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The relationship between complexity behavior and enterprise growth: A case of savings and credit cooperatives in Uganda

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Abstract: This study examines the relationship between complexity behavior and enterprise growth in savings and credit cooperatives (SACCOs) in Uganda. A cross-sectional survey was conducted in the four regions of Uganda, using a mixed method approach. Primary data was collected using a self-administered questionnaire from 269 SACCOs in Uganda. Zero-order correlation, regression analysis, and structural equation modeling techniques were used to analyze the data. The study findings indicate a positive and significant relationship between complexity behavior and enterprise growth in SACCOs in Uganda. Furthermore, the dimensions of complexity behavior (self-organizing, adaptive behavior, and networking) are found to be positively and significantly correlated with enterprise growth in SACCOs in Uganda. This research focuses on the role of complexity behavior in promoting enterprise growth in a developing economy.

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The paper results will enhance our teaching and research knowledge in financial cooperatives as University lecturers in finance, microfinance, banking and management.

PUBLIC INTEREST STATEMENT

The growth of savings and credit cooperatives (SACCOs) is very paramount in promoting employment, wealth creation, innovation, and development of the economy. However, SACCOs experience slow growth in their life span due to financial and non-financial barriers, which adversely affect the growth over time. Therefore, in practice, managers should endeavor to be creative and self-organizing during routine activities beyond the SACCO norms. In the same vein, SACCOs should create linkages with other stakeholders to share ideas/information relevant for the growth of SACCO. SACCOs should adopt modern technologies and adjust their operational strategies to address the competitive pressures and changes in the business environment. Therefore, the study underscores the importance of self-organizing, networking, and coping mechanisms in the growth of SACCOs.

Subjects: Economics; Finance; Business, Management and Accounting

Keywords: enterprise growth; complexity behavior; adaptive behavior; self-organizing; and networking

1. Introduction

According to Machado (2016), growth of small and medium enterprises (SMEs) is a very important phenomenon that fosters their survival and competitiveness. This growth drives innovations, creates employment opportunities, and generates income in the economy (Akingunola, 2011; Kasekende & Opendo, 2003; Koech, 2011). However, empirical evidence suggests that SMEs experience slow growth over time, a phenomenon associated with financial and institutional barriers (Davidsson, Achtenhagen, & Naldi, 2010; Mckelvies & Wiklund, 2010, Muthaih & Venkatesh, 2012). Theoretically, growth as a function of complexity behavior is rooted in the complexity theory (Goldstein, 1999; McMillian, 2008); however, this contradicts earlier studies on enterprise growth that are anchored on the business life cycle model, resource-based view, and dynamic capabilities theories (Zhang, 2010; Adizes, 1979; Penrose, 1959; Rostow, 1960). According to the complexity theory, enterprises growth is associated with the response and adaption to dynamic changes in the business environment.

According to Nuwagaba (2012), savings and credit cooperatives (SACCOs) are informal/formal financial intermediaries that focus on socioeconomic well-being of their members generally and are formed to promote the economic interests in communities. These financial intermediaries are member-owned, member-managed, member-used, and member-controlled. According to the CGAP Annual Report (2005), SACCOs are user-owned financial intermediaries with members who typically share a "common bond" based on geographic area, employer, community, or other affiliation and have equal voting rights. In their practice, their operations are guided by the established international cooperative movement principles and values set by the International Cooperative Alliance.

Indeed, they have positioned themselves as potentials for increased production, productivity, and value addition in the economy (National Planning Authority, 2015) and continue to significantly impact on reducing poverty and social exclusion and promoting rural and national development (Ministry of Trade, Industry and Cooperatives [MTIC], 2016). The Ugandan government is committed to promoting their growth and development through various interventions directly by the line Ministry of Trade, Industry and Cooperatives (MTIC, 2016) and also through donor assistance (RFSP and Profira Projects 2008–2019). Despite these interventions, available information reveals a slow growth in their life span (Bwana & Mwakujonga, 2013), hence putting their remarkable contribution to socioeconomic development of African economies in contention. Specifically, the SACCO growth has generally remained poor even though the government and other stakeholders are addressing the competence and governance challenges in Uganda (Ssekakubo, Ndiwalana., & Lwanga, 2014). For instance, the savings, share capital, membership, incomes, and returns to members have remained low in SACCOs (World Council of Credit Unions Statistcial Report, 2016). The success factors for the growth of enterprises are rooted in the complexity behavior constructs of self-organizing, networks, and coping mechanisms. Put in Uganda context, these SACCOs have registered slow growth as manifested in limited ability to self-organize their systems, processes, and staff to create innovative practices that foster their growth. The networking activities among the SACCO staff and other stakeholders are weak, which have limited the formulation of innovative and productive synergies needed to promote the growth of SACCOs. In addition, SACCOs are not equipped with adequate adaptive strategies, such as flexibility of interest rates to match with the changes in the dynamic business environment. This paper is motivated by the need to study the global variable enterprise growth in the semi-financial sector and to examine the extent to which the growth of SACCOs in Uganda is a function of complexity behavior. The current study examines the relationship between

complexity behavior and enterprise growth of SACCOs using a mixed research design. The rest of the paper is structured as follows: it begins with an understanding of the SACCOs in Uganda; Section 2 is the literature review, followed by methodology and results and concludes with the discussion section.

1.1. Savings and credit cooperative organizations in Uganda

This section provides an overview of the SACCO as a unit of study in this paper. SACCOs are financial institutions/cooperatives formed by a group of people with common interest to achieve common goals and socioeconomic welfare of the members. In Uganda, a government agency, the Ministry of Trade, Industry and Cooperatives is charged with the oversight and coordination role of SACCOs besides other Apex agencies like the Uganda Savings and Credit Cooperative Union and Uganda Cooperative Alliance that foster self-regulation and coordination. The operations of these institutions are anchored legally in the Cooperative Statute (1991) cap 112, the Cooperatives Regulations Act (1992), and the Microfinance Tier 4 & Moneylenders Act (2016). These financial cooperatives can make bylaws as the supplementary legal frameworks from which to draw their mandate to operate and serve the members.

Currently, Uganda has 8285 registered SACCOs, but according to the World Council of Credit Unions Statistcial Report (2016), only 2064 SACCOs are actively operational and submit annual performance reports to (MTIC, 2016). Those that are dormant do not exhibit any evidence of functionality and have weak governance and management structures, inadequate liquidity, and high attrition rates. These challenges among others have adversely affected their growth trajectory over time.

2. Literature review and hypothesis development

This section of the paper attempts to explore the relationship between complexity behavior and enterprise growth in existing literature. Indeed, extant literature shows that there is a positive relationship between complexity behavior and enterprise growth. However, the review has established that it is marked with noticeable weaknesses as discussed below.

2.1. Complexity behavior and enterprise growth concepts

Scholars have conceptualized enterprise growth from a quantity perspective where an increase in quantity is embodied in the extension of enterprise scale, sales volume, market share, production value, profit, and employee. In contrast, the quality perspective encompasses the enhancement of enterprise in respect to the technological innovations, optimal efficiency of the investment/output, the organizational innovation, and reform (Achtenhagen, Naldi, & Melin, 2010; Mao, 2009; Tao, Hong, & Sun, 2004). Therefore, in the context of this study, enterprise growth is conceptualized as a change in the capital base, portfolio quality, membership, and returns to members of the informal financial intermediaries over time.

2.2. Complexity behavior

Convey (2003) describes complexity behavior as the study of behavior of large collections of simple and interacting units that are endowed with the potential to evolve with time (Barrett, 2011). Marion and Uhl-Bien (2001) contribute to the concept of complexity behavior as arising from complexly interacting systems and it is characterized by creativity, learning, and adaptability features (Marion, 2008). Indeed, McMillian (2008) while emphasizing what other scholars posit added the dimensions of self-organizing, co-evolving, and emergent phenomena. We domesticated this concept of complexity behavior of the semi-informal financial intermediaries in the business environment, especially the SACCOs because they are comprised of many members and they function through interaction and providing feedback characteristics of complexity.

2.3. Complexity behavior and enterprise growth

Hong, Lu, and Huang (2015) in their work establish a relationship between cooperation development and the growth of organizational complexity. They argue that when an organization is in the

infant stage, it is highly complex, is likely to perform and grow better. This assertion implies that complexity behaviour in organizations is related to enterprise growth and can explain the growth of financial institutions given the complexities arising from handling increasing membership over time. However, Hong et al. (2015) focused more on corporate performance than growth and adopted a quantitative lens in the focus.

In addition, El-Ghalayini (2017) suggested that complexity theory deals with organizational systems change and the complexities which arise when different parts of the organizational system interact. Arising from the aforementioned review, we deduce that interactions between the organization and its environment are very vital in contributing to its survival and growth. This analogy applies to SACCOs that also interact with their eco-system in the course of their operation which may contribute to their growth over time. However, El-Ghalayini's (2017) studies expounded more on the interactions within the organization and its environment. This current study upholds the concepts of interaction and growth in a semi-financial sector. To the contrary, the current study investigates the relationship between complexity behavior and enterprise growth in the financial cooperatives. In line with the above literature, *the hypothesis is as follows:*

H1: There is a positive significant relationship between complexity behavior and enterprise growth.

2.3.1. Self-organizing and enterprise growth

According to Geerlof and van Beckhoven (2016), the complexity behavior dimensions of self-organization and self-management are crucial to contemporary organizational growth. They argue that self-organizing leads to understanding the right leadership necessary for organizational growth and development as well as facilitating the growth of enterprises. The gap is that Geerlof and van Beckhoven (2016) concentrate on the role of self-organizing in facilitating enterprise growth in isolation of other dimensions of complexity behavior such as networking and adaptive behavior. This study departs from this approach and considers the role of all the dimensions of complexity behavior in explaining enterprise growth.

In addition, Gandolfo and Vasja (2016) argue that organizational change occurs as a result of the move to adapt to the changes in the various global and international business environments. It should be recalled that organizational change is considerate of growth, and in this perspective, it is reflected as a consequence of adaptive behavior. To this extent, growth of business is functionally related to adaptive behavior of the business. However, while this is true, adaptive behavior is primarily one of the elements of complexity behavior, together with self-organizing and networking. This means that while there is a contribution made by Gandolfo and Vasja (2016) to the explanation of enterprise growth, the construct complexity behavior was not studied in totality. This is what the current study attempts to address and therefore we hypothesize as follows:

H1a: There is a positive and significant association between self-organizing behavior and enterprise growth.

2.3.2. Networking and enterprise growth

Another dimension of complexity behavior is networking, and indeed, studies of governance and growth of SACCOs in Uganda have been undertaken by Kyazze, Nkote, and Wakaisuka-Isingoma (2017). The central argument is that networking promotes interaction and bonding of the committee members in the process of ratifying and approving SACCO laws, policies, and budgets. Networking builds positive interests and shared norms, which in turn lead to trust and mutual understanding of the members. Similarly, Okello, Munene, Ntayi and Nabeta (2016) point to the critical role of networking in promoting the sharing of resources and information among the poor households in Uganda. This paper argues that complexity behavior is based on networking as a component and relates to enterprise growth in the case of SACCOs. Additionally, these studies

dwell so much into the role of networking in fostering the growth of businesses, which is inconsiderate of the totality of the construct complexity behavior.

Recently, Baltaci and Ali (2017) posit that the complex systems from which complexity emanates as social networks composed of interactive employees interconnected through collaborative, dynamic ties, such as shared goals, perspectives, and needs. The collaborative effort contributes to improving the organizational performance and growth. This contention is paramount in explaining the collaborative efforts in operations of financial cooperative, which is applied to networking alongside other complexity behavior dimensions. *Therefore, the hypothesis is as follows:*

H1b: There is a positive and significant association between networking and enterprise growth.

2.3.3. Adaptive behavior and enterprise growth

Goldstein, Hazy, and Lichtenstein (2010) propose a new dimension that complexity helps to explain why organizations are able to adapt, change, and grow. What emerges from this is that enterprise growth manifests in emergent phenomenon from complexity behavior tendencies of self-organizing, interaction, and adaptive behavior in dynamical complex phenomena, Gupta and Anand (2015) suggested that complexity adaptive systems are self-organizing and learn to adapt to changes in the environment. They add that constituents of a complex system interact locally among themselves, and this leads to reshaping and renewal of the system as a whole as a spontaneous adaptation to changes in the external environment. Likewise, Wilson (2017) highlighted the value of self-organization and adaptation among individuals in organizations. Relatedly, self-organization, interaction, and learning are very important in the growth of SACCOs in an ever-changing business environment. However, Gupta and Anand (2015) provided insights into complexity theory. However the currrent study examines the relationship between complexity behavior and enterprise growth based on mixed research design. Furthermore, McMillan (2008) also underscores the value of learning in complex adaptive systems that aid the adaptation process as organizations adjust to changes in the environment. In the same vein, Holland and Powell (1998) and McMillan (2008) suggested that emergence is the phenomenon of the process of adapting and transforming to change in complexity circumstance. Hence, the foregone literature helps to explain the self-organized and adaptive attributes of financial cooperatives in the ever-changing business environment by learning from past experiences and other stakeholders in the SACCO industry. However, McMillan (2008) and Holland and Powell (1998) were more inclined to the explanation of the concept of complexity in management in a dynamic environment. While, the current study examines the association between adaptive behavior and enterprise growth in financial cooperatives over time. In view of the reviewed literature, *the study hypothesis is as follows*:

H1c: There is a positive significant association between adaptive behaviour and enterprise growth of SACCOs.

3. Methodology

3.1. Research design and sampling

The study adopted a mixed research approach to collect both quantitative and qualitative data (Creswell, 2009). The data collection process followed a sequential triangulation approach to ensure reliability and validity of the data (Yeasmin & Rahman, 2012).

The population of the study was 2065 registered and active SACCOs in Uganda (The Uganda Cooperative Alliance Performance Report, 2015), from which a sample of 335 SACCOs was determined based on Yamane (1973) sample size determination formula. The unit of analysis for the study is the registered and active SACCOs that regularly reported their performance indicators with the Registrar

of Cooperatives in Uganda. The unit of inquiry comprised of managers, credit officers, accountants, and board members, whereby three respondents were selected from each sampled SACCO using purposive sampling technique. These selected respondents perform specific roles and responsibilities in the governance and management of financial intermediaries as supported by (Creswell, 2009).

Quantitative data was collected in the period between May and June 2017 and thereafter qualitative data was gathered in July 2017.For the qualitative data for this study, the sample was nine senior managers. The saturation point was reached after interviewing the ninth person as guided by DiCicco-Bloom and Crabtree (2006) that at the saturation point, any additional interviews lead to no new findings. Hence, after nine respondents, there was no new information gained by the researcher but rather the repetition rate was nearing 100% hence the stopping of the exercise.

The authors observed the ethical code by obtaining a letter of consent from the line Ministry of Trade, Industry and Cooperatives to undertake the study. The research assistants were inducted through the study instruments so as to use simple and clear language. The research instruments were serialized and coded to conceal the identity of the respondents for confidentiality purposes.

As is the practice, the study adopted the conventional measures of the variables that included the following: complexity behavior measurement items were adopted and modified for self-organization, networking, and adaptive attributes of complex adaptive systems (Gershenson & Fernandez, 2012; McMillan, 2008; Walker, Holling, Carpenter, & Kinzig, 2004). Meanwhile, for networking, the measures were based on the (Hart & Martinez, 2006) network survey metric measurement scale. They identified centrality, betweenness centrality, closeness centrality, reciprocity, and transitivity as quantifiable dimensions for social networks that were adopted and modified to fit the study measurements. The measurement items for enterprise growth were adopted from Anyadike-Danes, Bonner, Hart, and Mason (2009) that measure growth in terms of change in business income, business volumes, profitability, employment, and investment (Asset capital) levels. In addition, Gupta, Guha, and Krishnaswami's (2013) measure of growth of a firm in terms of change in revenue generation, value addition and expansion in terms of volume of business, as well as the qualitative features like market position, quality of products, and goodwill of the customers were selectively adopted and modified for the study.

Validity and reliability of the instrument; the study used content validity index (CVI) to validate the measurement items for the study variables and the question items were modified based on the expert comments. For complexity behavior, the CVI was 0.87, while for enterprise growth, it was 0.82, which according to Amin (2005) was above the recommended 0.70 as being good and hence the instrument was appropriate for the study. The study performed Cronbach's co-efficient (Cronbach, 1951) to test the reliability of the instrument for internal consistency in the measurement of complexity behavior and enterprise growth. The reliability results showed that complexity behavior had α coefficient of 0.866 while the enterprise growth had α coefficient of 0.852. Since both were above the acceptable reliability α co-efficient of 0.7, it signified a high reliability of the instrument in line with the recommendation by Nunnally (1978) and Sarantako (2012).

The study also tested for the reliability and validity of the qualitative data instrument based on Miles and Huberman's (1994) quality of qualitative research criteria of conformability, credibility, transferability, and dependability. The key informants were interviewed for 30–40 minutes to ensure all the necessary data was gathered from them. The interview notes and voices as well as the transcribed scripts were reviewed to check for the correctness and completeness of the data. The study also followed a specific procedure in the coding and analysis of qualitative responses. The researchers were able to provide full explanation and account of all the ideas, records of observations, and responses presented on each occasion of the interview process through self-participation in the interview process. The qualitative data was analyzed using content analysis based on created thematic areasguided by the study constructs and dimensions.

For data management, the returned field data instruments were coded and data was checked for completeness, consistency, and accuracy of responses before data entry process into SPSS version 22. In consonance with Mafabi, Munene, and Ntayi (2012), the missing values were identified and managed not to adversely affect the multivariate analysis. The missing values analysis tested for the extent and pattern of missingness whether the data was missing completely at random (Field, 2009; Pallant, 2005). The Little Mcar test was used to test whether the data was missing completely at random, and the statistical results indicated a significance value (.046) less than .05, which was within acceptable range for remedial action. Consequently, the missing values were replaced using the linear interpolation method (Field, 2009; Little & Rubin, 2002). The descriptive statistical results for the outliers were evident in both the control and quantitative variables. The z-score analysis and square root transformation methods were used to correct the outliers.

The study also controlled for common method bias, to avoid inflation or deflation of observed relationships between constructs so as to eliminate type I and type II errors in our study (Lamoureux, Pallant, Pesudovs, Hassell, & Keeffe, 2006).We carefully constructed items of the study; by defining ambiguous/unfamiliar terms, vague concepts were removed, keeping questions simple, specific, and concise, avoiding double-barrelled questions, decomposing questions into simpler and more focused questions (Tourangea, Rips & Rasinsiki, 2000).

Further diagnostic tests were carried out to check whether the data fulfilled the parametric assumptions of normal distribution, homogeneity of variance, and multi-collinearity. The parametric test results show that the data was normally distributed, stable variant, and free from the risk of multi-collinearity between the complexity behavior dimensions. To determine whether the distribution as a whole deviated from a comparable normal distribution in the study data, the Kolmogorov–Smirnov and Shapiro–Wilk tests were carried out. The results indicate that all items had values non-significant at $P > .05$, implying that the data was normally distributed and suitable for a further statistical test as the assumption of normality was met.

In addition, the Levene's test was carried out to test the hypothesis that the variances in the groups were equal and the difference between the variances was zero. The results show the Levene's test for all the variables is non–significant at $P > .05$ (complexity behavior $P = .934$ and enterprise growth $P = .485$) and the variances were stable at all levels. This means that the data was good for further statistical tests as the assumption of homogeneity of variances was achieved and tenable.

Exploratory factor analysis (EFA) was performed to test for factor loading on each of the study constructs (Hair, Black, Babin, & Anderson, 2010). The EFA results of the study indicated the factor items loaded well on the constructs of complexity behavior and enterprise growth with communality value above 0.5. Further, confirmatory factor analysis was carried out to test whether the dimensions of a theoretically grounded model of variables fitted in the study data based on model fit indices (Williams, Onsman, & Brown, 2010), to confirm whether the factors extracted converged as manifest variables of the latent variables. The results in Figure 1 show the complexity behavior measurement model fit indices; Incremental Fit Index (IFI) = .980; Tucker–Lewis Index (TLI) = .969; Comparative Fit Index (CFI) = .979 and Root Mean Square Error of Approximation (RMSEA) = .029. Figure 2 shows the enterprise growth measurement model fit indices; IFI = .986; TLI = .977; CFI = .985 and RMSEA = .030. The model fit indices were all above the threshold of .95 and the RMSEA were less than the 0.05 cutoff point implying the retained items explained well the latent variables.

In this paper, descriptive statistics describe the demographic and sample characteristics of the SACCOs studied while Pearson correlation analysis establishes the association between complexity behavior components of self-organizing, networking, adaptive behavior, and enterprise growth.

Figure 1. Complexity behavior measurement model.

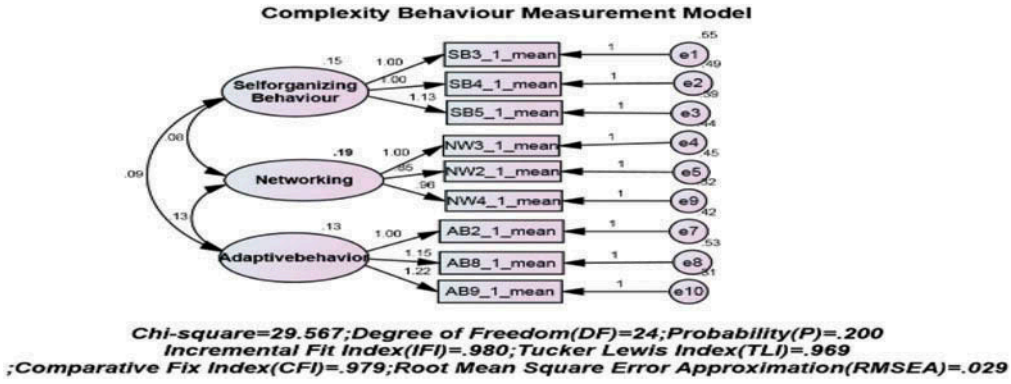
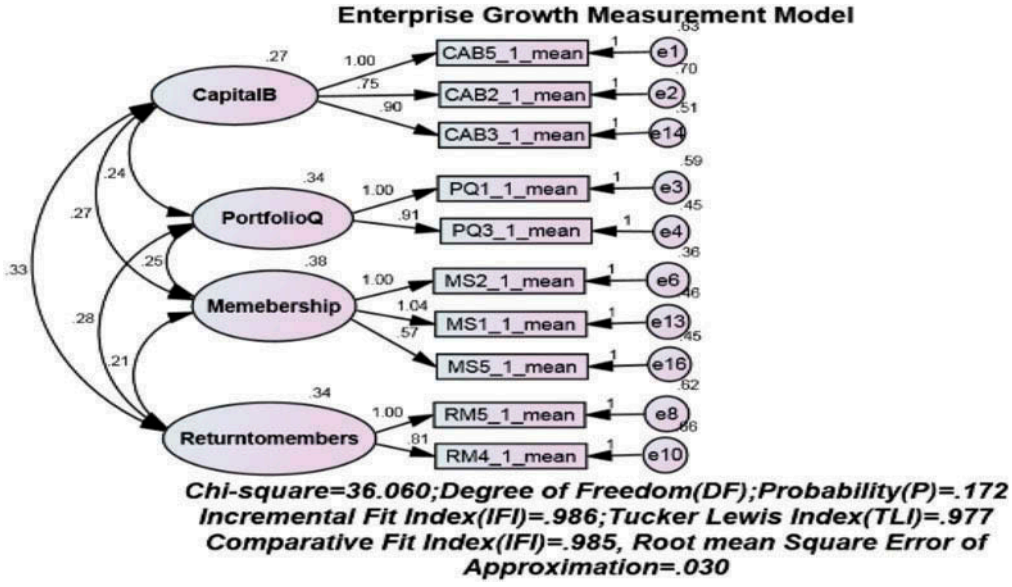


Figure 2. Enterprise growth measurement model.

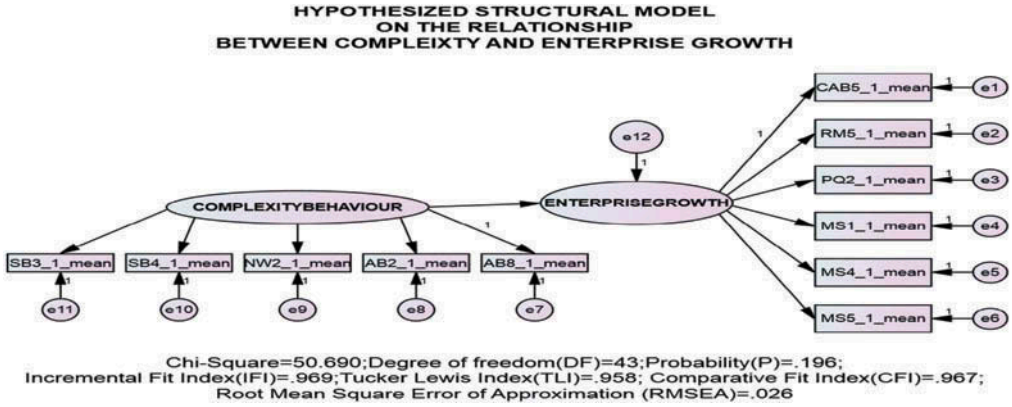


The linear regression is to determine the predictive power of complexity behavior on enterprise growth. Finally, we perform a structural equation model (Figure 3) to test the study hypothesis (H_1) showing the relationship between complexity behavior and enterprise growth.

4. Results

The descriptive organizational statistics show that a majority (39%) of the SACCOs were located in urban areas while the peri-urban and rural areas were each at 30.5% implying there is over-concentration of SACCOs in towns and trading centers. The majority 61% of the selected SACCOs had been operational for more than 5 years implying that this period is adequate to witness enterprise growth. The results also show that 25% of the SACCOs sampled had over 1000 members and 66.5% between 50 and 1000 members. Since they are member-led and managed institutions, the increase in the membership implies the growing complex nature and hence complexity behavior. In terms of the total accumulated savings, 59.1% of the sampled SACCOs had saved less than 100 million Uganda shillings and only 21.9% had saved over 500 million Uganda shillings. From a loan portfolio angle, 78% of the SACCOs had extended loans between 50 and 500 million Uganda shillings to their members. When the savings and loan portfolio are taken together, the implication is that these financial intermediaries a really experience sizable growth and hence the justification for the study.

Figure 3. Structural model.



For the interviews, the respondents comprised of three managers, three credit officers, and three board members. Their age ranged between 28 and 50 years with the board members falling in the upper age bracket of between 44 and 50 years and the credit officers in the lower bracket of 28–35 years. The age factor is crucial in designating the key actors in a SACCO with the more mature members playing the governance role and the younger members placed in operational functions. The respondents had diverse qualifications ranging from certificate to master's level, which explain their competence and productivity potentials that may contribute to the growth of SACCOs.

4.1. Correlation and regression analyses

Pearson zero-order correlation analysis is performed to determine the association between the complexity behavior components and enterprise growth. The results in Table 1 indicate that each of the complexity behavior components of self-organizing, adaptive behavior, and networking are positively and significantly associated to enterprise growth of SACCOs (self-organizing r = .247, P < 0.01; adaptive behavior r = .528, P < 0.01 and networking r = .797, P < 0.01). However, self-organizing behavior has a weak association with enterprise growth, unlike adaptive behavior and networking that posted a strong association. Overall, the findings show that there is a positive and significant relationship between complexity behavior and enterprise growth of SACCOs (complexity behavior r = .638, P < 0.01). In essence, the study results indicate that a positive change in complexity behavior is highly associated with a positive change in enterprise growth of SACCOs.

The linear regression analysis is performed to determine the explanatory power of complexity behavior on the enterprise growth model. Table 2 presents the linear regression results showing a positive and significant relationship between complexity behavior and enterprise growth (P value < .05). The adjusted R^2 (.404) indicates that complexity behavior explains 40.4% of the change in enterprise growth of SACCOs. The probability of the statistics (F-statistics = 182.900, P = 0.000 < .05) shows that the model is perfectly fitted, implying complexity behavior significantly explains enterprise growth of SACCOs in Uganda.

Table 1. Zero-order Pearson correlation

	CB	SOB	AB	NET	EG
Complexity behavior (CB)	1.000				
Self-organizing behavior (SOB)	.811**	1.000			
Adaptive behaviour (AB)	.754**	399**	1.000		
Networking (NET)	.734**	.311**	.469**	1.000	
Enterprise growth (EG)	.638**	.247**	.528**	.797**	1.000

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

Table 2. Linear regression

	Unstandardized coefficients beta	Std. error	Standardized coefficients beta	t	Sig.	R^2	Adjusted R^2	*F*-statistic	Sig.
Constant	1.999	.139		14.435	.000	.407	.404	182.900	0.000
Complexity behavior	.496	.037	.638	13.524	.000				

Table 3. Standardized regression estimates

	Estimate (*β*)	Standard Error(SE)	Critical Ratio(CR)	*Probability (P)*
Enterprise growth – complexity behavior	0.781	.306	4.059	.000

The standard regression estimates were established as $\beta = 0.781$; SE = .306; $t = 4.059$; $P = .000$), implying that there is a positive association between complexity behavior and enterprise growth, P value < .05 in Table 3. Therefore, a positive change in complexity behavior contributes to a positive change in enterprise growth.

The structural equation model in Figure 3 tested the relationship between complexity behavior and enterprise growth. The results show that the model fitted well as indicated by the model fit indices of the baseline comparisons indices, which are above .95 thresholds recommended by Hair et al. (2010); chi-square = 50.690; degree of freedom (DF) = 43; probability (*P*) = .196; IFI) = .969; TLI = .958; CFI = .967, and the RMSEA = .026 which falls within the recommended statistical value of less than .05.

5. Discussion and conclusion

This study objective was to examine the relationship between complexity behavior and enterprise growth of financial cooperatives in Uganda. The discussion of the results is guided by the complexity behavior components of self-organizing, networking, and adaptive behavior. Cases of the qualitative responses to support the quantitative findings in the discussion are provided. In addition, empirical and theoretical evidence is provided to vindicate findings discussed in the following.

Self-organizing behavior instills creativity and innovativeness in SACCO management, which in turn produce better strategies that foster the mobilization of more members, savings, incomes, and assets of SACCOs. For example, creative and innovative SACCO staff form self-created groups while conducting their routine operations. The self-created groups help them to combine their efforts and ideas for effective operations, hence the SACCOs realize more members, savings, capital, and loan volumes because of the extra innovative practices of the staff beyond organizational requirements as vindicated by the response of one credit officer: “In our SACCO we work in self-created teams during field activities like member mobilization and loan recovery. This has helped us combine efforts and ideas to convince more members join the SACCO and induce the borrowers pay back loans in time”.

The study revealed that the credit officers on their personal discretion use social media platforms to market the different financial products to their members. Therefore, self-organizing tendencies in SACCO management help the staff integrate their efforts to develop better approaches of conducting their routine activities, thereby contributing to growth in savings, capital, incomes, and assets. The study findings are supported by previous studies that underscored the significance of self-organizing behavior in the leadership and management of contemporary organizational development in the complex adaptive environment (Geerlof & van Beckhoven, 2016; Heylighen, 2016). The SACCO self-organizing attributes are rooted in the complexity behavior theory (McMillan, 2008; Marion 1999) that proposes self-organization processes in a complex adaptive system. Therefore, self-organizing attributes among the SACCO members are very significant in contributing to the emergent phenomenon in SACCOs, manifested by growth in capital base, incomes, membership and improvement in portfolio quality over time.

The results of this study of networking attributes and enterprise growth were supported implying that the managers and credit officers interact, exchange, and share information in their operations. In the course of collaborating and interacting with one another, good innovative ideas and methods on how to mobilize more members, savings, loans, capital, and incomes are generated. Furthermore,

in the process of product design and development, there is consultation and sharing of information about the right products to develop in order to attract more members to access the various services offered.

These findings are consistent with extant literature on the importance of networking in the governance and management of microfinance institutions in Uganda and Mexico (Adriana & Maria, 2016; Okello, et al 2016). The study results lend support to the complexity theory that emphasizes the interaction and evolvement of multiple units in complex dynamical adaptive systems (McMillan, 2008).

The results show that adaptive attributes are very paramount in semi-formal financial institutions like SACCOs since they operate in a dynamic environment. *They can* cope with the changes in the business environment by adjusting the policies and technology. Indeed, in Uganda, SACCOs match their credit policies to members by the changes of the central bank and commercial banks. For example, when the commercial banks reduce or increase their lending rates, the SACCOs match these actions in order to remain competitive in the marketplace. Hence, sustaining an affordable interest rate levied to members enables the SACCOs to remain attractive and preferred by the members contributing to the growth in membership, savings, and loan portfolio volumes.

Therefore, when SACCOs are armed with adaptive attributes in their operations, they are likely to attract more savings, incomes, capital, and members. The above practical discussion is supported by a myriad of empirical literature that highlights the value of adaptive behavior characterized by self-organizing and learning in complex adaptive systems (Gupta & Anand, 2015; McMillan, 2008; Wilson, 2017). The results support the complexity theory standpoint (Goldstein et.al., 2010; McMillan, 2008), who theorized institutions as multiple units with adaptive behavior that leads to an emergent phenomenon in a dynamic environment. Therefore, adaptive attributes are very important in coping with the ever-changing business environment conditions of SACCOs in Uganda.

In conclusion, firstly, the study makes a significant contribution by domesticating complexity theory in the study of enterprise growth in the semi-formal financial sector. The results of the study confirm that self-organizing attributes contribute to enterprise growth of SACCOs, and therefore, it is important that financial cooperatives recognize these attributes for their efficient and profitable sustainability in the business. Secondly, the study findings also prove that networking of SACCO staff and other stakeholders is instrumental in the operations of the financial cooperatives because through networks they can build synergies, rationalize their operations, and foster their growth. Lastly, adaptive behavior is crucial for financial cooperatives since the changing environment in which they operate requires a timely and planned reaction. This can only be attained if they embrace adaptive approaches to sustain enterprise growth of SACCOs.

From a policy and managerial perspective, SACCO management should always redesign and readjust their operational strategies to address competitive pressures and changes in the market through constant reviews of policies and rationalization of operations. In addition, they should create a climate that encourages interaction and exchange of innovations ideas and creates a platform.

The research has a few limitations. The first is that it was a cross-sectional research design and so it was difficult to trace the long-run behavior changes in enterprise growth of SACCOs. Yet, the reports of the Registrar of Cooperatives in Uganda indicate that many SACCOs are highly volatile in their performance as revealed by the sizable number of dormant SACCOs that did not comprise this sample. Secondly, much of the extant literature on enterprise growth was founded on the conventional business firms with less focus on the financial sector and SACCOs, posing a challenge of cross-validation of the study findings. Future studies should adopt a longitudinal design to control for the dormancy factor of SACCOs and should be conducted elsewhere in the world to confirm the similarity in the results.

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