



**Knowledge management orientation, market orientation,
innovation capability and supply chain resilience: a case of
manufacturing firms in Uganda.**

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PLAN 'A'

DECLARATION

I, **MAKEPU JOEL NGOBI** declare that the work presented in this research is my own original and unaided work. Any assistance that I have received has been duly acknowledged.

Signature.....

Date.....30/09/21.....

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APPROVAL

This is to certify that this dissertation was prepared under our guidance as academic supervisors and is now ready for submission.

Sign.......... Date.....30/07/2024.....

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Sign.......... Date.....1/10/2024.....

MR. KAYISE DENIS

DEDICATION

I dedicate this piece of work to my God, and family especially my beloved father Mr Mufuwa David Hudson and my dearest sister Ms Naisanga Prossy for both financial and spiritual support towards my education.

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My sincere gratitude and glorification is to my everlasting heavenly Father, my provider in time of need. This research would not have been complete without your unending guidance and unconditional love. Special and sincere thanks are bestowed to my supervisors Dr. Benjamin Tukamuhabwa and Mr. Denis Kayise for their consistent guidance in accomplishing this piece of work. Many thanks to Ms. Namuluta Khadija Ramadhan, Ms Nsooli Conny, Mr. Maali Herbert and Mr. Tanansi Isabirye for their timely advice and guidance on this study and academics. Many thanks to the management of Uganda Manufacturers Association for the assistance provided in accessing some information especially in these hard times.

God bless and reward you all.

LIST OF ACRONYMS

SCRES	Supply chain resilience
KM	Knowledge management
KMO	Knowledge management orientation
UMA	Uganda Manufacturers Association
SPSS	Statistical Package for Social Scientist
SMEs	Small and Medium Enterprises
COVID-19	Corona Virus Disease 2019

ABSTRACT

The purpose of this study was to examine the relationship between knowledge management orientation, market orientation, innovation capability and supply chain resilience in Ugandan manufacturing firms, specifically focusing on Kampala, Wakiso and Mukono districts. A quantitative cross-sectional survey was conducted using 195 manufacturing firms from a sample size of 242 firms. Data were collected using self-administered questionnaires that were hand delivered to the respondents. Overall, 440 usable questionnaires representing 80.5% response rate were collected for analysis.

The analysis of data involved descriptive statistics for demographics, correlations and regression analyses for answering the research questions in accordance with the set objectives. The results revealed positive and significant relationships between the following variables; knowledge management orientation and supply chain resilience, market orientation and supply chain resilience, knowledge management orientation and innovation capability, market orientation and innovation capability, market orientation and innovation capability, innovation capability and supply chain resilience. In further analysis, it was found that knowledge management orientation, market orientation and innovation capability account for up to 54.8% of the variance in supply chain resilience.

Based on the study findings, recommendations were advanced regarding the need to strengthen knowledge management orientation and market orientation to enhance innovation capability and subsequently build supply chain resilience in Ugandan manufacturing firms.

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CHAPTER ONE

1.0 Introduction

This chapter contains the background of the study, the problem statement, purpose of the study, research objectives, research questions, scope of the study, significance of the study, and the conceptual frame work.

1.1 Background to the study

The contemporary business arena is characterised by increasing global interconnectedness and interdependence, coupled with dynamic and turbulent operating environment (Tukamuhabwa et al., 2017). In addition, global competition has forced firms to adopt cost minimisation strategies such as lean manufacturing that leave the supply chain with no spare capacity to cater for contingences (Kahiluoto and Makinen, 2020). As a result, firms have experienced vulnerability and multiple supply chain threats ranging from manmade risks such as cyber-attacks to natural disasters (Karl et al., 2018). These disruptions have caused massive financial and operation losses to companies, with some experiencing total collapse as in the case of Erickson (Hendricks and Singhal, 2003). Previous researchers have argued that the best way of dealing with supply chain disruptions is building supply chain resilience (SCRES) (Ambulkar et al., 2015; Tukamuhabwa et al., 2017). Indeed, of recent there has been increased interest in the phenomenon of SCRES in both research and practice (Hohenstein et al., 2015). SCRES is concerned with a supply chain's readiness, effective response to and recovery from a disruption, returning to the previous level or, preferably, an even better level of operational performance (Hohenstein et al., 2015; Tukamuhabwa et al., 2015). Firms need to build resilience in their supply chains because not all risks are avoidable (Juttner and Maklan, 2011; Hohenstein et al., 2015) and it is well understood that supply chain risks are prevalent in both developed and developing countries. Nevertheless, the research emphasis on SCRES has

concentrated mainly in developed economies (Tukamuhabwa et al., 2017), although it is observed that developing countries are potentially more vulnerable to certain peculiar supply chain risks (Lakovou et al., 2007; Transparency International, 2013). This is further evident in Tukamuhabwa et al., (2017)'s research on SCRES of manufacturing firms in Uganda which found that many of the specific threats that impend resilience emanate from the embeddedness of firms in a developing country context of Uganda. These threats included cultural e.g. corruption, informal sector, unfair competition, product counterfeiting, dishonest (suppliers, customers and distributors); political e.g. political instabilities, national politics, weak legal system. For example, the Daily Monitor of Tuesday 4th, September (2018), reported that Uganda's effort to establish industries in several parts of the country is being threatened by supply constraints and disruptions such as shortage of raw materials, infrastructural bottlenecks such as relating to power and roads, corruption and mismanagement surrounding the procurement processes, especially in government entities. Further, the New vision of July 14th (2020) reported that as result of the supply chain disruptions caused by the Covid-19 outbreak, the production capacity of most manufacturing firms in the beverages sector fell by close to 40%. The research effort focused on resilience of Ugandan manufacturing firms' supply chains is justified given the fact that the manufacturing sector in Uganda lags behind services and agriculture in terms of contribution to GDP (World Bank Report, 2015). Yet, the growth and sustainability of manufacturing activities are associated with strong linkages and spill over effects necessary for national economic growth and development.

Prior researchers have acknowledged the role of knowledge management related resources in enabling SCRES (Xiang-yu and Xiang-yang, 2008; Ponomarov and Holcomb, 2009; Ponomarov, 2012; Tukamuhabwa et al., 2015). Knowledge management can be facilitated by a firm's knowledge management orientation (KMO). KMO refers to the degree to which a firm demonstrates behaviours of organized and systematic knowledge management implementation in terms of building on its existing knowledge, assimilating external knowledge within the

existing internal knowledge frame and being receptive to new knowledge (Wang et al., 2008). Another strategic orientation – market orientation – also facilitates the development of supply chain management and logistics strategies aimed at building SCRES (Karami et al., 2014). Market orientation refers to the ability of a firm towards creating superior value for its customers (Narver and Slater, 1990). According to Slater and Narver (1999), market orientation is composed of customer orientation, competitor orientation and inter-functional coordination. Several researchers have also acknowledged the positive influence of market orientation and KMO on innovation capability (Han et al., 1998; Low et al., 2007; Lin et al., 2010; Wang and Lin, 2013; Kmiecik and Michna, 2018; Sabahi and Parast, 2019).

Innovation is related to the new application of ideas, skills, methods, and knowledge that can impact an organisation's competitiveness and create distinctive capabilities (Andersson et al., 2008). Innovation capability helps firms to build resilience to disruptions (Kamalahmadi and Parast, 2016; Sabahi and Parast, 2019), and it plays a vital role in the survival and growth of enterprises (Francis and Bessant, 2005). Innovative capability can be conceptualised as product innovativeness, process innovativeness, market innovativeness, behavioural innovativeness and strategic innovativeness (Wang and Ahmed, 2004). It is stressed that a culture of innovation and having innovative individuals can facilitate an effective and immediate response to a supply chain disruption (Kamalahmadi and Parast, 2016) thereby facilitating SCRES.

1.2 Statement of the problem

Building SCRES for firms' survival and growth has been to the forefront of research and practice due to a surge in threats that cannot be completely avoided (Jüttner and Maklan, 2011; Hohenstein et al., 2015). However, the current research focus has been mainly in developed economies (Tukamuhabwa et al., 2017), despite the fact that developing countries which have been largely neglected are known to be more vulnerable to context specific supply chain risks

(Lakovou et al., 2007; Transparency International, 2013). Specifically, in the Ugandan setting, Tukamuhabwa et al., (2017) contended that certain threats to SCRES in manufacturing firms result from the embeddedness of such firms in a developing country context. Ugandan manufacturing firms are mainly Small and Medium Enterprises (SMEs) whereby SMEs account for 93.5% of all Ugandan business establishments (UMA, 2019). Eyaa and Ntayi, (2010) reported that the majority of SMEs in Uganda do not survive for at least five years of commencement due to supply chain failures, which signifies a deficiency in SCRES. Moreover, Tukamuhabwa et al., (2017) identifies various threats to SCRES in manufacturing firms in Uganda such as corruption, informal sector, unfair competition, product counterfeiting, dishonest supply network partners, political instabilities, product counterfeiting, national politics and a weak legal system. This undesirable situation of SCRES deficiency could be attributed to problematic strategic orientations regarding knowledge management, markets and innovation capability in manufacturing firms.

1.3 Purpose of the study

The study sought to examine the relationship between knowledge management orientation, market orientation, innovation capability and supply chain resilience in Ugandan manufacturing firms.

1.4 Research objectives

- i. To examine the relationship between knowledge management orientation and supply chain resilience in Ugandan manufacturing firms.
- ii. To examine the relationship between market orientation and supply chain resilience in Ugandan manufacturing firms.
- iii. To examine the relationship between knowledge management orientation and innovation capability in Ugandan manufacturing firms.

- iv. To examine the relationship market orientation and innovation capability in Ugandan manufacturing firms.
- v. To examine the relationship between innovation capability and supply chain resilience in Ugandan manufacturing firms.

1.5 Research questions

- i. What is the relationship between knowledge management orientation and supply chain resilience in Ugandan manufacturing firms?
- ii. What is the relationship between market orientation and supply chain resilience in Ugandan manufacturing firms?
- iii. What is the relationship between knowledge management orientation and innovation capability in Ugandan manufacturing firms?
- iv. What is the relationship between market orientation and innovation capability in Ugandan manufacturing firms?
- v. What is the relationship between innovation capability and supply chain resilience in Ugandan manufacturing firms?

1.6 Scope of the study

This covers the geographical, content and time scope of the study.

1.6.1 Geographical scope

The study was carried out in manufacturing firms located in Kampala, Wakiso and Mukono districts (central region). Relatively, the chosen areas house the biggest proportion of manufacturing firms in Uganda (UBOS report, 2010/2011).

1.6.2 Content scope

The study was confined to the relationship between knowledge management orientation, market orientation, innovation capability and supply chain resilience.

1.6.3 Time Scope

The study was conducted between October, 2020 and December, 2020.

1.7 Significance of the study

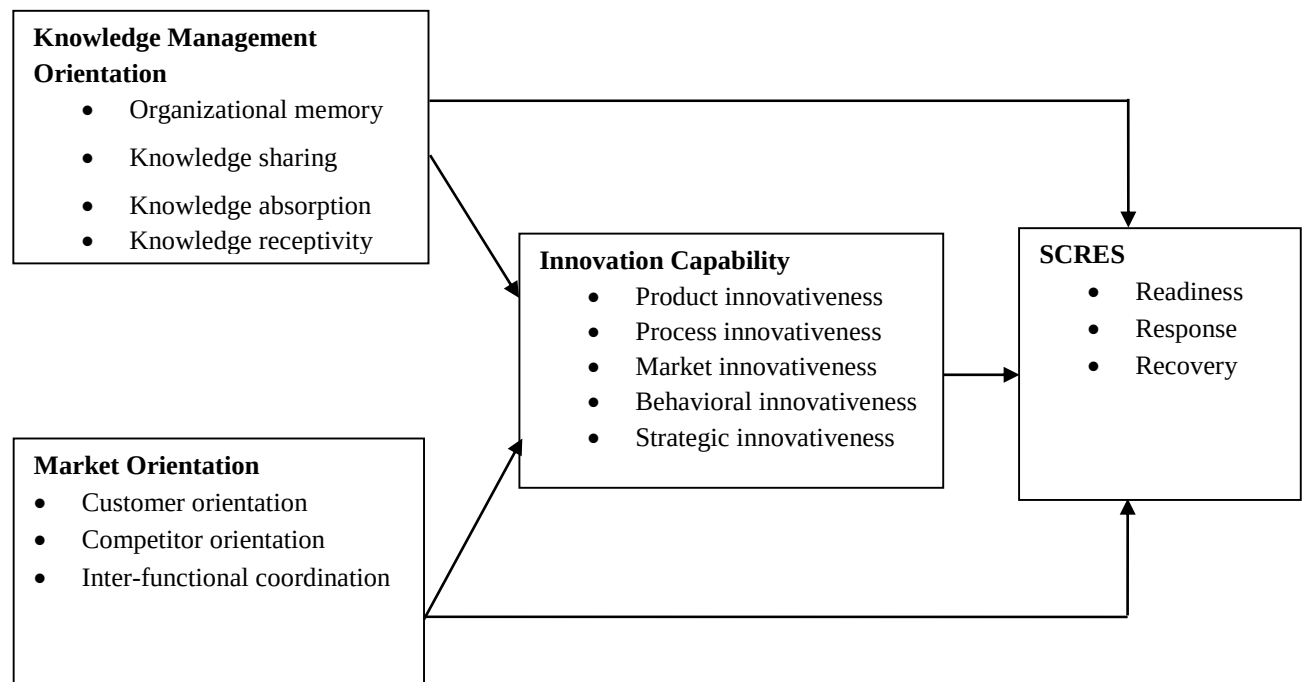
The study is relevant in several ways and to different stakeholders:

To the Manufacturing firms: This study may help manufacturing firms to improve on the supply chain resilience. The study is expected to reveal underlying causes of lack of supply chain resilience thereby providing insight to management on how these can be addressed and project success achieved. In this way, it will enable the management of these firms and other stakeholders to understand their role in ensuring longevity of the business through resilient supply chains.

To future researchers: The study is a resourceful material for academic research because it forms a basis for further research in project success by academia like researchers and students because it has not been widely studied in Uganda, yet it is a topic area of keen interest. The study provides a more up to date and richer source of debate into the subject matter, for the benefit of all stakeholders.

Policy makers: these include the government of Uganda and its agencies such as the various ministries. This study is expected to furnish them with more information on the importance of supply chain resilience, thereby arriving at enabling policy environments to achieve desired key outcomes through encouraging proper knowledge management, market orientation and innovation.

1.8 Conceptual framework



Source: Developed from reviewed literature (Wang et al., 2008; Liu et al., 2013; Wang and Ahmed, 2004; and Chowdhury and Quaddus, 2016).

1.8.1 Description of the model

The conceptual model suggests that both knowledge management orientation and market orientation are significantly and positively related to innovation capability. It is also proposed that each of the three variables positively associates with supply chain resilience.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter provides a review of literature relating to knowledge management orientation, market orientation, innovation capability and supply chain resilience. The chapter begins with the theoretical underpinning and goes on to explain the study variables and the relationships between them in accordance with the objectives of the study.

2.1 Theoretical review.

2.1.1 Dynamic capabilities theory

This study was underpinned by the dynamic capabilities theory which was proposed by Teece and Pisano (1994) as an extension of resource-based view of the firm (Barney, 1991). Teece et al., (1997) define dynamic capabilities as the ability of a firm to integrate, build, renew and reconfigure resources and competencies either internally or externally to adapt to the changing environment. According to Kwak et al., (2018), the premise of dynamic capabilities shares great similarities with the resilience capabilities. The dynamic capabilities notion is aligned with the need of a firm to have swiftness in adapting to change in the market environment in a disruptive market (Mihardjo and Rukmana, 2019). Capabilities are those distinctive competencies that consist of attributes, abilities, organizational processes, knowledge, and skills that allow a firm to achieve superior performance and sustained competitive advantage (Kwak et al., 2018). The notion of dynamic capabilities is also applicable to knowledge management orientation (KMO) in that dynamic capabilities are seen as integrated sets of knowledge management (KM) activities that changes, renews and exploits the knowledge-based resources of the firm (Nielsen, 2006). Nielsen (2006) further contends that dynamic capabilities create flows to and from the firms stock of knowledge-based resources. KMO

dynamic capabilities refer to an organization's ability to reconfigure its KM practices – that is, integrating them in novel, specific and flexible ways to develop new KM systems when required (Easterby-Smith et al., 2009). Despite the debate in the literature about the exact nature of market orientation as a capability of a firm (Menguc and Ash, 2006), scholars (e.g. Day, 1994; Hooley et al., 2005) revealed that market orientation has a positive relationship with a number of dynamic capabilities such as the customer-linking capability and the market-sensing capability. The notion of innovation is usually omitted in the discussion of dynamic capabilities (Lawson and Samson, 2001). However, as a key mechanism for organizational growth and renewal, innovation is implicitly central to the dynamic capabilities (Lawson and Samson, 2001) since the key traits of dynamic capabilities are entrepreneurial and innovative behaviour to achieve or attain competitive advantage (Teece and Pisano, 1994; Teece, 2007). Organizations possessing the innovation capability have the ability to integrate their key capabilities and resources to successfully stimulate innovation (Lawson and Samson, 2001).

2.2 Supply Chain Resilience (SCRES)

There are various definitions of SCRES available in literature (Christopher and Peck, 2004; Ponomarov and Holcomb, 2009; Pettit et al., 2011; Brandon-Jones et al., 2014; Tukamuhabwa et al., 2015; Tukamuhabwa et al., 2017). But most scholars seem to agree that SCRES is concerned with the supply chains readiness, response, recovery from the disruption and continuing operation at the normal or better state post disruption (Ponomarov and Holcomb, 2009; Shuai et al., 2011; Ponomarov, 2012; Xiao et al., 2012; Ponis and Koronis, 2012; Tukamuhabwa et al., 2015). Ponomarov and Holcomb (2009) defined SCRES as the adaptive capability of the supply chain to prepare for unexpected events, respond to disruptions, and recover from them by maintaining continuity of operations at the desired level of connectedness and control over structure and function. Consequently, resilience throughout supply chains recognizes both the ability to absorb shocks in the form of extreme events and the adaptive

capability to adjust to new circumstances (Brusset and Teller, 2017). For a supply chain to be resilient, it must be adaptable to disruptions and threats, as the desired state in many cases is different from the original one (Brusset and Teller, 2017). This adaptive capability (Christopher, 2005) allows the supply chain to recover after being disrupted, returning to its original state or achieving a more desirable state of supply chain operations (Tukamuhabwa et al., 2015).

Chowdhury and Quaddus (2016) measure SCRES along the dimensions of readiness, response and recovery covering both pre- and post-disruption stages of resilience. Supply chain readiness phase of SCRES emphasizes different preventive capabilities such as flexibility, redundancy, collaboration, visibility, market strength, financial strength, diversity and efficiency (Ponomarov and Holcomb, 2009; Pettit et al., 2011). Thus for supply chains to be ready, they need to forecast, identify risk, assess risk and monitor deviation, sensing the early warning signal to prepare for mitigating disruptions (Knemeyer et al., 2009; Pettit et al., 2011). Nevertheless, Tukamuhabwa et al., (2015) argued that proactive strategies like collaboration can as well be invoked in the aftermath of a disruption to facilitate the recovery phase of SCRES. Supply chain response, refers to the ability to respond quickly to a critical situation is an important determinant of SCRES (Sheffi and Rice, 2005; Wieland and Wallenburg, 2013). It can therefore be argued that organizations' ability to quickly respond to environmental forces, reconfigure resources and to recover quickly from vulnerabilities is an essential capability (Chowdhury and Quaddus, 2016). Supply chain recovery from a disruptive event should be within as minimum time as possible (Christopher and Peck, 2004; Sheffi and Rice, 2005; Ponomarov and Holcomb, 2009). Thus, resilience can also be assessed by the extent of recovery time, cost, absorption of disruption and ability to reduce the impact of loss which focuses on the post disruption capability of a system (Chowdhury and Quaddus, 2016).

2.3 Knowledge management orientation

Previous research has discussed the contribution of knowledge management (KM) and its related resources within supply chain field (Xiang-yu and Xiang-yang, 2008; Lim et al., 2017). It can be argued that effective supply chain management requires effective KM to achieve competitive advantage (Spekman et al., 2002). Though KM is centred on a firm's efforts to draw on individuals' collective knowledge in order to perform tasks (Wang et al., 2009), this leaves out the behavioural efforts of integrating achieved knowledge with the firms which gives rise to knowledge management orientation -KMO (Wang et al., 2009). KMO is defined by Wang et al., (2008) as the degree to which a firm demonstrates behaviours of organized and systematic KM implementation in terms of building on its existing knowledge (organizational memory) as well as sharing tacit knowledge (knowledge sharing), assimilating external knowledge within the existing, internal knowledge frame (knowledge absorption), and being receptive to new knowledge (knowledge receptivity). KMO is also the firm's relative propensity to build on its achieved wisdom as well as its propensity to share, assimilate, and be receptive to new wisdom (Wang et al., 2009). Wang et al., (2008) conceptualises KMO using; organisational memory, knowledge sharing, knowledge absorption, and knowledge receptivity. Organizational memory refers to the achieved knowledge which is learned from previous experience that can be brought to bear on decisions (Moorman and Miner, 1997). Knowledge sharing is often referred to as the transfer of wisdom, skills, and technology between organizational subunits (Tsai, 2002). The essence of knowledge sharing is to mobilize knowledge, given that effective KMO initiatives require a constant flow of wisdom, not just a stock of it (Holtshouse, 1998). Knowledge absorption; this refers to a firm's ability to recognize the value of new wisdom, assimilate it, and apply it (Cohen and Levinthal, 1990). According to Van den Bosch et al (1999) knowledge absorption has two processes which are knowledge exploration (one that focuses on the detection and acquisition of new wisdom) and knowledge exploitation (which emphasizes the utilization of existing wisdom). Knowledge receptivity

concerns the ease with which new ideas are taken up inside a firm. Davenport et al., (1998) argue that people must have a positive disposition to new knowledge if knowledge is to become effectively integrated in the firm's operations.

2.4 Market orientation

Much of the literature on the market orientation (MO) construct is often attributed to the contribution by Kohli and Jaworski, 1990; Narver and Slater 1990; Ottesen and Gronhaug, 2002). Kohli and Jaworski (1990) define MO as the organization wide generation of market intelligence or information pertaining to current and future customer needs, dissemination of the information across departments, and organization wide responsiveness to this information. Narver and Slater (1990) and Liu et al., (2013), refer to MO as an organizational culture comprising of three behavioural components of equal importance: customer orientation, competitor orientation, and inter-functional coordination. Customer orientation represents an emphasis on the sufficient understanding of one's target buyers, and competitor orientation focuses on the understanding of the short-term strengths and weaknesses and long-term capabilities and strategies of both the key current and potential competitors (Naver and Slater, 1990). Inter-functional coordination refers to the coordination of firm resources and customer-related activities throughout the whole firm (Zhou et al., 2009). MO is a specific firm-level resource that facilitates firms to sense marketplace requirements and to leverage the value of other capabilities that connect firms to external networks (Hsieh et al., 2008; Liu et al., 2013). It should be noted that market-oriented cultures are necessary to build and maintain core capabilities that continuously create superior customer value (Slater and Narver, 1994; Tan et al., 2014).

2.5 Innovation capability

Innovation, innovation capacity and innovation capability are terms that appear in much of the innovation literature and are interchangeably used by different researchers (Hogan et al., 2011). Several researchers have recognised the importance innovation capability towards the success

of a firm and its customers (Lawson and Samson, 2001; Ngo and O'Cass, 2009; Agarwal and Selen, 2009). Consequently, the ability to innovate provides a strong basis for firms to obtain and sustain superior performance and competitive advantage (Barney, 1991; Day, 1994). Although innovation capability has been defined and interpreted by different researchers, Ngo and O'Cass (2009) and Hogan et al., (2011) claim to provide a comprehensive understanding of the concept by defining innovation capability as a firm's ability, relative to its competitors, to apply the collective knowledge, skills, and resources to innovation activities relating to new products, processes, services, or management, marketing or work organization systems, in order to create added value for the firm or its stakeholders. Thus, an organization's innovation capability arises from the skills and abilities that enable the application of resources, and reflects an ability to continuously transform knowledge and ideas into new products, processes and systems for the benefit of the firm and its stakeholders (Lawson and Samson, 2001).

Generally, innovation can occur within processes, products, services, organizational structures, and management strategies (Flint et al., 2008). Wang and Ahmed (2004) developed the dimensions of innovation capability as follows; Product innovativeness; is defined as the novelty and meaningfulness of new products introduced to the market at a timely fashion (Wang and Ahmed, 2004). Market innovativeness refers to the newness of approaches that companies adopt to enter and exploit the targeted market. This means that a company can enter a market, identify a new market niche and launch products with cutting-edge technological content (Ali et al., 1995; Wang and Ahmed, 2004). Process innovativeness refers to the innovative capability that captures the introduction of new production methods, new management approaches, and new technology that can be used to improve production and management processes (Wang and Ahmed, 2004). Francis and Bessant (2005) contend that process innovation can be facilitated by systematic analysis and by comparative benchmarking through process mapping, activity analysis, constraints analysis, kaizen, problem analysis, video recording, modelling, time compression, statistical analysis, pilot experimentation,

process management and problem-solving and analysis. Thus, process innovativeness is imperative in overall innovative capability, in that an organisation's ability to exploit their resources and capabilities, and most importantly, the ability to recombine and reconfigure its resources and capabilities to meet the requirement of creative production is critical to organisational success (Wang and Ahmed, 2004). Behavioural innovativeness is demonstrated through individuals, teams and management and enables the formation of an innovative culture, the overall internal receptivity to new ideas and innovation. Behavioural innovativeness is a fundamental factor that underlines innovative outcomes in firms (Wang and Ahmed, 2004). Strategic innovativeness is "a fundamental reconceptualization of what the business is all about that, in turn, leads to a dramatically different way of playing the game in an existing business. In a broad sense, strategic innovation takes place when a company identifies gaps in industry positioning, goes after them, and the gaps grow to become the new mass market (Markides, 1998). Innovation is necessary for firms to respond to rapid changes in products and services as well as customer's demand and problems (Christopher, 2005; Kim et al., 2015; Kwak et al., 2018).

2.6 Knowledge management orientation and SCRES

There is growing interest on the role of knowledge management (KM) practices in the field of supply chain management (Cantor et al., 2014). In a supply chain, the effective use of KM practices is critical to effectively plan and forecast for future operations (Desouza et al., 2003). This forecasting is important for crafting proactive strategies necessary for SCRES. It has been argued that KM resources are considered as key enabling factors for SCRES (Xiang-yu and Xiang-yang, 2008). Chuang (2004) argued that social KM resources can facilitate knowledge sharing and cooperative innovation in supply chains (Chuang, 2004). And innovation has been acknowledged as a facilitator of SCRES (Golgeci and Ponomarov, 2013). Knowledge sharing helps in increasing a firm's resiliency in case of supply chain disruptions (Datta et al., 2007;

Soni et al., 2014). Christopher and Peck (2004) recommend the creation of a supply chain community in which information is exchanged among members of the supply chain as a way of reducing risks in the supply chain. Soni et al., (2014) and Sabahi and Parast (2019) consider internal and external sharing of knowledge as two precursors of resilience in large firms. This is because information and knowledge sharing improve the ability of any system to manage future disruptions i.e. before, during and after the incident (Soni and Jain, 2011). Scholten and Schilder (2015) consider joint knowledge creation as an enhancer of SCRES via increased visibility, velocity and flexibility but this collaboration can only happen when each firm (supply chain member) gets relevant information productively and electively (Mandal, 2012). Thus, investment in information sharing can help to identify potential threats in a supply chain (Melnik et al., 2014) and can positively influence on a firm's responsiveness to the external environment (Craighead et al., 2009). Thus, we propose the following hypothesis.

H1. Knowledge management orientation is positively associated with supply chain management.

2.7 Market orientation and SCRES

Previous research has increasingly recognized the significance of MO in supply chains (Sanzo et al., 2003; Min et al., 2007; Tukamuhabwa, 2011). Green et al., (2006) contend that a firm's market orientation can affect firm performance by influencing its supply chain management. Min and Mentzer (2000) argue that adoption of a market orientation at the supply chain level is pivotal to the overall success of the supply chain. This is because market-oriented firms are more likely to realize the strategic importance of managing the supply chain when operating under conditions of high environmental munificence, dynamism, and complexity (Gligor, 2014). Complexity has been underlined as a resilience influencing factor in supply chains (Brandon-Jones et al., 2014). Mandal and Saravana (2019) found that although MO influences supply chain agility, which has been considered a SCRES capability (e.g. Juttner and Maklan,

2011), it did not influence tourism SCRES. Embedding MO into supply chain systems enables entities to enhance channel specific assets through activity integration and interacting facilities with environments. While competitor orientation facilitates only supply chain responsiveness, customer orientation promotes inter-firm activity integration and supply chain responsiveness (Tan et al., 2014). Competitor orientation may motivate a firm to realise a need for strategic relationship creation. Creating and maintaining collaboration between competitors so as to gain from synergies, e.g. sharing resources can help in building security and resilience (Barkshi and Kleindorfer, 2009; Borekci et al., 2014; Tukamuhabwa et al., 2017). According to Tukamuhabwa et al., (2017) one of the threats to SCRES in developing countries is unfair competition. Competitor orientation is therefore vital in recognizing and managing such a threat in order to enhance resilience, information exchange and superior coordination among supply chain partners (Tan et al., 2014). Furthermore, Zhou et al., (2009) argue that, unlike inter-functional coordination, which is critical for responding to the market intelligence effectively, customer and competitive orientations are the two primary means that firms employ to interact with the dynamic environments. Therefore, we suggest that market orientation may be positively associated with supply chain resilience.

H2. Market orientation is positively associated with supply chain resilience.

2.8 Knowledge management orientation and innovation capability

Scholars have noted that knowledge management (KM) processes such as knowledge acquisition, sharing, and transfer contribute to innovation (Chen, 2012). Innovation and innovativeness are widely perceived as the source of a firm's long-term competitive advantage and survival (Kmieciak and Michna, 2018). Furthermore, some KM scholars agree that KMO is required for a firm to take advantage of emerging opportunities before rivals can recognize them (Cohen and Levinthal, 1990; Davenport et al., 1998; Gray, 2001). Other researchers agree that there is a positive association between KMO and firm innovativeness (Kmieciak and

Michna, 2018). A study in China by Wang and Lin (2013) found that KMO is positively related to administrative and technical innovation. This confirms the earlier works of (Huang and Li, 2009; Chen and Huang, 2009) who assert that knowledge management processes are expected to influence both administrative and technical innovations in organizations. However, other scholars argue that it is innovation that facilitates knowledge sharing (Sabahi and Parast, 2019). It is argued that the benefits of innovation increase the rate of adaptation (Moore and Benbasat, 1991), which in turn facilitates the culture of knowledge sharing in the organisation (Käser and Miles, 2002). *Therefore, we suggest that knowledge management orientation may be positively associated with innovation capability.*

H3. Knowledge management orientation is positively associated with innovation capability.

2.9 Market orientation and innovation capability

Market orientation has been found to positively affect the firm's innovativeness (Kirca et al., 2005). This could be through enhancing the diversity of internal market knowledge, thus creating opportunities for more experimentation and smarter innovation (Han et al., 1998). Until recently, firms created value for customers by developing innovative products and services based on ongoing monitoring of customer needs and market conditions. Now, they have to realize that some of these value-creating activities are carried out in the supply chain beyond the firm's direct control (Kibbeling et al, 2013). Lin et al., (2010) found out that customer relationship management is considered as critical in improving a firm's innovation in all dimensions of product innovation, process innovation, administrative innovation, marketing innovation and service innovation. According to Low et al., (2007), high levels of market orientation lead to high levels of innovativeness within a firm. Hurley and Hult (1998) introduce two innovation constructs into the models of market orientation, i.e., innovativeness and the capacity to innovate. Hurley and Hult (1998) considered that market orientation influences the quantity of innovations that the firm is able to absorb or develop through the

moderating effect of firm's innovativeness. Han et al., (1998) empirically established that market orientation facilitates organizational innovation, as reflected in terms of the absolute number of both technical and administrative innovations implemented. *Therefore, we suggest that market orientation may be positively associated with innovation capability.*

H4. Market orientation is positively associated with innovation capability.

2.10 Innovation capability and SCRES

Reinmoeller and Baardwijk (2005) argued that firms could be able to overcome disturbances and disruptions and adapt to rapid changes in the environment only when they assign enough resources to innovation. Golgeci and Ponomarov (2013) viewed innovativeness as one of the primary drivers of resilience and therefore an important component for a firm to continue with its operations. Golgeci and Ponomarov (2013) concluded that firm innovativeness and innovation magnitude are significantly connected with supply chain resilience. Sabahi and Parast (2019) investigated whether firms that are more innovative are also more resilient to supply chain disruptions. The findings of their study showed that a firm with a more innovative environment would be more resilient to disruptions, because innovation, directly and indirectly, helps firms fortify capabilities that positively affect risk management capability. In building SCRES, risk management culture helps to institutionalize innovation, which requires an organization-wide set of shared beliefs and understanding about innovation (Kamalahmadi and Parast, 2016). Thus, combining the right innovation capabilities with effective strategy can facilitate successful responses to supply chain disruptions (Kwak et al., 2018) thereby facilitating SCRES. Innovation also enables organizations to react to changes or disruptions in a more timely and agile manner, since innovative firms have more adaptability in cases of environmental pressure (Sabahi and Parast, 2019). Innovation can materialize in the form of technologically advanced infrastructure and equipment investments (Wagner, 2008), necessary to reconfigure resources, thereby improving resilience (Ambulkar et al., 2015). Therefore,

innovation can enhance the capabilities of knowledge sharing, agility, and flexibility within a firm and these capabilities in turn have a significant impact on enhancing supply chain resilience (Sabahi and Parast, 2019). Haimowitz and Keyes (2002) claimed that a firm that has a risk management capability enhances its understanding of risk through innovation. The higher velocity and enhanced accuracy of information processing through supply chain innovation facilitates the building of resilience capability based on adaptability, responsiveness and fast recovery (Kwak et al., 2018). In summary, innovative capability may be perceived as a key competitive capability that may positively contribute to supply chain resilience.

H5. Innovation capability is positively associated with supply chain resilience.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This chapter provides the methodology that guided the study. The research methodology contains the research design, population of the study, sampling procedure, sources of data, measurement of variables, ethical considerations and the challenges faced during the study.

3.1 Research Design

The researcher employed a quantitative cross-sectional survey research design. A cross-sectional survey design is carried out at one point in a time because it enables collection of considerable amount of data in a snapshot compared to the longitudinal approach.

3.2 Population of the Study

The study population comprised of 630 manufacturing firms in Kampala, Wakiso and Mukono districts (Uganda Manufacturers Association, 2019). These areas covered the majority of business establishments compared to other regions in Uganda (UBOS report, 2010/2011). The unit of analysis was a manufacturing firm and the unit of inquiry included procurement managers, operations managers, supply chain managers, firm owners (for SMEs) and other staff that are knowledgeable in supply chain and logistics functions. The main reason for choosing this category is that their responsibilities for purchasing or supply management are likely to have an overarching, boundary-spanning view of their firms' supply chains and supplier activities.

3.3 Sample Size

The sample size was 242 manufacturing firms, which were selected using the sample determination table developed by Krejcie and Morgan (1970) through simple random

sampling targeting at least three respondents from each firm to minimize bias. From the sample size, 195 manufacturing firms responded to the questionnaires thereby representing an 80.5% response rate.

3.4 Sampling procedure

A simple random sampling without replacement was applied to select a sample of the manufacturing firms. This involved listing down the names of the manufacturing firms and allocating a number to each of them. Then numbers were selected randomly and each number selected was removed from the population to avoid duplication, until the required number was achieved. Purposive sampling was used to select respondents who are knowledgeable and have expertise to understand the phenomenon and meet the purpose of the study.

3.5 Sources of data and Data collection

The study was a survey based on primary data. Data was collected using self-administered structured questionnaires. Only closed ended questions were used. All questionnaires were hand delivered or e-mailed to the respondents and filled questionnaires were retrieved after a period of two months.

3.6 Measurement of study variables

The questionnaire items were anchored on a 5-point Likert scale ranging from “1= Strongly Disagree (SD) to 5= Strongly Agree (SA)”.

- i. Knowledge management orientation was measured using dimensions of organizational memory, knowledge sharing, knowledge absorption and knowledge reception adopted from Wang et al. (2008).
- ii. Market orientation was measured using dimensions such as customer orientation, competitor orientation and inter-functional coordination adopted from Liu et al. (2013).

- iii. Innovation capability was measured based on dimensions of product innovativeness, process innovativeness, market innovativeness, behavioral innovativeness and strategic innovativeness adopted from Wang and Ahmed (2004).
- iv. Supply chain resilience was measured using dimensions of readiness, response and recovery developed by Chowdhury and Quaddus, (2016).

3.7 Validity and reliability

To ensure content validity, the questionnaires were tested before their final administration by use of professionals and experts. Content Validity Index (CVI) was also computed. To ensure reliability of the research instrument, a Cronbach Alpha test was computed to determine consistency. According to Nunnally (1978), the reliability coefficients of 0.70 or more were considered very acceptable. Exploratory factor analysis was also conducted to assess the loading of questionnaire items to respective constructs.

Table 1 showing the Reliability and Validity of the study.

Variable	Number of Items	Cronbach Alpha Coefficient	Content Validity Index
Knowledge Management Orientation	30	.939	.900
Market Orientation	12	.861	.833
Innovation Capability	20	.877	.850
Supply Chain Resilience	27	.941	.889

Source: **Primary data**

3.8 Exploratory results for the study variables

To establish and understand the factor structure for the study variables, an Exploratory Factor Analysis (EFA) was performed.

3.8.1 Sampling adequacy and suitability

To establish the adequacy and suitability of the data for EFA, Kaiser-Meyer-Olkin and Bartlett's test were assessed. The rule of thumb is that Kaiser-Meyer-Olkin the value should be

above 0.7 and Bartlett's test should be significant ($p < .05$) (Field, 2009). The data met both criteria as shown at the end of each factor analysis table.

3.9 Data processing, analysis and presentation

The data collected was compiled, sorted, classified and entered into the computer and analysed using the Statistical Package for Social Scientists (SPSS) version 24. Descriptive statistics and inferential statistics were used. Pearson correlation analysis was applied to establish the relationship between study variables. Regression analysis was used to determine the degree to which KMO, MO and innovation capability predict SCRES.

3.10 Ethical considerations

The researcher got an introductory letter from MUBS that was presented to the respondents (manufacturing firms). The researcher sought permission from the administrators in charge before the questionnaires were administered. The respondents were assured of anonymity. After data collection and analysis, the questionnaires were destroyed by burning to ensure confidentiality.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND INTERPRETATION OF FINDINGS

4.0 Introduction

This chapter presents the data analysis and interpretation of the results to answer the research questions accruing from the objectives earlier stated in chapter one and recapped here below;

- i. To examine the relationship between knowledge management orientation and supply chain resilience in Ugandan manufacturing firms.
- ii. To examine the relationship between market orientation and supply chain resilience in Ugandan manufacturing firms.
- iii. To examine the relationship between knowledge management orientation and innovation capability in Ugandan manufacturing firms.
- iv. To examine the relationship market orientation and innovation capability in Ugandan manufacturing firms.
- v. To examine the relationship between innovation capability and supply chain resilience in Ugandan manufacturing firms.

4.1 Background characteristics

This includes the individual and organisational characteristics of the respondents as discussed below;

4.1.1 Characteristics of Respondents/Individuals

The results presented in table 2 below reflects the attributes of individual respondents obtained from the study. These include; age group, level of education and position in the firm.

Age Group: The respondents were dominantly in the 36-45 year age group (44.8%) and only 5.2% were aged below 25 years of age group. The results are an indication that the majority of the employees working in manufacturing firms, are relatively middle aged persons and could be relied upon to give information for the study which is quite credible and constructive.

Level of education: The results in table 2 below show that majority of the respondents (84.1 %) in the manufacturing firms hold a Bachelor's degree and above while a few (6.6%) of the respondents hold a qualification in diploma. This is an indication that majority of the respondents are able to read, understand and interpret the questionnaires thus being able to give valid information.

Position in the firm: The majority of the respondents as reflected in the table below are procurement managers (46.4%), followed by both operations managers (41.1%), those in other positions(10.7%), and the least being firm owners (1.8%).

Table 2: Characteristics of respondents/ individuals

Age Group	Count	Valid Percent	Cumulative Percent
Below 25 yrs	23	5.2	5.2
26-35 yrs	153	34.8	40.0
36-45 yrs	197	44.8	84.8
46 yrs and above	67	15.2	100.0
Total	440	100.0	

Level of Education	Count	Valid Percent	Cumulative Percent
Diploma	29	6.6	6.6
Degree	370	84.1	90.7
Masters	35	8.0	98.6
PhD	6	1.4	100.0
Total	440	100.0	

Position in the firm	Count	Valid Percent	Cumulative Percent
Owner	8	1.8	1.8
Operations Manager	181	41.1	43.0
Procurement Manager	204	46.4	89.3
Others	47	10.7	100.0
Total	440	100.0	

Source: Primary Data

4.1.2 Characteristics of manufacturing firms

The results presented in table 3 below depict attributes of manufacturing firms attained from the study, including firm age, number of employees in organisation and nature of business of the firm.

Firm age: The results in table 3 below indicate that majority (57.4%) of the manufacturing firms have been in operation within Uganda for over 10 years and only a few (4.1%) have operated for less than 5 years. This implies that majority of the manufacturing firms have a strong understanding of the business environment in which they operate hence providing reliable information concerning supply chain resilience.

Number of employees in organisation: The results in table 3 below show that majorly large manufacturing firms with more than 100 staff (41.5%) responded to the questionnaires compared to small firms with less than 5 employees (1.5%). This implies that micro enterprises in Uganda are not generally involved in manufacturing perhaps due to capital requirements.

Nature of business: The results in table 3 below shows that majority of the manufacturing firms are in Foods & Beverages industry (22.6%) and Packing, Paper products & Plastics (22.6%), followed by Chemicals, paints, rubber & Form Products (16.9%), others (13.8%), Metal, steel & Aluminum products (12.8%), and lastly Agro Processing (11.3%). The dominance of the Foods & Beverages and Packaging, Paper products & Plastics can be attributed to the availability of raw materials since Uganda is an agro based economy and the favorable investment climate in Uganda.

Table 3: Characteristics of manufacturing firms

Firm Age	Count	Valid Percent	Cumulative Percent
Less than 5yrs	8.0	4.1	4.1
5-10 yrs	75.0	38.5	42.6
Over 10 yrs	112.0	57.4	100.0
Total	195.0	100.0	
Number of Employees in Organization	Count	Valid Percent	Cumulative Percent
Less than 5 employees (Micro)	3.0	1.5	1.5
6-50 employees (Small)	42.0	21.5	23.1
51-100 employees (Medium)	69.0	35.4	58.5
More than 100 employees (Large)	81.0	41.5	100.0
Total	195.0	100.0	
Nature of Business	Count	Valid Percent	Cumulative Percent
Agro Processing	22.0	11.3	11.3
Foods & Beverages	44.0	22.6	33.8
Metal, steel & Aluminum products	25.0	12.8	46.7
Packing, paper products & Plastics	44.0	22.6	69.2
Chemicals, paints, rubber & Form Products	33.0	16.9	86.2
Others	27.0	13.8	100.0
Total	195.0	100.0	

Source: Primary Data

4.2 Factor analysis for the study variables.

The results in the tables below show factor analysis for all the study variables i.e. knowledge management orientation, market orientation, innovation capability and supply chain resilience. Items that had loadings of less than 0.500 were eliminated from the factor components while those that had values of above 0.500 were retained.

4.2.1 Factor analysis for Knowledge management orientation

The results in the table below show that the main components of knowledge management orientation include: knowledge receptivity, knowledge sharing, knowledge absorption and organisational memory which jointly account for 71.186% of the variance in knowledge management orientation. The most dominant component was knowledge receptivity which accounts for 55.915%, followed by knowledge sharing with 7.291% of the study variable. On knowledge receptivity, the most outstanding features were “KMOKR2-Our company culture welcomes debates and stimulates discussions” which had a loading of .903, “KMOKR4-In our company, new ideas are evaluated equitably” which had a loading of .844, “KMOKR1-Managers value knowledge as a strategic asset, critical for success” which had a loading of .842 and “KMOKR9-People who contribute new ideas are invited to participate in future development and implementation of this new idea” which had a loading of .829. This implies that knowledge receptivity and knowledge sharing are considered the best components of knowledge management orientation in manufacturing firms.

Table 4: Factor analysis for Knowledge management orientation

	Knowledge Receptivity	Knowledge Sharing	Knowledge Adoption	Organisational Memory
KMOKR1	.842			
KMOKR2	.903			
KMOKR3	.756			
KMOKR4	.844			
KMOKR5	.738			
KMOKR6	.728			
KMOKR7	.745			
KMOKR8	.727			
KMOKR9	.829			
KMOKS1		.811		
KMOKS2		.807		
KMOKS3		.806		
KMOKS4		.865		
KMOKS5		.871		
KMOKS6		.642		
KMOKS8		.814		
KMOKA1			.878	
KMOKA2			.835	
KMOKA3			.899	
KMOKA4			.702	
KMOOM4				.841
KMOOM6				.823
KMOOM7				.821
KMOOM8				.788
Eigen Values	16.775	2.187	1.383	1.010
Variance %	55.915	7.291	4.612	3.368
Cumulative %	55.915	63.206	67.818	71.186
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.				.873
Bartlett's Test of Sphericity	Approx. Chi-Square			1136.168
	Df			66
	Sig.			.000

Source: Primary Data**4.2.2 Factor analysis for Market orientation.**

The results in the table below were presented so as to explore the factor structure of the Market orientation variable. The results reveal that the components account for 65.605% of the market orientation variable. The most dominant component was customer orientation which accounts for 45.806% and inter-functional coordination accounts for 12.684% while Competitor

orientation 7.115%. With Customer Orientation which accounts for the biggest variance, it was noted that the most critical issues include “MOCUO2-Our business objectives are driven primarily by customer satisfaction” which had a loading of .844 and “MOCUO1-We constantly monitor our level of commitment and orientation to serving customer needs” which had a loading of .797. This implies that customer orientation and inter-functional coordination are regarded as the best components of market orientation. Further, when it comes to market orientation, the two basic attributes that should not be overlooked by management, include the satisfaction of the customer and the commitment towards fulfilling the needs of the customer.

Table 5: Factor analysis for Market orientation

	Customer Orientation	Inter-functional Coordination	Competitor Orientation
MOCUO1	.797		
MOCUO2	.844		
MOCUO3	.679		
MOCUO4	.664		
MOCUO5	.638		
MOIFC1		.546	
MOIFC3		.736	
MOIFC4		.774	
MOCPO1			.637
MOCPO2			.686
Eigen Values	3.497	2.522	1.854
Variance %	45.806	12.684	7.115
Cumulative %	45.806	58.490	65.605
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.			.873
Bartlett's Test of Sphericity		Approx. Chi-Square	1136.168
		Df	66
		Sig.	.000

Source: Primary Data

4.2.3 Factor Analysis for Innovative Capability

The items used for innovation capability in the study were grouped under five components i.e. product innovativeness, process innovativeness, market innovativeness, behavioural innovativeness, and strategic innovativeness. The results in the table below show that these

components jointly account for 79.987% of the variance in innovation capability. The most superseding component is behavioural innovativeness which accounts for 23.051% of the study variable, followed by process innovativeness which accounts for 16.039% and the least being strategic innovativeness which accounts for 12.889% of the study variable. On behavioural innovativeness, the most prominent features were; “ICBEI3-We are willing to try new ways of doing things and seek unusual, novel solutions” which had a loading of .775 and “ICBEI4 -We encourage people to think and behave in original and novel ways” which had a loading of .750. This implies that the behavioural innovativeness and process innovativeness can be regarded as the best components for innovation capability in Ugandan manufacturing firms.

Table 6: Factor analysis for Innovation Capability.

	<i>Behavioural innovativeness</i>	<i>Process innovativeness</i>	<i>Product innovativeness</i>	<i>Market innovativeness</i>	<i>Strategic innovativeness</i>
ICBEI1	.665				
ICBEI2	.716				
ICBEI3	.775				
ICBEI4	.750				
ICPRI1		.522			
ICPRI2		.776			
ICPRI3		.869			
ICPRI4		.684			
ICPDI1			.775		
ICPDI2			.764		
ICPDI3			.791		
ICMAI2				.580	
ICMAI3				.765	
ICMAI4				.669	
ICSTI2					.756
ICSTI3					.755
Eigen Values	4.610	3.208	2.900	2.701	2.578
Variance %	23.051	16.039	14.502	13.506	12.889
Cumulative %	23.051	39.091	53.593	67.099	79.987
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.				.957	
Bartlett's Test of Sphericity		Approx. Chi-Square		3763.054	
		df		190	
		Sig.		.000	

Source: Primary Data

4.2.4 Factor analysis for Supply Chain Resilience

The results in the below show that the main components of supply chain resilience are readiness, recovery and response which jointly account for 61.191% of the variance in supply chain resilience. The most dominant components were readiness and recovery which account for 26.299% and 17.978% of the study variable respectively, while the least dominant component is response with 16.914% of the study variable. With readiness which accounts for the biggest variance, it was noted that the most critical issues include; “SCRRD17- We arrange disaster readiness training for overcoming crisis” which had a loading of .832 and “SCRRD15-We have collaborative planning and decision making practice with the SC partners” which had a loading of .718. This implies that sufficient preparation of staff and constant involvement of supply chain partners are crucial components in building a resilient supply chain.

Table 7: Factor analysis for Supply Chain Resilience.

	Readiness	Recovery	Response
SCR RD12	.501		
SCR RD15	.718		
SCR RD16	.678		
SCR RD17	.832		
SCR RD18	.592		
SCR RD19	.664		
SCR RD20	.608		
SCR REC1		.655	
SCR REC2		.753	
SCR REC3		.614	
SCR REC4		.628	
SCR RES1			.719
SCR RES2			.668
SCR RES3			.754
Eigen Values	6.581	4.614	4.327
Variance %	26.299	17.978	16.914
Cumulative %	26.299	44.277	61.191
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.			.937
Bartlett's Test of Sphericity	Approx. Chi-Square	4231.679	
	Df	351	
	Sig.	0.000	

Source: Primary Data

4.3 Correlation Analysis

The Pearson (r) correlations coefficient was employed to examine the relationship between variables to answer research questions. The Pearson correlation coefficients only range between -1.0 and +1.0. A Correlation coefficient value of .10 is considered weak, while that between .30 - .50 is considered as being moderate. Those values which are above .50 are rated as large (Cohen, 1988), as presented below in table 8;

Table 8: Relationship between the Study Variables

	Mean	SD	1	2	3	4
Knowledge Management Orientation-1	3.649	.955	1.000			
Market Orientation-2	4.000	.608	.507**	1.000		
Innovation Capability-3	3.872	.990	.544**	.525**	1.000	
Supply Chain Resilience-4	3.943	.738	.722**	.672**	.691**	1.000

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

Source: Primary Data

The results in the table above showed that the manufacturing firms in the study were rated moderately on the study concepts of market orientation and innovation capability and the variable descriptives were (Mean = 4.000, SD = .608) and (Mean = 3.872, SD = .990) respectively. Further research shows that there is need to improve on the concepts of knowledge management orientation (Mean = 3.233, SD = .955) and Supply chain resilience (Mean = 3.943, SD = .738).

4.3.1 The Relationship between Knowledge management orientation and Supply chain resilience.

A positive and significant relationship is revealed between knowledge management orientation and supply chain resilience ($r = .722^{**}$, $p < .01$). This implies that firms that enhanced knowledge management orientation in their systems are likely to enhance resilience in their supply chain operations.

4.3.2 The Relationship between Market Orientation and Supply chain resilience

The results in the table above show a positive and significant relationship between market orientation and supply chain resilience ($r = .672^{**}$, $p < .01$). This implies that firms that enhanced their market orientation capability have a possibility of enhancing their supply chains making them resilient.

4.3.3 The Relationship between Knowledge management orientation and Innovation capability

The results in table 8 reveal that there is a positive and significant relationship between knowledge management orientation and innovation capability ($r = .544^{**}$, $p < .01$). This means that the level of knowledge management orientation was likely to be associated with the level of innovation capability in manufacturing firms. Thus firms that have more knowledge management orientation may have more innovation capabilities with their operations.

4.3.4 The Relationship between Market orientation and Innovation capability

Market orientation and innovation capability were noted to have a positive and significant relationship ($r = .525^{**}$, $p < .01$). This implies that there is a possibility that firms which enhanced their market orientation are likely to enhance their innovation capability.

4.3.5 The Relationship between Innovation capability and Supply chain resilience

The results in table 8 above indicate a significant and positive relationship between innovation capability and supply chain resilience ($r = .691^{**}$, $p < .01$). This implies that the level of innovation capability was likely to be associated with the level of supply chain resilience in manufacturing firms.

4.4 Regression Analysis

The regression analysis was applied as reflected in table 9 below to examine the level to which the predictor variables such as knowledge management orientation, market orientation and innovation capability can predict supply chain resilience in manufacturing firms.

Table 9: Hierarchical Regression Model

	Model-1		Model-2		Model-3		Model-4	
	B	<i>B</i>	B	<i>B</i>	B	β	B	β
(Constant)	3.659**		2.505**		1.298**		1.167**	
Firm Age	.037	.028	.001	.001	.020	.015	.059	.045
Number of Employees	.255**	.274**	.024	.026	.019	.021	.055	.059
Nature of Business	.136**	.286**	.068*	.143*	.052*	.109*	.045	.094
Knowledge Management Orientation			.478**	.600**	.362**	.455**	.279**	.350**
Market Orientation					.414**	.331**	.293**	.234**
Innovation Capability							.235**	.306**
Dependent Variable: Supply Chain Resilience								
R		.385		.653		.711		.750
R Square		.148		.426		.505		.562
Adjusted R Square		.135		.414		.492		.548
Std. Error of the Estimate		.707		.582		.542		.511
R Square Change		.148		.278		.079		.057
F Change		11.053		92.173		3.159		24.339
Sig.		.000		.000		.000		.000
Variance Inflation Factor		1.204		1.301		1.380		1.492

Source: Primary Data

The results in table 9 below show that in the first model, i.e. Model-1, the model contains attributes of the manufacturing firms (control variables and these included; firm age, number of employees and nature of business of the firm. The results showed that firm age is not a significant predictor of the dependent variable. The number of employees and the nature of business of the firm are significant predictors of supply chain resilience. However, in Model-2, when we added knowledge management orientation, we realise it is a significant predictor of supply chain resilience and can account for 41.4% of the variance in the dependent variable (Adjusted R Square = .414) In Model-3, with the addition of market orientation variable, the model prediction changes from 41.4% to 49.2% and this time, knowledge management orientation is still a statistically significant predictor ($p < .01$). Market orientation is statistically still a significant predictor ($p < .05$) of supply chain resilience. In the final model-4, we note that

knowledge management orientation, market orientation and innovation capability can account for 54.8% of the variance in supply chain resilience (Adjusted R Square = .548) and the remaining percentage (45.2%) may be attributed to other factors outside this study. The significant predictors of the study in Model-4 are knowledge management orientation and innovation capability ($p < .05$) while market orientation is not a significant predictor of supply chain resilience ($p < .05$). However, knowledge management orientation has the strongest influence on supply chain resilience ($Beta = .350$, $p < .05$). The results in table 9 below show that the regression model was statistically significant ($p < .05$).

CHAPTER FIVE

DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter provides the discussion of the findings of the study and thereafter delivers conclusions, recommendations, limitations and areas for further research are suggested. This chapter is built following the objectives recapped below in table 11;

Table 11: Showing summary of the findings

S/N	Research objective	Decision
1.	Knowledge management orientation is positively associated with supply chain management.	Supported
2.	Market orientation is positively associated with supply chain resilience.	Supported
3.	Knowledge management orientation is positively associated with innovation capability.	Supported
4.	Market orientation is positively associated with innovation capability.	Supported
5.	Innovation capability is positively associated with supply chain resilience.	Supported

5.2 Discussion of results

5.2.1 The relationship between knowledge management orientation and supply chain resilience

The results suggest that knowledge management orientation is positively and significantly related with supply chain resilience. This finding implies that firms with knowledge management resources (e.g. knowledge sharing, knowledge absorption, knowledge receptivity and organisational memory) can mitigate supply chain disruptions, regain normal or achieve improved supply chain performance. This finding is in line with studies by (e.g. Craighead et al., 2007; Craighead et al., 2009; Blackhurst et al., 2011; Cantor et al., 2014) which revealed that knowledge management enables a firm to increase its responsiveness and resilience to changes in the external and internal environment. Similarly, Prahinski and Fan, (2007), and

Richey (2009) argue that effective knowledge sharing (dimension of knowledge management orientation) in an integrated supply chain strengthens a company's capability to evaluate partners and react to disruptions in the supply chain. Proper knowledge sharing and joint planning enables the firm to reduce the supply chain's exposure to disruptions (Craighead et al., 2007). Blackhurst et al., (2011) found that knowledge sharing among supply chain members through joint planning initiatives could lead to the discovery of a supply chain disruption that occurred allowing for the appropriate mitigation strategy to be implemented hence enhancing supply chain resilience of a firm. In addition, Scholten et al., (2015) revealed that knowledge sharing and collaborative communication help to improve supply chain visibility by providing transparency needed to detect and respond to supply chain disruptions upstream and downstream thereby enhancing supply chain resilience. This finding resonates with the study by Lin (2015), on the role of knowledge absorption (dimension of knowledge management orientation) in enabling firm performance. Knowledge absorption through bringing in new knowledge from outside sources significantly affects both the internal and external aspects of performance improvement in a firm. External performance relates to the downstream and/or upstream supply chain portions.

5.2.2 The relationship between market orientation and supply chain resilience

The results showed a positive and significant relationship between market orientation and supply chain resilience. This finding implies, for example, that manufacturing firms that have the ability to build and retain key competences that constantly create superior customer value in a dynamic environment can increase their supply chain resilience by enabling the dissemination of information across departments and faster customer responsiveness to unpredictable changes in demand. This finding relates to Asamoah et al., (2020) who revealed that firms that develop their supply chain resilience enhance their performance in terms of meeting customers' needs even in the event of disruptions. This finding confirms Brandon-

Jones' (2014) assertion that resilient supply chains are a response to delivering reliable products and services to their customers in the face of disruptions. Similarly, this finding is in agreement with Christopher and Peck (2004), Pimenta et al., (2016) and Poberschnigg et al., (2020) who empirically found that cross-functional coordination (dimension of market orientation) not only helps to generate capabilities in the supply chain, but also creates internal agility and internal collaboration which help to mitigate supply chain disruptions.

5.2.3 The relationship between knowledge management orientation and innovation capability

The results suggest that knowledge management orientation is positively and significantly related to innovation capability. This finding implies that a firm that has the ability to use knowledge management resources (e.g. knowledge sharing, knowledge absorption, knowledge receptivity and organisational memory) at its disposal can increase its potential to innovate products and services that meet customers' needs. This finding supports the study by researchers (e.g. by Huang and Li; 2009, Chen and Huang; 2009, Wang and Lin; 2013 and Kör & Maden; 2013) who revealed the remarkable contribution of knowledge sharing, knowledge absorption and knowledge receptivity towards administrative and technical innovations. This finding is also consistent with the study by Wang & Wang (2012) and Lin (2015) revealed that a knowledge sharing culture contributes to firm operational and financial performance either directly or through improved innovativeness. This is further in support of the study by Darroch (2005) who argued that the flow of knowledge both within and across firms is essential for innovation and continuous adaptation, which in turn increases the value of products or services.

5.2.4 The relationship between market orientation and innovation capability

From the analysis, the results suggest that market orientation is positively and significantly related with innovation capability. This finding implies that firms that carry out sufficient market intelligence and consider customers at the fore front of their operations are able to develop products and services that suit the needs of the customers thus gaining competitive edge. This finding resonates with the studies by Hult et al., (2004), Kirca et al., (2005) and Grinstein (2008) who revealed that market orientation is likely to enhance innovation because it involves doing something new or different in response to market conditions. Similarly, this finding supports the study by Hurley and Hult (1998), Low et al., (2007), Lin et al., (2010) who revealed that customer relationship management is considered critical in improving a firm's innovation in all dimensions of product innovation, process innovation, administrative innovation, marketing innovation and service innovation. In addition, a study by Gatignon and Xuereb (1997), revealed that market-oriented firms, in attempting to satisfy the needs of customers can employ their innovative and technological capabilities to develop a new solution to meet these needs. This finding also supports the study by Naidoo (2010) who revealed that inter-functional coordination and competitor orientation are positively associated with marketing innovation.

5.2.5 The relationship between innovation capability and supply chain resilience

The study revealed a positive significant relationship between innovation capability and supply chain resilience. Thus, a combination of the right innovation capability can facilitate an efficient response to a supply chain disruption. This finding supports the study by Sabahi and Parast (2019), and Iddris et al., (2016), who revealed that a firm with a more innovative environment would be more resilient to disruptions, because innovation helps firms fortify capabilities that positively affect risk management capability. In addition, this finding is consistent with the study by Golgeci and Ponomarov (2013) and Kwak et al., (2018), who

argued that process innovation plays a role to eliminate unclear procedures and to devise an agile and responsive system which integrates information from global supply chains.

5.3 Conclusions

The study was intended to establish the relationship between knowledge management orientation, market orientation, innovation capability and supply chain resilience in Ugandan manufacturing firms. The results, in line with the research objectives affirmed that firms which harness knowledge management orientation can enhance the resilience of their supply chains. These findings further confirmed that market orientation and innovation capability can enhance supply chain resilience in manufacturing firms. Since all the independent variables significantly predicted supply chain resilience of manufacturing firms, it can be concluded that manufacturing firms in Uganda can create resilient supply chains through emphasizing their knowledge management orientation, market orientation and innovation capability. It should be noted however that knowledge management orientation was a better predictor of supply chain resilience than market orientation and innovation capability.

5.4 Recommendations

In light of the study findings discussed in the previous section, the following recommendations are provided;

- i. Manufacturing firms in Uganda should enhance knowledge management orientation processes with emphasis on knowledge receptivity through creating an environment that encourages employees to contribute and adopt new ideas within the firms. Employees who have a strong and positive knowledge reception to new ideas are more likely to realize better business performance. Manufacturing firms in Uganda can enhance knowledge receptivity through awarding financial incentives to employees that create new ideas especially towards the success of the firm. Thus, the more knowledge

receptive is the organization, the more accepting and accommodating it is toward new ideas, new systems, structures, and new modes of operating. In addition to this, firms should enhance knowledge sharing capabilities by building information technology systems such as process mechanization and automation of the supply chain that can facilitate communication effectively between organizational subunits and among supply chain members. Sharing knowledge within and outside firm facilitates decision-making, develops collective strength and optimizes firm performance thus enhancing supply chain resilience in the long run. Further, firms should enhance their knowledge absorption capabilities through efficient use of knowledge resources in their possession. This could be knowledge resources from either past experiences or from external sources. Lastly, firms should step up their organizational memory capabilities through systematically de-briefing projects, recording good practices that need to be extended and mistakes that need to be avoided. This in the long run will improve the operational efficiency of supply chains thus achieving resilience.

- ii. Manufacturing firms in Uganda should enhance customer orientation in order to understand the changing needs of customers so as to produce products that give them a competitive edge over others. As a way of enhancing customer orientation, manufacturing firms should develop customer centric values and products by consistently collecting, analyzing, and disseminating sufficient information about their customers. This will enable firms to create business strategies that predict better customer demands in anticipation of market developments within the supply chain. In addition, manufacturing firms should strengthen their inter-functional operations so that they are driven towards creating customer value within the firms. This can be done through integrating business functions e.g. marketing/sales, manufacturing, research and development (R&D) towards serving the needs of the target markets of the firms.

Manufacturing firms should also enhance their competitor orientation by encouraging top managers to discuss key competitor strengths, weaknesses and long term strategies.

- iii. Manufacturing firms in Uganda should enhance behavioral and process innovativeness so as to have a strong innovation capability within the firm. For example, firms should set systems that enable individuals, teams and managers within a firm to achieve sustained behavioral change that is capable of creating an innovative culture (e.g. recognition of honest and original mistakes as an indication of initiative and courage, freedom to the employees to use some of their time to explore new ideas and hunches without having to ask for permission, implied permission to employees to implement changes in their work style if they have the conviction that it will improve the productivity). Innovative culture serves as a catalyst of innovations, while lack of it acts as hindrance to innovations. In addition, manufacturing firms should enhance their process innovativeness by embedding process innovation in a company's procedures, teams, equipment and/or technologies in order to embrace a new or radically improved method of production, organization and delivery of goods and services.

5.5 Limitations of the study and areas for further study.

The study used a cross sectional research design which investigates the variables in a snapshot. But the study variables like knowledge management orientation, market orientation and innovation capability need to be studied over time due to their inherent behavioural elements. Therefore, a longitudinal study would add value to the findings.

The study survey data was collected using close ended questionnaires and this limited the ability of the respondents to provide in-depth information and explanations. This therefore, calls for further research in the form of interviews and case studies to provide more in-depth information.

The study was only limited to manufacturing firms in Uganda in the selected districts of Kampala, Wakiso and Mukono. Further research needs to be done in other sectors and geographical locations in Uganda and other developing economies to provide more generality of the findings.

The study was based on knowledge management orientation, market orientation, innovation capability and supply chain resilience. There are other variables that affect supply chain resilience such as organizational culture, information technology, entrepreneurial orientation and logistics capability among others which can be interesting for further research.

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APPENDICES

APPENDIX 1: QUESTIONNAIRE

MAKERERE UNIVERSITY

MAKERERE UNIVERSITY BUSINESS SCHOOL

Dear Respondent,

I am **Makepu Joel Ngobi**, carrying out a research study on **knowledge management orientation, market orientation, innovation capability and supply chain resilience in Ugandan manufacturing firms (Kampala, Wakiso and Mukono)** which is an academic requirement for the award of a degree of Master of Science in Procurement and Supply Chain Management of Makerere University. You have been selected to participate in this survey questionnaire because of your knowledge in this area. There is no right and wrong answer, but your opinion is important. The data being collected is only for academic purpose and will highly remain confidential. Your participation is highly appreciated.

SECTION A: Background Information (Individual /institutional).

Please tick appropriate box for the items below;

1. Age

Below 25yrs	26-35yrs	36-45yrs	46yrs and above
1	2	3	4

2. Level of Education

Diploma	Degree	Masters	PhD	Others(specify)
1	2	3	4	5

3. What is your position in the firm?

Owner	Operations Manager	Procurement manager	Others(specify)
1	2	3	4

4. How long has this organization been in existence?

Less than 5 years	5-10 years	Over 10 years
1	2	3

5. How many employees are there in your organization?

< 5 employees Micro	6-50 employees Small	51-100 employees Medium	> 100 employees Large
1	2	3	4

6. What is the nature of your business?

Agro-Processing	Foods & beverages	Metal, Steel & aluminum products	Packaging, paper products & Plastics	Chemicals, paints, rubber & Form Products	Others(specify)
1	2	3	4	5	6

These following sections focus your responses towards the stated study statements and your response will be guided as below;

Strongly Disagree (SD) =1, Disagree (D) =2, Not sure (NS) =3, Agree (A) =4, strongly agree (SA) =5.

Please indicate by ticking in the appropriate box to what extent you agree/ disagree to the given statement below;

SECTION B: KNOWLEDGE MANAGEMENT ORIENTATION		Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
OM	Organizational Memory	1	2	3	4	5
KMOOM1	We have systems to capture and store ideas and knowledge.	1	2	3	4	5
KMOOM2	We have systems to codify and categorize ideas in a format that is easier to save for future use.	1	2	3	4	5
KMOOM3	IT facilitates the processes of capturing, categorizing, storing, and retrieving knowledge and ideas in our company.	1	2	3	4	5
KMOOM4	We systematically de-brief projects, record good practices that we should extend and mistakes that we should avoid.	1	2	3	4	5
KMOOM5	We make efforts to remember mistakes we made and avoid making similar mistakes in the future.	1	2	3	4	5
KMOOM6	Information and knowledge stored in our systems is relevant and sufficient.	1	2	3	4	5
KMOOM7	We constantly maintain our information systems and upgrade knowledge stored in the systems.	1	2	3	4	5
KMOOM8	People are encouraged to access and use information and knowledge saved in our company systems.	1	2	3	4	5
KS	Knowledge Sharing					
KMOKS1	We treat people's skills and experiences as a very important part of our knowledge assets.	1	2	3	4	5
KMOKS2	When we need some information or certain knowledge, it is difficult to find out who knows about this, or where we can get this information (reverse coded).	1	2	3	4	5
KMOKS3	We have systems and venues for people to share knowledge and learn from each other in the company.	1	2	3	4	5
KMOKS4	We share information and knowledge with our superiors.	1	2	3	4	5
KMOKS5	We share information and knowledge with our subordinates.	1	2	3	4	5

KMOKS6	We often share ideas with other people of similar interest, even if they are based in different departments.	1	2	3	4	5
KMOKS7	There is a great deal of face-to-face communications in our company.	1	2	3	4	5
KMOKS8	We use information technology to facilitate communications effectively when face to-face communications are not convenient.	1	2	3	4	5
KA	Knowledge Absorption					
KMOKA1	We very often use knowledge that our company possesses, either from the past experience or from external sources.	1	2	3	4	5
KMOKA2	We use information technology to access a wide range of external information and knowledge on competitors and market changes, etc	1	2	3	4	5
KMOKA3	Through sharing information and knowledge, we often come up with new ideas that can be used to improve our business.	1	2	3	4	5
KMOKA4	We have networks of sharing knowledge with other organizations on a regular basis.	1	2	3	4	5
KR	Knowledge receptivity					
KMOKR1	Managers value knowledge as a strategic asset, critical for success.	1	2	3	4	5
KMOKR2	Our company culture welcomes debates and stimulates discussions.	1	2	3	4	5
KMOKR3	We hesitate to speak out our ideas because new ideas tend to be highly criticized or ignored (reverse coded).	1	2	3	4	5
KMOKR4	In our company, new ideas are evaluated equitably.	1	2	3	4	5
KMOKR5	In our company, we evaluate ideas based on their merits, no matter who comes up with the ideas.	1	2	3	4	5
KMOKR6	In our company, we evaluate new ideas rapidly on a regular basis.	1	2	3	4	5
KMOKR7	There is a general culture in our company where people respect knowledge and knowledge ownership.	1	2	3	4	5
KMOKR8	People who contribute new ideas are rewarded financially in our company.	1	2	3	4	5
KMOKR9	People who contribute new ideas are invited to participate in future development and implementation of this new idea.	1	2	3	4	5
KMOKR10	We are held accountable for our own actions and consequences.	1	2	3	4	5

Adapted from Wang et al, 2008

	SECTION C: MARKET ORIENTATION	Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
CUO	Customer orientation					
MOCU01	We constantly monitor our level of commitment and orientation to serving customer needs.	1	2	3	4	5
MOCU02	Our business objectives are driven primarily by customer satisfaction.	1	2	3	4	5
MOCU03	Our strategy for competitive advantage is based on our understanding of customer needs.	1	2	3	4	5
MOCU04	Our business strategies are driven by our beliefs about how we can create greater value for customers.	1	2	3	4	5
MOCU05	We measure customer satisfaction systematically and frequently	1	2	3	4	5
CPO	Competitor Orientation					

MOCPO1	Our salespeople regularly share information within our organization concerning competitor strategies	1	2	3	4	5
MOCPO2	Top management regularly discusses competitor strengths and strategies.	1	2	3	4	5
MOCPO3	We target customers where we have an opportunity for competitive advantage.	1	2	3	4	5
IFC	Inter-functional Coordination					
MOIFC1	All of our business functions (e.g. marketing/sales, manufacturing, research and development (R&D), etc.) are integrated in serving the needs of our target markets.	1	2	3	4	5
MOIFC2	Our top managers from every function regularly visit our current and prospective customers.	1	2	3	4	5
MOIFC3	We freely communicate information about our successful and unsuccessful customer experiences across all business functions.	1	2	3	4	5
MOIFC4	Our managers understand how everyone in our business can contribute to creating customer value.	1	2	3	4	5

Adapted from Liu et al, 2013

	SECTION D: INNOVATION CAPABILITY	Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
PDTI	Product innovativeness					
ICPDI1	In new product and service introductions, our company is often first-to-market.	1	2	3	4	5
ICPDI2	Our new products and services are often perceived as very novel by customers.	1	2	3	4	5
ICPDI3	In comparison with our competitors, our company has introduced more innovative products and services during the past five years.	1	2	3	4	5
ICPDI4	In comparison with our competitors, our company has a lower success rate in new products and services launch.	1	2	3	4	5
PRCI	Process innovativeness					
ICPRI1	We are constantly improving our business process.	1	2	3	4	5
ICPRI2	Our company changes production methods at a great speed in comparison with our competitors.	1	2	3	4	5
ICPRI3	During the past five years, our company has developed many new management approaches.	1	2	3	4	5
ICPRI4	When we cannot solve a problem using conventional methods, we improvise on new methods.	1	2	3	4	5
MAI	Market innovativeness					
ICMAI1	Our recent new products and services are only minor changes from our previous products and services (R).	1	2	3	4	5
ICMAI2	New products and services in our company often take us up against new competitors.	1	2	3	4	5
ICMAI3	In comparison with our competitors, our products' most recent marketing program is revolutionary in the market.	1	2	3	4	5
ICMAI4	In new product and service introductions, our company is often at the cutting edge of technology.	1	2	3	4	5
BEI	Behavioral innovativeness					

ICBE1	We get a lot of support from managers if we want to try new ways of doing things.	1	2	3	4	5
ICBE2	In our company, we tolerate individuals who do things in a different way.	1	2	3	4	5
ICBE3	We are willing to try new ways of doing things and seek unusual, novel solutions.	1	2	3	4	5
ICBE4	We encourage people to think and behave in original and novel ways.	1	2	3	4	5
STI	Strategic innovation					
ICST1	Our firm's R&D or product development resources are not adequate to handle the development need of new products and service.	1	2	3	4	5
ICST2	Key executives of the firm are willing to take risks to seize and explore "chancy" growth opportunities.	1	2	3	4	5
ICST3	Senior executives constantly seek unusual, novel solutions to problems via the use of "idea men".	1	2	3	4	5
ICST4	When we see new ways of doing things, we are last at adopting them.	1	2	3	4	5

Adapted from Wang and Ahmed, 2004

	SECTION E: SUPPLY CHAIN RESILIENCE	Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
RD	Readiness					
SCRRD1	We have flexibility in production in terms of volume of order and production schedule.	1	2	3	4	5
SCRRD2	We produce different types of products to meet customer requirements.	1	2	3	4	5
SCRRD3	We have multi-skilled workforce to continue production.	1	2	3	4	5
SCRRD4	We have contract flexibility such as partial order, partial payment, partial shipment etc.	1	2	3	4	5
SCRRD5	We have flexibility in sourcing.	1	2	3	4	5
SCRRD6	We have flexibility in distribution.	1	2	3	4	5
SCRRD7	We have back up capacity for machinery, parts and logistical supports.	1	2	3	4	5
SCRRD8	We have buffer stock for raw material.	1	2	3	4	5
SCRRD9	We have backup energy/utility source.	1	2	3	4	5
SCRRD10	We share information with supply chain partners.	1	2	3	4	5
SCRRD11	We track information of different operations.	1	2	3	4	5
SCRRD12	We have business intelligence to gather information.	1	2	3	4	5
SCRRD13	We have real-time flow of information throughout the supply chain.	1	2	3	4	5
SCRRD14	We have collaborative forecasting of demand with supply chain partners.	1	2	3	4	5
SCRRD15	We have collaborative planning and decision making practice with the SC partners.	1	2	3	4	5
SCRRD16	We invest in our suppliers' plant to collaborate operations.	1	2	3	4	5
SCRRD17	We arrange disaster readiness training for overcoming crisis.	1	2	3	4	5

SCRRD18	We have resources to get ready during crisis.	1	2	3	4	5
SCRRD19	We track early warning signals.	1	2	3	4	5
SCRRD20	We have contingency planning for mitigating disruptions.	1	2	3	4	5
RES	Response					
SCRRES1	We can respond quickly to disruptions.	1	2	3	4	5
SCRRES2	We can undertake adequate response to crisis.	1	2	3	4	5
SCRRES3	We have response team for mitigating crisis.	1	2	3	4	5
REC	Recovery					
SCRREC1	We have the ability to get recovery in short time.	1	2	3	4	5
SCRREC2	We have the ability to absorb huge loss.	1	2	3	4	5
SCRREC3	We can reduce impact of loss by our ability to handle crisis.	1	2	3	4	5
SCRREC4	We can recovery from crisis at less cost.	1	2	3	4	5

Adapted from Chowdhury and Quaddus, 2016

THANK YOU FOR YOUR TIME

APPENDIX 2: SAMPLE SIZE DETERMINATION TABLE

Table showing Sample size(s) required for the Given Population Sizes (N)

N	S	N	S	N	S	N	S	N	S
10	10	100	80	280	162	800	260	2600	335
15	14	110	86	290	165	850	265	2800	338
20	19	120	92	300	169	900	269	3000	341
25	24	130	97	320	175	950	274	3500	346
30	28	140	103	340	181	1000	278	4000	351
35	32	150	108	360	186	1100	285	4500	354
40	36	160	113	380	191	1200	291	5000	357
45	40	170	118	400	196	1300	297	6000	361
50	44	180	123	420	201	1400	302	7000	364
55	48	190	127	440	205	1500	306	8000	368
60	52	200	132	460	210	1600	310	9000	370
65	56	210	136	480	214	1700	313	10000	375
70	59	220	140	500	217	1800	317	15000	377
75	63	230	144	550	226	1900	320	20000	379
80	66	240	148	600	234	2000	322	30000	380
85	70	250	152	650	242	2200	322	40000	381
90	73	260	155	700	248	2400	327	50000	382
95	76	270	159	750	254	2600	331	75000	384

Source: Adopted from Krejcie & Morgan (1970: 608).

APPENDIX 3: MANUFACTURING FIRMS IN UGANDA

Below are some of the manufacturing firms that were sampled and are registered with Uganda Manufacturers Association.

NO.	NAME OF THE FIRM
1	Mukwano Industries (U) Ltd
2	East African Breweries Ltd
3	C.C.L.E Rubber Company Ltd
4	Uganda Batteries Ltd
5	ARCE Paints and Coatings Ltd
6	Royikems Industries Ltd
7	Global Company Ltd
8	Kaka Manufacturers Ltd
9	Kansai Plascon Africa Limited
10	Dolphin Foods and Beverages (U) Ltd
11	Bakhresa Grain Milling (U) Ltd
12	Hot Loaf Bakery Ltd
13	Century Bottling Co. Ltd
14	Mandela Millers Ltd
15	Giant Steel Industries Ltd
16	Kampala Cement Company Ltd
17	Master Industries Ltd
18	Uganda Clays Ltd
19	Samona Products (U) Ltd
20	Crown Beverages Limited

21	Bajaber Millers Ltd
22	Real Distillers Ltd
23	Britania Allied Industries Ltd
24	Harris International Ltd
25	Wavah Water Ltd
26	Others