution Record (2013). The study focused on poor household heads as the main unit of inquiry and poor households as the unit of analysis. The random sampling procedure resulted into 400 respondents who participated in this study. Data collected were aggregated at the household level during data analysis since the main focus was on poor households. The semi-structured questionnaire comprising of items adopted from previous studies were used to elicit responses from the respondents. The items adopted in the instrument were subjected to a pilot study involving 200 poor households from Mukono District. The final questionnaire had items, which were concise with vague and ambiguous questions being re-worded for precision.

Measurement of variables and questionnaire

Social network variable comprising of its constructs of interaction, ties, and interdependence were measured using items adopted from previous scholars. The measurement items were developed based on three poverty indicators of households' utilities, housing conditions, and

households' welfare as stipulated by Uganda Bureau of Statistics (2012). The items were anchored onto a five-point Likert scale ranging from strongly disagree (1) to strongly agree (5).

The measurement items included: in this household, most members participate in social organizations in this community; members of this household belong to social groups with members from diverse ethnicity; in this household, we belong to social groups which frequently interact with other groups outside this community; in this household, members have many people beyond this household that we can turn to in case we needed help; most of the members in this household are friends to friends who know each other; in this household, some members are friends to prominent people in this community; in this household, we have people we can call upon for help; in this household, we are always visited by friends when we get problems; my household members have many friends with whom we are very close within and outside this community. The combined Cronbach α coefficient results for all the items = 0.925, mean = 3.97 and standard deviation = 0.554.

Financial inclusion was measured using ten items anchored onto a five-point Likert scale ranging from strongly disagree (1) to strongly agree (5). The items included: the initial account opening fee charged by the financial institution is affordable; the savings product provided by the financial institution suits our needs; the loan product provided by the financial institution suits our needs; the savings product provided by the financial institution is safe for us; the payment services provided by the financial institution are safe for us; the cost of making a trip to the financial institution is low; the terms of repayment of loans provided by the financial institution are favorable to us; the products/services provided by the financial institution have improved our access to amenities; the products/services provided by the financial institution have improved our access to utilities; the products/services provided by the financial institution have improved our nutrition. The overall Cronbach α coefficient = 0.938, mean = 3.66 and standard deviation = 0.496.

Test for convergent validity

According to Hair *et al.* (2010), exploratory factor analysis is carried out to test for the number of factors that can be seen as an analysis of the construct validity of a scale. It determines the number of aspects of a construct that a set of items can measure and it checks if there are items that do not measure the construct. As a rule of thumb, factor analysis is performed most often only on metric variables, although specialized methods exist for the use of dummy variables. Thus, principal component analysis (PCA) using varimax with Kaiser normalization was performed to reduce the number of variables under social network. The results indicated that nine items loaded well on the constructs of social network with a total of three components. The KMO was sufficient at 0.749 to predict that the data were likely to factor well based on correlation and partial correlation between the variable constructs. Furthermore, only items with absolute values above 0.50 were taken to determine the loadings on each of the factors of social network. PCA was performed to test the components of social network, which yielded three factors with eigenvalues greater than 1. The results indicated that three factors of interaction (29 percent), ties (17 percent), and interdependence (14 percent) emerged, thus, accounting for 60 percent of the total variance in social network. The results further revealed that four items of interaction loaded well on factor 1 with significant loadings of 0.535–0.711, which explained 29 percent of the variance, and three other items of ties loaded well on factor 2 with significant loadings of 0.690–0.739, which accounted for 17 percent of the variance. Finally, two other items of interdependence loaded well on factor 3 with significant loadings of 0.673 and 0.785, which accounted for 14 percent of the variance. Therefore, it was established that interaction (29 percent) explained more of social network, followed by ties (17 percent) and interdependence (14 percent).

Similarly, PCA using varimax with Kaiser normalization was performed to reduce the number of items under financial inclusion. The results indicated that ten items loaded well on the constructs of financial inclusion with a total of four components and KMO of 0.732. Furthermore, only items with absolute values above 0.50 were taken to determine the loadings on each of the factors of financial inclusion. The results of the PCA using varimax with Kaiser normalization yielded four factors with eigenvalues greater than 1. The analysis of the results indicated that three items of welfare loaded on factor 1 with significant loadings between 0.754 and 0.756, which explained 22 percent of the variance. Furthermore, three items of quality loaded on factor 2 with significant loadings between 0.692 and 0.801, which explained 15 percent of the variance, while two other items of usage loaded on factor 3 with significant loadings of 0.674–0.788, which explained 12 percent of the variance. Finally, two more items of access significantly loaded on factor 4. The loadings ranged between 0.747 and 0.785, which explained 11 percent of the variance. Therefore, overall, the four factors of financial inclusion accounted for 60 percent of the total variance with welfare (22 percent) explaining a larger percentage of the variation, followed by quality (15 percent), usage (12 percent), and access (11 percent), respectively.

Results

Sample characteristics

The study obtained 100 percent response rate for the unit of analysis. This was achieved because data were collected through local community leaders like local council chairmen/chairpersons and the community civic leaders and educators. Besides, language barrier, which could have resulted into none responses, was solved by recruiting research assistants from the particular regions were the study was done. The age of the respondents averaged between 26 and 33 years. The results also indicated that 64 percent of the respondents were male, and 36 percent were female. From the literacy perspective, 60 percent of the poor households' heads were able to read and write, while 40 percent could not read and write. Furthermore, the results from the study also revealed that 83 percent of the respondents used all basic financial products provided by the bank, while 17 percent used only specific financial products.

Correlation and regression analyses

Correlation analysis results

Pearson correlation analysis involving two-tailed test was performed to establish the relationships between the constructs of social network and financial inclusion (Field, 2005). The results are indicated in Table I.

The correlation results indicated that ties and financial inclusion are significantly and positively related ($r = 0.353$, $p \leqslant 0.01$). Proponents of social network believes that how an individual live depends in large on how she/he is tied into the larger web of social connections. Granovetter (2004) argues that ties between the poor enables them to have better access to information and ideas about any existing opportunity.

	1	2	3	4	5
Interaction (1)	1				
Ties (2)	0.610**	1			
Interdependence (3)	0.602**	0.694**	1		
Social network (4)	0.891**	0.892**	0.794**	1	
Financial inclusion (5)	0.283**	0.353**	0.165**	0.421**	1

Notes: $n = 400$. **Correlation is significant at the 0.01 level (2-tailed)

Table I.
Zero-order correlations between social network constructs and financial inclusion

Accordingly, Floro and Yotopolous (1991) contend that social ties and the resulting potential for sanctions among the poor helps them to mitigate adverse selection and moral hazard problems in joint liability lending contracts. This lends support to *H1a*, which stated that ties significantly affect financial inclusion of the poor in rural Uganda.

Additionally, the correlation results also showed that there is a significant and positive relationship between interdependence and financial inclusion ($r = 0.165$, $p \leqslant 0.01$). This supports *H1b*, which stated that repeated interdependence significantly affect financial inclusion of the poor in rural Uganda. Gretzel (2001) and Wasserman and Faust (1994) suggest that dyadic relations and interdependence among actors such as the poor, promotes information flow and sharing within such networks. Burt (2000) also argues that poor individuals who are connected to certain others, trusting certain others, obligated to support others, and dependent on certain exchange with certain others can be an asset on its own. Indeed, participation in social network that spans beyond a poor individual's hole can result into diffusion of information about scarce resources. Thus, structural holes create interdependence by bringing poor individuals from either side of the holes, which creates opportunity for information flow.

Besides, the correlation results revealed that there is a significant and positive relationship between interaction and financial inclusion ($r = 0.283$, $p \leqslant 0.01$). This is in line with *H1c*, which stated that continuous interaction significantly affect financial inclusion of the poor in rural Uganda. Katz *et al.* (2005) observe that within a given network, who interacts with whom, how frequently, and on what terms affect the flow of information and resources.

Conclusively, social network as a global variable had a significant and positive relationship with financial inclusion ($r = 0.421$, $p \leqslant 0.01$). van Bastelaer (2000) suggests that social network is important element through which most banks extend basic financial services to the poor. Similarly, Biggs *et al.* (2002) argue that in accessing financial services, social network helps the poor by supplying information and it act as a mechanism for enforcement. This finding is in support of *H1* that suggested that social network dimensions significantly affect financial inclusion of the poor in rural Uganda.

Regression analysis results

Hierarchical regression was adopted to determine the predictive power of each dimension of social network in explaining financial inclusion of the poor in rural Uganda.

The regression results in Table II indicated that there is a significant and positive relationship between ties and financial inclusion ($\beta = 0.318$, $p < 0.01$). This supports *H1a*, which stated that ties significantly affect financial inclusion of the poor in rural Uganda. Granovetter (1973) contends that weak ties that bridge otherwise disconnected poor people provide the only route along which information can flow. Consequently, anyone connected indirectly or directly to these parties benefits. Indeed, information flow and sharing among the poor in social network is important for forging ties within and across communities. Accordingly, Grootaert (2001) argues that social network act as a screening device for selecting potential borrowers in loan granting process. Correspondingly, Okten and Osili (2004) revealed that social network led to increased flow of information about credit availability among borrowers in Indonesia. Thus, existence of social ties with strong social sanction can result into improved access to and use of financial services, especially among the poor.

More so, the results revealed that there is a significant and positive relationship between interaction and financial inclusion ($\beta = 0.279$, $p < 0.01$). This finding supports *H1c* which stated that continuous interaction significantly affect financial inclusion of the poor in rural Uganda. Correspondingly, Grootaert (2001) observes that social network provides information about existing sources of financial services

Predictor	Dependent variable: financial inclusion Model 1	Model 2	Model 3	VIF
Constant	13.806	9.952	9.837	
Control variables				
Gender	−0.036	−0.021	−0.023	
Age	0.011	0.028	0.029	
Literacy level	−0.374	−0.115	−0.114	
Networks				
Interaction	0.279**	0.225**	0.222**	1.109
Ties		0.318**	0.314**	1.157
Interdependence			0.020	1.103
R^2	0.099	0.190	0.191	
Adj. R^2	0.080	0.169	0.166	
ΔR^2	–	0.091	0.001	
ΔF	16.136**	21.898**	0.085	
Durbin Watson			1.560	

Notes: $n = 400$. $^{**}p < 0.01$

Table II.
Hierarchical regression analysis

among the poor in the society. Indeed, interaction within social network helps the poor to access credit and as well encourages them to follow the repayment schedule of the lenders.

However, the results indicated that interdependence has no significant impact on financial inclusion. This contradicts *H1b*, which asserted that repeated interdependence significantly affect financial inclusion of the poor in rural Uganda. This finding is contrary to a study by Karlan (2007), which revealed that there was a high repayment rate among randomly selected poor borrowers in bridging relationship in Peru. The information received from interdependent actors from across different bridges was essential for screening loan applications and for ensuring that contracts were enforced. The inconsistent finding can be explained by the fact that many people in Uganda today fear to provide social collateral to others with whom they belong in the same network. This is because people can interact but with different goals that can affect interdependence (negative interdependence) among actors. Thus, many people in Uganda have turned away from helping others in the process of borrowing from the banks (See for e.g. Colchester, 2016).

Additionally, analysis of variance (ANOVA) was also run to determine the perceptions of poor households' interaction, ties, and interdependence on financial inclusion. The results indicated that the poor did not significantly differ in their perceptions based on age about being financially included. This is justified by the p-value, which are insignificant at ($p > 0.05$) as stipulated by Field (2005). The ANOVA results are indicated in Table III.

Discussion and research implications

The main purpose of this paper is to test the predictive power of each of the dimensions of social network in explaining financial inclusion of the poor in rural Uganda. The findings from the study are discussed below.

Ties and financial inclusion

The results from the study indicated that there is a significant and positive relationship between ties and financial inclusion. Scholars like Bourdieu and Wacquant (1992) and Piore and Sabel (1984) stipulate that network ties that create trust and forbearance through embeddedness, helps individuals to access scarce resources as all in the society are

	Sum of squares	df	Mean square	*F*	Sig.
Interaction					
Between groups	0.006	1	0.006	0.009	0.923
Within groups	135.952	399	0.687		
Total	135.959	400			
Tie					
Between groups	0.499	1	0.499	1.839	0.177
Within groups	53.706	399	0.271		
Total	54.205	400			
Interdependence					
Between groups	0.097	1	0.097	0.562	0.454
Within groups	34.314	399	0.173		
Total	34.412	400			

Table III.
ANOVA for social network constructs

considered one beneficiary (Burt, 2001). Network analysts believe that how an individual live depends on how she/he is tied into the larger web of social connections. Additionally, ties that bridge otherwise disconnected poor individuals provide the only route along which information or influence can flow. Thus, anyone from the poor households who is connected indirectly or directly to these parties become a beneficiary. Accordingly, poor individuals with dense networks encounter great flow of information and ideas about existing opportunities. Poor people rely more on strong ties than others do because the ties make them benefit from one another in the network. Kin and close friends in a network lead to cooperative support for survival because of the urgency of individual needs. Furthermore, poor households connected within the same group as friends, and friends of friends make them well informed because these relationships act as conduits for information flow about what is happening in the friends of friends' groups from the opposite sides of the holes. Similarly, structural holes in networks also enrich information flow between different clusters resulting into increased access to resources, markets, and new opportunities as information overlap is minimized. Conclusively, Ahlin and Townsend (2007) contend that social ties reduce repayment problems among poor borrowers.

Interaction and financial inclusion

Besides, the results from the study showed that there is a significant and positive relationship between interaction and financial inclusion. This finding is in line with Homans (2002) who concurred that the 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. Additionally, Fukuyama (1995) also observes that trust that increases interaction among poor individuals in a network enhances economic achievements by lowering transaction costs. Furthermore, Ahlin and Townsend (2007) also contend that social networks between poor households are essential tools for recommending members and ensuring that contract is enforced. Indeed, poor individuals with dense networks encounter great flow of information and ideas about existing opportunities. Thus, interaction within social network helps the poor to have access to credit and also encourages them to follow the repayment schedule of the lenders.

Interdependence and financial inclusion

More so, the results from the study revealed that interdependence and financial inclusion are not significantly and positively related. Contrary to this finding, Granovetter (1973) and

Burt (1985) suggest that weak ties and structural holes in networks enrich information flow between different clusters. This results into interdependence due to increased access to resources, markets, and new opportunities as information overlap is minimized. Furthermore, Coleman (1990) also observes that a dense network of poor individuals, which allows network members to receive support and information among themselves, can result into interdependence because of group cooperation. However, Griffin *et al.* (2011) argue that interdependence is characterized by cooperation, interaction, and competition coupled with costly reciprocal effects of transaction among the actors. This may affect the level of interdependence within the social structure. Indeed, actors in networks may fail to reap benefits from interdependence due to the costly reciprocation. Being in social networks of relationships may not automatically result into financial interdependence among actors. Most people can have connections that involve interactions and interdependence but this may not necessarily result in financial benefits. This could be due to opportunism, which is becoming a common behavior among individuals in developing countries like Uganda.

Additionally, selected borrowers may also provide information about their members that seems to be right because they want them to access money to solve their domestic problems other than lack of business capital. Hence, after getting the money, they use it for other purposes and not for business as stated during the loan application process. This may lead to sanctions and social exclusion of some members within the social network. Similarly, some individuals may interact due to the existing ties. However, the interaction may not necessarily result in positive interdependence. This is common in Uganda today where many people share ideas and information but with different goals. Consistent with this argument, Heikkilä *et al.* (2009) found that most poor households in rural Uganda rely more on family trust than generalized trust in the process of accessing and using financial services from financial institutions.

Conclusions

The main purpose of this paper is to test for the predictive power of each of the dimensions of social network in explaining financial inclusion of the poor in rural Uganda.

The results from the study indicated that ties significantly affect financial inclusion of the poor in rural Uganda. Network ties that create trust and forbearance through embeddedness, helps individuals to access scarce resources as all in the society are considered one beneficiary. This finding is in line with *H1a*.

Furthermore, the study also found that interaction significantly affect financial inclusion of the poor in rural Uganda. This confirms *H1c*. Indeed, within a given network, the level and frequency of interaction affect the flow of information and resources. Thus, individuals with dense networks encounter great flow of information and ideas about existing opportunities.

Finally, the results revealed that interdependence does not significantly affect financial inclusion of the poor in rural Uganda. This does not support *H1b*. Indeed, being in social network of relationships does not automatically result into financial interdependence among actors. Most people can have connections that involve interactions and interdependence but this may not necessarily result into financial benefits. The way in which goals are structured determines how individuals interact, i.e. the types of relationships between them.

Recommendations

Based on the study findings, we therefore, recommend that:

(1) Policy makers, managers of financial institutions, and financial inclusion advocates should consider social network dimensions of ties and interaction as conduits for information flow and sharing among the poor including the women and youth about

scarce financial resources like loans. Advocacy towards creation of societal networks such as burial groups, fathers and mothers union, and youth groups that bring individuals together in strong and weak ties is very important in scaling up access to and use of scarce resources like financial services for economic and social well-being.

(2) Managers of financial institutions should use existing social network structures in rural communities to provide financial services to the poor who rely on their networks as information source. Banks should use existing social networks as channels for providing financial services like loans since the networks will provide them with vital information about the borrowers. This will help them to reduce the problem of default in repayment emanating from adverse selection and moral hazard, hence, increased level of financial inclusion.

(3) Financial inclusion practitioners and civil society advocates should encourage the poor including women and youth within their respective communities to form local bridges (weak social ties) that influence fast flow of credible information about sources and availability of financial services. The poor should be encouraged to form voluntary community social networks that can be used to obtain useful ideas and information about existing opportunities such as access to financial services.

(4) The policy makers should consider including a clause under the Financial Institution Act that prescribes the role of social network in smoothening the process of borrowing money from banks. This will solve the problem of high cost incurred by banks in providing financial services to the poor.

Limitations and areas for further study

The study was purely cross-sectional, thus, ignoring longitudinal survey design, which could have investigated certain characteristics of the variable over time. Additionally, although a total sample amounting to 400 poor households was used in the study, the results cannot be generalized since other equally marginalized groups such as disabled persons, refugees, and immigrants were not included in this study. Furthermore, the study also used only the questionnaire to elicit responses from the respondents. The use of interviews was ignored during data collection. Finally, there is a need to carry out more investigation on the insignificant effect of interdependence on financial inclusion using data from other samples and context.

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(The Appendix follows overleaf.)

Appendix. Survey questionnaire

Section 1: Background information

Please kindly tick appropriately

1. Gender 1) Male _____ 2) Female _____
2. Age Group
   1) 18 – 25 _____ 2) 26 – 33 _____ 3) 34 – 41 _____
   4) 42– 49 _____ 5) 50+ _____
3. Number of people in your household
   1) 5 or less _____ 2) 6 – 10 _____ 3) More than 10 _____
4. Type of dwelling unit for this household
   1) Temporary Building Materials _____ 2) Semi-permanent Building Materials _____
   3) Permanent Building Materials _____
5. Number of years lived in this community
   1) 5 years or less _____ 2) 6 – 10 years _____ 3) 11 – 15 years _____
   4) More than 15 years_____
6. What is the primary source of water for this household?
   1) Piped water system _____ 2) Private well _____ 3) Public well _____
   4) Borehole _____ 5) River or stream _____
   6) Other (specify) _____
7. What type of toilet facility does this household use?
   1) Community pit latrine _____ 2) Individual pit latrine _____ 3) Bush _____
   4) Other (specify) _____
8. What type of lighting does this household use?
   1) Paraffin lantern _____ 2) Small kerosene lamp _____ 3) Firewood _____
   4) Other (specify) _____
9. What type of cooking fuel does this household use?
   1) Firewood _____ 2) Charcoal _____ 3) Paraffin _____
   4 Other (specify) _____
10. Are you able to read and write?
    1) Yes _____ 2) No _____

Section 2: Social network

Please circle the most appropriate option for each of the questions below;
Strongly agree (5), agree (4), not sure (3), disagree (2) strongly agree (1)

Ties

T1 In this household, some members are leaders in social groups to which they belong
T2 In this household, we belong to social groups where most members are neighbours
T3 In this household, we belong to social groups with members from diverse occupations
T4 In this household, we belong to social groups with members from diverse religion
T5 Members of this household belongs to social groups with members from diverse ethnicity
T6 Members of this household belongs to social groups with members from diverse age groups
T7 Most of the members in this household are friends to friends who know each other

Interaction

INT1 In this household, members always get together with friends to play games and recreational activities
INT2 In this household, most members participate in social organizations in this community
INT3 In this household, most members participate in activities of diverse social organizations
INT4 In this household, most members are highly involved in activities of social organization to which they belong
INT5 Members of this household always get together with others regularly to do an activity

Interdependence

IND1 In this household, members have many people beyond this household that we can turn to in case we needed help
IND2 In this household, we have many stable friendships and we support and trust each other
IND3 In this household, members have people they feel at ease with
IND4 In this household, we have people we can talk to about our private matters
IND5 In this household, we have people we can call upon for help
IND6 Members of this household closely talk to many households in this community when they have problems
IND7 Members within this household can easily approach other households within this community when they have problems
IND8 In this household, we always go outside this community to visit
IND9 In this household, we are always visited by friends when we get problems
IND10 In this household, we always ask neighbours to take care of our children when we are away

Section 3: Financial inclusion

Please circle the most appropriate option for each of the questions below;
Strongly agree (5), agree (4), not sure (3), disagree (2) strongly disagree (1)

	Access
ACC1	There are many financial services delivery channels nearby this household
ACC2	There are many financial institution branches nearby this household
ACC3	The initial account opening fees charged by the financial institution is affordable
ACC4	The account maintenance fees charged by the financial institution is affordable
ACC5	The minimum balance on savings account required by the financial institution is affordable
ACC6	The loan fees charged by the financial institution is affordable
ACC7	The minimum loan amount offered by the financial institution is satisfactory
ACC8	The numbers of documents required by the financial institution to open an account are few
ACC9	The number of days taken by the financial institution to process loan applications is favourable
ACC10	In this household, we are not discriminated by the financial institution in its service provision
ACC11	The location to submit loan application required by the financial institution is favourable
ACC12	The fees charged on payment services offered by the financial institution is affordable
	Quality/relevance
QTY1	The savings product provided by the financial institution suits our needs
QTY2	The loan product provided by the financial institution suits our needs
QTY3	The payment services provided by the financial institution suits our needs
QTY4	The savings product provided by the financial institution is safe for us
QTY5	The loan product provided the financial institution is safe for us
QTY6	The payment services provided by the financial institution is safe for us
QTY7	The saving product provided by the financial institution satisfies us
QTY8	The loan product provided by the financial institution satisfies us
QTY9	The payment services provided by the financial institution satisfies us
QTY10	The saving product provided by the financial institution is useful to us
QTY11	The loan products provided by the financial institution is useful to us
QTY12	The payment services provided by the financial institution is useful to us
	Usage
USG1	The cost of making a trip to the financial institution is low
USG2	The paper work requirements by the financial institution is favourable
USG3	The fees charged by the financial institution on use of its services are favourable
USG4	The level of service provision by the financial institution is very good
USG5	The financial institution always provide its services on regular basis
USG6	The financial institution always provide its financial services at convenient hours
USG7	Members of this household trust financial products and services offered by the financial institution
USG8	The products and services provided by the financial institution are user friendly
USG9	The process of getting financial services from the financial institution is easy
USG10	It takes us less time to reach the financial institution to get the services
USG11	The interest on deposit services offered by the financial institution is attractive for us
USG12	The terms set by the financial institutions on use of its products and services are favourable to us
USG13	The financial institution used by this household member is conveniently located
USG14	The terms of repayment of loans provided by the financial institution is favourable to us
	Welfare
WEL1	The products/services provided by the financial institution has improved our standard of living
WEL2	The products/services provided by the financial institution has increased our income
WEL3	The products/services provided by the financial institution has enabled us acquire more assets
WEL4	The products/services provided by the financial institution has led to improved literacy in this household
WEL5	The products/services provided by the financial institution has led to increased consumption in this household
WEL6	The products/services offered by the financial institution has provided self-employment to this household members
WEL7	The products/services provided by the financial institution has improved our access to health services
WEL8	The products/services provided by the financial institution has improved our housing condition
WEL9	The products/services provided by the financial institution has improved our access to amenities
WEL10	The products/services provided by the financial institution has improved our access to utilities

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