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## **Market Complexity: Navigating the Dynamics of a Complex Market Environment by Commercial Banks in Less Developed Markets**

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### ***Abstract:***

*The complexity in the marketplace has increased many folds in recent years and related decision making also has got complex by the day. In this paper, we explore the basis up on which commercial banks in less developed markets deal with complex market environment. We find that commercial banks use a combination of mechanism to both reduce and absorb market complexity. Specifically, interdependence and interaction quality rank very high among the response strategies used by commercial banks with reference to Uganda, a less developed market in Africa.*

***Keywords:*** *Less developed markets, complexity, commercial banks*

### **1. Introduction**

The environment within which businesses operate in the less developed markets presents a challenging phenomenon like never before. At the heart of this challenge is the outcome of the globalization pressures, a brain child of the western market. Firms operating in these markets hitherto find themselves at cross-roads where they have to compete with the more developed and well-established standards set by their counterparts from the developed markets even in their home markets. The injustices for businesses in this market is that globalization advocates for an open system of doing business of which they are not yet prepared for irrespective of the advanced movement supporting it.

Organizational theorists (Anderson, 1999) identify open system of organization in the market place with complexity as a key component of the modern system. However, developments in the market system for less developed markets have not had a similar path when compared to that of the more developed markets. Developments in commercial banking has been vaguely characterized by continuous change, notably in pricing and product development (Don *et al.*, 2016) and even in market moves and countermoves (D'Aveni, 1994; Eisenhart and Tabrizi, 1995). At the global level, commercial banks' ability to change continuously is becoming a critical success factor. This continuous change is often played out through product innovation as banks change and ultimately even transform through continuously altering their products.

This study examines how commercial banks in Uganda are navigating the complexity trend in the market. A few cases of continuous change for banking in Uganda took pace with Centenary Rural Development Bank a local commercial bank evolving from primarily serving the rural market to a bank that also caters for the corporate world and the evolution of Housing Finance Company Limited that was limited to dealing with mortgages to a commercial bank. This complexity with which firms undergo continuous change has not been properly explored and understood. For example, despite the centrality of the issue of bank complexity, there seems to be no shared consensus just yet on what complexity might mean in the context of banking, or at least what might be agreed-upon dimensions to focus on in relation to complexity (Cetorelli and Goldberg, 2014).

The Ugandan commercial banking industry however, has been through considerable up and downhill trend. Prior to Uganda's independence in 1962, government-owned institutions dominated most banking in the country. Whereas in 1970 there were a combined 290 bank branches in the country, by 1987 there were only 84 branches, of which 58 branches were operated by government-owned banks. The restructuring that occurred in the late 1990s and early 2000s focused on improving banking services, through liberalization and strengthening prudential regulations (Bategeka and Okumu, 2010) brought with it several challenges to many banks. This saw several banks declared insolvent, taken over by the central bank and eventually sold or liquidated. Stanbic Bank

the largest commercial bank currently in Uganda with 19% market share and 91 branches country wide emerged from a privatization sale of Uganda Commercial Bank to Standard Bank of South Africa and somehow provided some stability in banking. Following the regulatory changes initiated in 2007 a number of commercial banks were licensed in Uganda with the total number of commercial banks now at 25 and the combined number of branches at 564 and growing. The need for commercial banks to efficiently perform has thus never been greater especially with the increased rate of globalization, deregulation and disintegration.

## 2. Theoretical Argument

Existence in the commercial banking industry at the moment deserves a complexity science perspective as preempted by the number of closures, mergers and acquisitions. Complexity theory gives us an understanding of how system level adaptation to environmental change emerges from the actions of its agents (Anderson, 1999; Eisenhardt and Bhatia, 2002; Murphy and Gilpin, 2013). The perspective we advance here is that commercial banking is comprised of a unique operating system under a unique and yet partially connected agent (i.e., complex adaptive systems). The focus of this study is on how individual banks with unique, yet partially connected operations cope with the changing business environment that imitates what previous researches (Holland and Miller, 1991; Anderson, 1999; Cilliers, 2001; Gell-Mann, 2002) described as moderate connection and simple schemata in a complexity sense.

Complexity theory suggests that organizations as complex adaptive systems perceive a turbulent and complex environment and develop either a complexity absorption managerial response or a complexity reduction managerial response to their market environment (Anderson, 1999). More researches (Boisot and Child, 1999; Ashmos, Duchon and McDaniel Jr, 2000) have however provided a distinction between complexity absorption and complexity reduction but which have never been tested empirically in Ugandan commercial banks. The idea of complexity reduction is that an organization develops a simple, mechanistic operational strategy for the turbulent market environment thus developing a singular adaptive response. Organizations that attempt to reduce complexity emphasize codification (specifying categories to which data are assigned) and abstraction (limiting the number of categories that need to be considered in the first place) (Ashmos *et al.*, 2000; Floricel *et al.*, 2016). Navigating the dynamics of complex market environment based on codification and abstraction would include formalizing and centralizing banking operations and decision making, plus minimizing the number of interactions/connections for decision making. Commercial banks taking this approach would operate a system of seclusion with very minimal decisions made at the branch level and little interrelationships with other banks. This is an approach where commercial banks would try to minimize complexity in operations by having all decisions made at the head office only to be implemented at the branch level. This approach to navigating complexity has been challenged on grounds that it limits the variety organizations will have to offer, organizations will miss important data points, will over simplify their view of what is happening in the environment, and will generally be unable to respond to the high levels of variation among elements in the environment (Ashmos *et al.*, 2000). The complexity absorption view is more aligned to complexity theory (Capra, 1996; Stacey, 1995) and reflects a managerial view that organizations are complex adaptive systems and should address its environment as such with multiple and conflicting goods, a variety of strategic priorities, increased connectivity among people, as well as structural variety intended to maximize the flow of information and meaning in the organization. Indeed, complexity theory provides a multiplicity of alternatives to analyze the behaviour of organizations and how successful organizations can account for their success over and above the average player. As we know complexity theory gives us an understanding of organizations as complex adaptive systems. The belief that order will always emerge from every chaotic situation still resonates in both practice and academic mind. As researchers we still question how this order emerges, who is responsibility for bringing order and what is the likely cost of chaos? Byrne (1998) also argue that the application of complexity theory constitutes a defense of realism. Although the information presented in this paper is by no means conclusive on the agenda for complexity theory discussion, they are suggestive of the potential power of the theory as a guide to strategic approach to navigating turbulent market environment for commercial banks.

*Research proposition: Commercial banks perceiving a turbulent and complex market environment and which employs appropriate navigation strategies will outperform those that are less akin to market complexity.*

## 3. Methods

This study considered 21 commercial banks from a population of 25 banks in Ugandan, an East African country with a population of around 40 million people. It has a Gross Domestic Product (GDP) per capita of around \$750. The banking penetration stands at around 40% thanks to the new wave of mobile money services through the existing mobile telecommunication service providers, without it the penetration falls to around 20-30% of the adult population with active bank accounts. Eight large banks dominate around 75% of the total banking assets. Specifically, Stanbic Bank Uganda is the biggest bank in the country with around 19% market share and 91 branches. It is a member of the South African Standard Bank Group with over \$1.2bn in assets. Several important observations can be made about the 21 banks selected for this study. First these banks reflect the largest sample of the 25 banks from which they are drawn in terms of asset ownership, market share and number of branches. From the 21 banks where data was collected, 8 were of domestic origin and 13 were of foreign origin. The origin of the bank was considered based on where the bank was first licensed. We also considered the number of years the bank had been in operation in the Ugandan market. This gave us an indication of the knowledge and experience in the market. This is presented (Table 1) below as the description of the unit of analysis. From these 21 banks, we targeted. Data was collected using in-depth interviews and self-administered questionnaires. Interviews targeted marketing executives at headquarters and a maximum saturation point of 15 interviews was realized. Questionnaires targeted branch managers from the overall branch population of 564. Using Yamane (1967), a sample size of 234 was arrived at and a response rate of 83% (195) was achieved (Table 2) as indicated below. Three groups of employees filled and returned the questionnaire one each from a branch, viz

banking officers (20%), supervisors (47%) and managers (32%). Although the target was the manager at the branch, some managers were relatively new in the position and preferred to give the most experienced banking officer at the time or the supervisor. In terms of gender, the respondents were fairly balanced but with slight majority of the male population (51%). The level of education was quite high with only respondent with a diploma and majority with bachelor degree (79%). However, we note that majority of the respondents had been with respective banks for fairly short period of time with about less than 10 years' experience (92%)

<b>Origin of the bank</b>	<b>Frequency</b>
Domestic/Local	8
Foreign	13
Total	21
<b>Number of years the bank has been operational in Uganda</b>	<b>Frequency</b>
Less than 6 years	1
6-10 years	3
11-15 years	1
16-20 years	4
Above 20 years	12
Total	21

Table 1: Description of unit of analysis

<b>Position in the Bank</b>	<b>Frequency</b>	<b>Percent</b>
Banking Officer	39	20
Supervisor	92	47.2
Manager	64	32.8
<b>Respondent Gender</b>		
Male	100	51.3
Female	95	48.7
<b>Respondent highest level of education</b>		
Diploma	1	0.5
Degree	155	79.5
Postgraduate degree	39	20
<b>Number of years the respondent has worked with the bank</b>		
Less than 2 years	21	10.8
2-4 years	53	27.2
5-7 years	67	34.4
8-10 years	39	20
Over 10 years	15	7.7
Total	195	100

Table 2: Description of unit of inquiry

#### 4. Results

To establish the complexity strategies used by these commercial banks, we conducted Exploratory Factor Analysis and validated the results with analysis of responses from the in-depth interviews. The results from the Factor Analysis produced (KMO=0.793; Bartlett's Test: -Chi-Square=2741.802, df=351, Sig.=0.000, % of variance=73.716%; Cronbach alpha=0.815) eight (8) strategies being used in commercial banking for dealing market complexity as indicated (Table 3&4) below.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.793
Bartlett's Test of Sphericity	Approx. Chi-Square	2741.802
	Df	351
	Sig.	.000
Cronbach Alpha		.815

Table 3: KMO and Bartlett's test for market complexity dimensions

The 8 factors produced were named (Table 2) as: 1 = connectivity/interrelationships; 2 = Interdependence/interaction quality; 3 = Co-evolution; 4 = Market disequilibrium; 5 = Market flexibility/non-linearity; 6 = Feedback; 7 = Self-organization; and 8 = Emergent behaviour.

S/N	Items	Component							
		1	2	3	4	5	6	7	8
1	Typically bank staff tell clients something personal about themselves	.847							
2	Typically, staff discuss with clients matters pertaining to their personality	.825							
3	When dealing with client's staff discuss what they do for work	.811							
4	When dealing with client's staff tell appropriate jokes	.795							
5	Typically, employees of the bank discuss with client's personal likes and dislikes	.792							
6	When dealing with clients we ask about their health	.756							
7	We are appreciative and thankful to our clients		.819						
8	In the bank, we have the necessary skills to perform our job		.804						
9	in the banks, we always have knowledge to answer client questions		.787						
10	In the banks, we are never too busy to respond to client requests		.773						
11	We listen carefully to what our clients have to say		.754						
12	The banking sector promotes joint efforts in product design			.851					
13	The banking sector promotes joint product development			.819					
14	The banking sector promotes joint participation in quality control			.816					
15	The banking sector promotes sharing service delivery systems			.800					
16	The only time we receive feedback from the market is during performance reviews				.863				
17	The market is always unpredictable when we directly engage them				.858				
18	When we seek information the market we don't get it right away				.798				
19	For those occasions when our performance falls below what is expected the market let us know					.851			
20	On those occasions when the bank makes a mistake we are told about it					.842			
21	Our market tells us when our performance does not meet market standards					.758			
22	We get information about eventual opportunities and threats						.865		
23	We can rely on information we gather to detect customers' needs in terms of services, promotions and other marketing mix						.856		
24	Our market let us know when we do a good job in the market							.850	
25	When we do a good job in the market, our market praises us							.828	
26	The banking system in Uganda perform cooperative and connected activities within the system								.830
27	The banking system in Uganda manages its own disputes								.804
	% of Variance	15.451	12.632	11.014	8.833	8.220	6.086	5.842	5.637
	Cumulative %	15.451	28.083	39.098	47.931	56.151	62.237	68.080	73.716
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. a. Rotation converged in 6 iterations.									

Table 4: Principle component analysis

The zero-order correlations (Table 5) below indicate that the factors are independent of each other and thus not closely related to cause concerns of multi-collinearity.

	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>
Connectivity (1)	1							
Interdependence (2)	-.131	1						
Co-evolution (3)	-.133	.326**	1					
Market disequilibrium (4)	.420**	-.133	-.034	1				
Market flexibility (5)	.202**	.163*	.120	.158*	1			
Feedback (6)	-.016	.262**	.206**	-.056	.173*	1		
Self-organization (7)	.044	.239**	.020	-.047	.332**	.108	1	
Emergent behaviour (8)	.101	.299**	.366**	.083	.272**	.315**	.156*	1

\*\* . Correlation is significant at the 0.01 level (2-tailed).  
 \* . Correlation is significant at the 0.05 level (2-tailed).

Table 5: Zero order correlations for market complexity dimensions

To provide a comprehensive description of the individual strategy, we used descriptive statistics (mean, mode, standard deviation, median) and in line with Field (2009) considered the mean to give an indication of the most common strategy being applied (Table6). The results are then corroborated with views from in-depth interviews. The mean scores generated generally indicate high support of the variables. The most common strategy for dealing with market complexity identified as interdependence and interaction quality (mean = 4.38, std. dev. = .530), followed by self-organization (M = 4.16, SD = .547), navigating market disequilibrium (M = 4.14, SD = .528), co-evolution (M = 4.12, SD = .715), navigation of market nonlinearity (M = 4.09, SD = .565), emergent behavior (M = 4.04, SD = .686), feedback (M = 3.59, SD .857), and connectivity/interrelationship (M = 3.51, SD = .981).

	N		Mean	Std. Er. of Mean	Median	Mode	Std. Dev.	Var.	Range	Min	Max
	Valid	Missing									
Connectivity/interrelationship	195	0	3.51	.070	3.86	4	.981	.963	4	1	5
Interdependence	195	0	4.38	.038	4.33	5	.530	.280	4	1	5
Co-evolution	195	0	4.12	.051	4.00	4	.715	.511	4	1	5
Market disequilibrium	195	0	4.14	.038	4.20	4	.528	.278	3	2	5
Market flexibility	195	0	4.09	.040	4.00	4	.565	.320	4	1	5
Feedback	195	0	3.59	.061	4.00	4	.857	.734	4	1	5
Self-organization	195	0	4.16	.039	4.00	4	.547	.299	3	2	5
Emergent behaviour	195	0	4.04	.049	4.00	4	.686	.470	4	2	5

Table 6: Descriptive statistics

4.1. Interdependence and Interaction Quality

Interdependence refers to the mutual reliance on each other between two or more groups or persons. Interdependence theory is concerned with how individuals in relationships influence each other and the nature of their interaction in obtaining valued outcomes (Rusbult and Lange, 2003). A review of this theory is however out of the context of this study. Our interest in reflection of the theory is to give us a general perspective of the role of interdependence in the relationship between the agents in commercial banking environment. Interdependence for commercial banks is exhibited where banks are emotionally, economically, ecologically and morally reliant on and responsible for each other in doing business. “With other banks in terms of doing business we rely on each other a lot.” This is happening a lot in different circumstances “for example, when we have to expect payments coming from another bank, or sometimes when a customer is getting money from the other bank or when we are the ones getting money from another bank it is actually a cordial working relationship.”

4.2. Emergence and self-organizing behavior

Emergent behavior in banking refers to the ideology that market changes and practices arise from the interactive practice developed by a group of banks rather than actions of a single bank. This means that developments in one bank unless it spreads to other banks will not drive the market. Complex adaptive systems theories presume that the adaptation of a system to its environment emerges from the adaptive efforts of individual agents that attempt to improve their own payoffs (Anderson, 1999). As Holland and Miller (1991) observed, changes emerge from actions of individuals at the most basic levels and may spread to the whole industry. Likewise, self-organization emerges as a result of the interdependent behavior of individuals who act on local information to create understanding among themselves (Anderson, 1999). When interactions remain with a delicate range, can prevent stagnation and decay on the one hand, and unpredictable, random dynamics on the other (Kaufman, 1993; Davis and Rabinowitz, 2007). The business environment for that matter is comprised of a set of relationships between agents or stakeholders in the environment, whereby the relationships are changed by the individual decisions taken. These interactions continuously “co-create” the environment. The presence of self-organization and emergence occurring through a loose coupling of participants in the environment to describe complexity in the business environment is not new (Achrol, 1991; Peltoniemi and Vuori, 2004; Helbing, and Rauhut, 2011). By working to reduce

information asymmetries within the sector, subsidizing process investment, support exchange negotiations, rewarding agents for improving efficiency, jointly offering significant rewards for successful innovation and competence creation, and organizing business services, agent make the internal quasi-market more efficient than external markets, but still allow multiple businesses to come together “naturally”. Helbing, and Rauhut (2011) supports this argument noting that the constant repositioning of entities and relationships within a complex system supports the postmodern view of a multiplicity of localized yet networked, social and political discourses.

#### 4.3. Interrelationship/Connectivity

Interrelationship relates to the manner in which banks and agents relate to the customers and other stakeholders in the industry and what they expect to gain from it. “When we know who a customer is, then we are able to give them specific relationships and products that do answer to their needs.” As a result, many banks establish specific programmes to use on each of the customer groups. Additionally, banks also have special relationships amongst themselves. “The relationship we have with other banks I would say is actually very good because they are not exactly competitors”. “At the moment, the relationship context is that banks look at other banks as partners in the business environment.” Notwithstanding, the need for good interrelationships in commercial banking is currently of increased importance. “For starters, commercial banks are involved in transfer of funds and even buying of clients, while in some cases there are other transactions that may require understanding between banks that may have significant ramification for customer satisfaction and sales growth.” “We may not have ATM roll in one of our ATMs but the other nearby bank has, if we have good relationship with the bank we are able to refer the customer there.” Adaptation to market complexity is known to significantly explain customer experience in online shopping environments (Bilgihan, Kandampully and Zhang, 2016). It would also seem that extended interactions between a bank and the customer have through interaction channels have now integrated into a unified online customer experience, and completely have a positive influence on customer decision-making process and long-term relationship creation and maintenance as observed in literature (Wilson, 1995). Previous studies have as well tried to establish the link between connectivity, customer satisfaction and customer loyalty. Rose *et al.* (2011) proposed and theoretically concluded that repurchase intention is one of the outstanding consequences of enhanced online customer experience. Like Anderson (1999) we find that the environment that organizations face is characterized by many interactions among organizations and institutions creating complex nonlinear relationships between actions and market performance outcomes. D’Aveni (1994) describes such environments within which we place commercial banks in this study as hypercompetitive. While Geer-Frazier (2014) noted that essentially such nonlinearity leads to both unpredictable behavior and rapid rate of change, because changes in one agent’s behaviours reverberate to influence other in a chain reaction. What is seen in banking at the moment is that developments in systems and products in one bank will generate a need for innovation in all the banks to catch up.

#### 4.4. Information and Technology Sharing and co-evolution

This study finds that the issues identified with information and technology sharing and co-evolution that are relevant for market performance outcomes in commercial banks relate to: situations when banks promote joint efforts in product design; when banks promote joint efforts in product development; when banks promote joint participation in quality control; and when banks promote sharing service delivery systems. In theory, this means that when banks undertake joint activities, they should have higher performance outcomes. However, with discussion from the managers we also came to the conclusion that because of the secretive and confidential nature of information held by banks, information sharing poses significant difficulties. Melville *et al.* (2004) recognized that the interchange of information, whether subtle or concrete, forms the basis of all organizational activity. “There are specific lines of information that we share.” In most cases, information sharing is limited to those that do not reveal the internal strategies used in the bank. These are information that aid business transaction outside the bank like in the clearing house, to comply with regulatory requirements, the bank would share information where instructions have been issued by each other’s customer, the banks would also share information especially where they are transacting with each other but this is limited to services level agreements for contracts between the banks as supervised by the regulator. “Banks would come together only where they have common interest to share information.” But otherwise banking is a very confidential business where banks do not freely and for no reason come up to share information. Between the bank and the clients, again there is some degree of information sharing but with limitations as was mention by one manager, “for example with a borrowing client, there is some information that the bank may be compelled to share, and that is not for any selfish reason, but it is for being able to the correct analysis.” This therefore means that banks that do not sufficiently develop and update their information system find it difficult to adapt to complex market situations and certainly will have an effect on its market performance.

Technology sharing is also an aspect that was identified in adaptation to market complexity and that has an effect on market performance. This becomes important and it is likely to affect performance outcomes because technologies are used to transact almost all businesses within and across the banks. Technology sharing therefore is inevitable in banking. This was reported by one manager, that “this applies to technologies like VISA and other technological advancements or whatever is in the market out there, that are used by a group of banks.” For banks in developing economies like Uganda, technology is always borrowed rather than developed. As was mentioned by one manager, “this will have also been tested elsewhere and the adaptability is ascertained to be sure that whatever is being presented to the market will not create any disturbance.” Certainly, the banks in developing economies face a lot challenges in adaptation to market complexity when it comes to technology sharing. In most cases these technologies are controlled in the international market as was observed, “for card services like VISA, they are managed by the cards association and they are responsible for any upgrade; the cards association takes control of the whole business, points of sale and policy where necessary; generally all

transactions connected with cards crossing banks is regulated by the cards association, so whichever portfolio you are bringing in has got a regulator component that makes it adapt to the market.”

Co-evolution describes the extent to which changes instituted or developed in one bank will affect or initiate similar changes in other banks or in the industry as a whole. Co-evolution becomes very important in the sense that a bank either absorbs what other banks have come up with or it risks becoming obsolete in its operations. More so, the importance of co-evolution has been properly documented in literature (White et al., 1997; Volberda, and Lewin, 2003). Porter and Tesiberg (2006) situate co-evolution at the heart of three key theories Systems theory (Scott, 1992), ecological organization theory (Clippinger, 1999; Baum and Singh, 1994), and complexity theory (Kauffman, 1993). Since agents co-evolve with one another (Holland and Miller, 1991; Levinthal, 1997), the processes and structures that emerge from their interactions are dynamic and not static (Anderson, 1999). “As banks, we are partners in the market and competitors to each other”. “At the end of the day, if one bank focuses on improving themselves or the community to household level, then it is incumbent upon others in the market also to be addressing the same thing. Co-evolution in many circles requires collaborations (Eisenhardt and Galunic, 2000). The process involves the routines by which managers reconnect webs of collaborations among various parts of the firm to generate new and synergistic resource combinations among businesses. Eisenhardt and Brown (1998) identified the concept of patching in co-evolution and defined it as a strategic process that centers on routines to realign the match-up of business (i.e., add, combine, and split) and their related resources to changing market opportunities.

#### 4.5. Communication and Feedback

Communication represents the complex mechanisms through which banks inform the market of their offerings. While feedback is the process in which a bank monitors its activities by seeking for information or results about its marketing offer. A general view put forward by complexity theorists is that instability in systems results in positive-feedback processes dominating to bring about change, and new or novel forms of order emerge (Mitleton-Kelly, 1998; Prigogine and Stengers, 1984). “For example, if I am looking at a young customer, I know the trend has moved to social media.” “I also know that there is a group that doesn’t do social media, they are glued to their television sets.” “Then there is a group that basically you find only in meetings, they don’t have time for radios, the only time they have for radios is in their car.” The challenge with communication and feedback for commercial banks lies on how the bulk of this information is received and filtered. The use of the traditional postal address which was somehow efficient in past has been discouraged at the moment yet the online means does not have sufficient reach. Several banks have set up call centers but this is not known to many customers. Other mechanisms include the suggestion boxes, face-to-face engagement and social media. Communication is recognized as important for innovation even in literature. Communication is essential to innovation teams, without it, no team could perform in a way, so a certain minimum frequency of communication is necessary (Cohen and Bailey, 1997).

### 5. Discussion and Conclusion

Commercial banks are actually complex adaptive systems that continuously self-organize and evolve. This is how they are conditioned in order to remain relevant in a market driven by environmental turbulence and complexity. Even Goldstein (1999) stated that there is a similar refrain about how properties, qualities, or patterns of global or macro dynamics are not able to be predicted from knowledge of the components or antecedent conditions alone. The unpredictability of the complex systems such as that operated by the commercial banks certainly makes it difficult to concentrate on any one principle for complex adaptive systems. For example, what is unpredictable in emergent phenomena may not be their most interesting facets. The current wave of internet banking may not be a key driver in banking in the next few years. Predictability is about having the right product, at the right time for the right people. The earlier suggestion of complexity theorists that systems are vital and creative when they are at the edge of chaos, i.e. in a state that includes both order and disorder (Prigogine, 1984) may be misleading and too expensive for commercial banks to rely on. Not with the fragile business environment in which Ugandan commercial banks are operating in at the moment. Notably an occurrence in the market where one of the top five banks recently collapsed after consistent years of being locally recognized as the best performing market in the market. Indeed, survival of commercial banks is highly dependent on interactions of many agents but unlike suggested by complexity theorists (Anderson, 1999) that interactions of many agents at multiple levels following simple rules, here agents follow strict rules as dictated by the stakeholders. In this sense therefore, strategic organizations emerge from highly structured interaction requiring much connectivity, interdependence and co-evolution. Indeed, commercial banks as complex adaptive systems operate in a highly sensitive manner to their environments and respond to these environments, co-evolving with them as seen by different programmes targeting different stakeholders. We are in agreement with the view that complex systems are, to a great extent, self-organizing and that the self-organization is the outcome of the interdependences among individual agents following their own set of rules (see Crozier and Thoenig, 1976). However, commercial banking involves highly secretive operation and managers were quick to point out to this effect, the ideas presented here presents a challenge for planning and the learning views to strategy, practice and implementation, which suggest a clear-cut approach to handling market complexity other than dependence on simple rules.

This empirical study however, gives valuable insight into how organizations and researchers can use complexity system’s understanding to look at the organizational phenomenon. Specifically, we present Ugandan commercial banks to operate in a complex environmental system that requires ardent adaptation strategies and tactics. We identify complexity principles with which organizations can use to navigate the complex environmental systems in a developing country. No doubt, accommodating these complexity principles present challenges to organizations but our view is that proper adjustments to these principles also present opportunities. Admittedly, when organizations see that they are operating a complex system, the strategic approach would definitely change from the traditional organization theory perspective that guides operations. The problems, challenges and even competition will still be the same, but new innovations will come up in response these challenges. For example, rather than trying to go it alone

when faced with organizational dilemma, organizations will try to co-evolve, emerge and self-organize. Recent developments have seen Ugandan commercial banks come together to form the Uganda Bankers' Association to coordinate their activities. Despite the evident contributions made by this study there are a number of factors that may limit generalizability of the findings. First, the study focus was commercial banking industry in Uganda. The inherent limitation here is that although Uganda might share similar economic conditions with other developing economies, there are marked differences in market characteristics that might dictate on how for example an institution adapts to market complexity. Secondly, the study may have suffered from some methodological limitations. In the first instance, the study uses a cross-sectional approach to gather data on behavioural aspects that has problems with generalizing results. Another methodological limitation is that data was collected from a small sample size. From a population of 25 commercial banks, data was collected from a sample of only 21 commercial banks. However, to ensure validity of the data, we used both quantitative and qualitative data that gave the study more insight from the combination of the two methods rather than relying on one by itself (Creswell, 2009). The other methodological limitation is that, the study combines two research paradigms one being subjectivism and the other being objectivism that may have suffered from paradigm incompatibility (Tashakkori and Teddlie, 2003). To mitigate this limitation, triangulation was used to increase the study accuracy and validity measures. We also acknowledge that there is no widespread agreement about what constitutes complexity and so the operationalization used will be subject to refinement. However, the information presented should be seen as encouraging further study using a complex systems approach.

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