

Do not assume it is impossible because you find it hard, but recognize that if something is humanly possible, you too can do it.

..Marcus Aurelius

Cover picture

Smallholder farmers weeding a field of young maize crop. *Courtesy of palladium group, www.thepalladiumgroup.com*

Supply Chain Performance and Satisfaction
Investigating the perceptions of relationship quality in the Ugandan maize supply
chain

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Philosophy (PhD) in Applied Biological Sciences: Agricultural Sciences

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Walter Odongo
December 6, 2017
Ghent, Belgium

Dedication

Dad, Baba Stanley Okello (RIP)

Mum, Ayaa Paskolina Okello

Sister, Lillian Atima (RIP)

Wife, Harriet Odongo

Children: Noella, Nathan, Nicole, Natasha

Your love, encouragement, mentorship and sacrifices made me who I am today!

I hope I have made you proud!

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List of abbreviations

C-F	Customer's perception of their relationship with the focal firm
CFI	Comparative fit indices
EFA	Exploratory factor analysis
F-C	Focal firm perception of their relationship with the customer
F-S	Focal firms perception of their relationship with the supplier
MLE	Maximum likelihood estimate
PCA	Principal component analysis
RDT	Resource dependency theory
RQ	Relationship quality
SCM	Supply chain management
SCP	Supply chain performance
SEM	Structural equations modelling
S-F	Supplier's perception of their relationship with the focal firm
SME	Small and medium sized enterprises
SNT	Social network theory
TCE	Transaction costs economics
MFPED	Ministry of Finance, Planning and Economic Development
MSEM	Multi-group structural equations modelling
UGC	Uganda Grain Council
UIA	Uganda Investment Authority
MTIC	Ministry of Trade, Industries and Cooperatives
USTA	Uganda Seed Trade Association

Summary

Maize is an important cereal crop to the Ugandan economy in terms of trade and income generation. The economic potentials and importance of maize is largely due to the fact that Uganda has a competitive advantage in the production segment of maize supply chain. Uganda has a relatively low cost of production, can produce maize twice a year, and there is high, and increasing demand for maize in neighbouring and regional countries. Because of these strategic advantages, improvements in maize marketing systems have the potential to increase household income and hence contribute to poverty reduction for the predominantly smallholder maize farmers. However, this potential is hampered by the inadequate physical and marketing infrastructure, information asymmetry, and barriers of entry due to the inefficient functioning of related institutions such as credit and transport systems that currently characterise the maize supply chain in Uganda. Additionally, recent transformations in the agri-food sector have led to more competitive supply chains. To succeed in these competitive market environments, supply chain members should increase/improve on their collaboration with partners through the establishing and maintaining long-term relationships.

There is thus a need for a systematic understanding of the circumstances under which business relationships may or may not secure a sustainable competitive advantage for supply chain, as well as how the operational performance of a firm can benefit from its linkages with suppliers and customers. This PhD study sought to assess the perceptions of supply chain relationship quality and its influence on supply chain performance and satisfaction. The dissertation revolves around three interlinked research chapters that were established based on scientifically identified research gaps in supply chain management literature. The first research chapter assessed the perceived influence of supply chain relationship quality on supply chain performance; the second chapter analysed the potential moderating role of relationship characteristics on the association between supply chain performance and satisfaction; and the third chapter investigated the perceived influence of power on supply

chain performance. Our conceptualisation involved the use a triad as a unit of theory and analysis. We used primary data collected from 150 maize supply chain members (comprising 50 triadic chains i.e. 50 suppliers, 50 focal firms, and 50 customers). A combination of descriptive statistics (percentages, frequencies) and structural equations modelling was used to conduct the analyses.

Results show that good relationship quality was perceived to positively influence SCP. Although improved supply chain performance was associated with economic satisfaction, the relationship between supply chain performance and social satisfaction was not significant. Further, we found that relationship duration and firm size did not moderate the relationship between SCP and satisfaction. On power relations, coercive power was perceived to negatively influence SCP while non-coercive power was perceived to positively influence SCP. However, in all the research chapters we observed differences in perceptions of supply chain relationships and their outcomes between the downstream and the upstream elements of the chain. The observed differences in perceptions revealed the different mechanisms through which the supply chain manages its downstream and upstream segments. While the formal downstream relationships were managed based on contracts and trust, the informal upstream relationships were managed through power-dependency and trust relationships.

From the study findings, the following key conclusions were drawn. Through engaging in good supply chain relationships, supply chain members can improve their own performance as well as the performance of the entire supply chain. However, because relationships perceptions differ amongst supply chain members, supply chain relationships have to be tailor-made to fit the respective supply chain member's perspectives, interests and characteristics. The observed differences in perceptions also gives justification for the use of the triadic approach in analysing supply chain relationships. With regards to the maize supply chain, these results imply that improvements in supply chain relationships have the potential to increase the performance of the supply chain. Improvements in supply chain performance should translate

into higher profits and incomes for supply chain members, and hence improvements in the livelihoods for the over four million farmers and traders involved in the maize supply chain in Uganda.

The contribution of this dissertation lies in the fact that it exposes the differences in perception, not only between the downstream and upstream of the supply chain, but also amongst supply chain members. The observed differences in perceptions revealed the different mechanisms through which the supply chain manages its downstream and upstream segments. This therefore provides practical evidence and support for the use of a triad as a unit of theory and analysis in supply chain management studies. The fact that improvements in supply chain performance was perceived to improve economic satisfaction, and not social satisfaction, gives justification for studying satisfaction in terms of both economic and social dimensions. Additional contributions lie in the focus on agribusiness supply chain in a developing country, a dimension which has received little past attention in SCM literature. The findings in this dissertation therefore has significant managerial implications for agribusiness managers, not only in Uganda, but also in other developing countries with similar supply chain characteristics

Preface

This doctoral research was undertaken within the framework a consortium project “Enhancing Capacity for Agricultural Research and Training in Gulu University (ECART: NICHE –UGA 083), financed by the Netherlands Organization for International Cooperation (NUFFIC).

The NICHE – UGA 083 project was implemented by Gulu University, in collaboration with the International Centre for Development Oriented Research in Agriculture (ICRA)-Netherlands; Royal Tropical Institute (KIT)-Netherlands; and National Resources Institute (NRI)-United Kingdom.



The NICHE-UGA 083 project was set out to enable Gulu University effectively contributes to food security improvement in Northern Uganda through agricultural skills development, applied research and outreach. This doctoral dissertation particularly contributes to the specific objective of strengthening staff competencies for research and teaching.

Chapter 1

General Introduction, Context, Research Question and Study Design

1.0 General introduction

1.1 Introduction

In contemporary supply chain management (SCM) literature, it is argued that the management of supply chain relationships has changed from the conventional market/hierarchical perspective, where business relationships are seen as isolated phenomena; to relationship perspectives which stresses stability, interdependency and connectedness (Fynes *et al.*, 2008). This is because the basis of competition has shifted from competition between firms to competition between supply chains (Ketchen *et al.*, 2008; Sezen, 2008; Molnár *et al.*, 2010). As such, the ability to develop long-term, strategic relationships with supply chain partners is viewed as key to a successful supply chain relationship (Crosby *et al.*, 1990; Harland, 1996; Spekman and Carraway, 2006; Su *et al.*, 2008; Molnár *et al.*, 2010; Nyaga *et al.*, 2010; Green Jr *et al.*, 2012). Empirical SCM research suggests that the quality of such supply chain relationships directly influences the performance of individual supply chain member's performance as well the performance of the entire supply chain (Mohr and Spekman, 1994; Spekman *et al.*, 1997; Fynes *et al.*, 2008; Ambrose *et al.*, 2010; Molnár *et al.*, 2010; Gaur *et al.*, 2011; Voldnes *et al.*, 2012).

Realising the importance of good inter-firm relationships, firms are nowadays focusing on exploiting collaborative advantages by closely working with their suppliers and customers (Fynes *et al.*, 2008; Molnár *et al.*, 2010; Srinivasan *et al.*, 2011). Such close working relationships have been postulated to enable supply chain members to by-pass additional transaction costs associated with arm's length relationships (Terpend and Ashenbaum, 2012). As firms becomes increasingly cognizant of the inter-dependencies that exists between their internal operational processes and those of their suppliers and customers, there is need for a systematic understanding of why such interactions may or may not secure a sustainable competitive advantage for supply chain members; and how the operational performance of a firm can benefit from its linkages with suppliers and customers (Naudé and Buttle, 2000; Gagalyuk *et al.*, 2013).

Against this backdrop, two critical issues in supply chain relationships have been inadequately studied and motivate the focus of this PhD dissertation. Firstly, there is the general consensus in the SCM research that the perceptions of all supply chain members should be studied in order to gain insight into their relationship dynamics (Ambrose *et al.*, 2010; Molnár *et al.*, 2010; Oosterhuis *et al.*, 2013; Odongo *et al.*, 2016). Despite this consensus, a common approach in SCM literature has been to focus on the dyad as a unit of theory and analysis (Klein and Kozlowski, 2000; Havila *et al.*, 2004; Ambrose *et al.*, 2010; Oosterhuis *et al.*, 2013; Maestrini *et al.*, 2017). Consequently, researchers have used both single respondent and dyadic samples to understand differences in perception of relationship amongst supply chain members (Rungtusanatham *et al.*, 2003a; Fynes *et al.*, 2008; Molnár *et al.*, 2010; Srinivasan *et al.*, 2011).

Moreover, the differences in perceptions have mainly been tested on separate groups of buyers and suppliers, and rarely between buyers and suppliers from the same supply chain relationship (Terpend *et al.*, 2008; Ambrose *et al.*, 2010; Whipple *et al.*, 2010; Nyaga *et al.*, 2013). Although using a dyadic approach is suitable for the basic understanding of relationship dynamics between a pair of firms in a supply chain, it may not be suitable for exploring the behavioural patterns of the entire supply chain (Van der Vaart and van Donk, 2008; Wu *et al.*, 2010; Oosterhuis *et al.*, 2013). This is because measures obtained from one firm in a supply chain relationship does not provide a valid assessment of the entire supply chain relationship as a whole (John and Reve, 1982). Consequently, it is important to study the perception of both the buyers and suppliers in order to gain a better insight into the nature of, and motivation for their participation in supply chain relationships (Oosterhuis *et al.*, 2013).

Secondly, there are limited studies focusing on supply chain relationships in agribusiness sector from developing countries. Most of the existing studies have generally focused on supply chain relationships in manufacturing and service sectors in developed economies (Fynes *et al.*, 2008; Terpend *et al.*, 2008; Molnár *et al.*, 2010). However, business relationships

may not be the same in different contexts (Claro *et al.*, 2003), and hence a need to assess and understand these relationships in different contexts and settings. This PhD dissertation assessed the perceptions of supply chain relationships and its influence on supply chain performance and satisfaction in a triadic agribusiness supply chain from a developing country context. The dissertation is composed of three research chapters, two of which have been published and one is under review with international peer-reviewed journals. The dissertation is thus a collection of three research papers, led by this introduction chapter, indicating the relevance and coherence in the issues addressed in the papers; and a conclusion chapter, summarizing the key findings, contributions and directions for future research arising from the study findings.

1.2 Research context

This PhD research was conducted in the context of the maize supply chain in Uganda. In this section we highlight the nature, importance as well as key characteristics of the maize supply chain in Uganda that motivated its choice for this study.

Maize is an important cereal crop to the Ugandan economy in terms of trade and income generation (Ranum *et al.*, 2014; Daly *et al.*, 2016). In Uganda, maize is not only a major food crop, it is also used as a key input in animal feeds and local brewing industries. Maize is consumed boiled or grilled, as cake (*posho, Ugali*), as porridge, or as maize flour (MAFAP, 2013; Daly *et al.*, 2016). Maize ranks amongst the top three crops cultivated in Uganda in terms of area planted and volume produced, after bananas (plantains) and cassava (Montalbano *et al.*, 2017). In 2014, the total maize production in Uganda was estimated at 2.8 million MT. Maize production has increased steadily over the past years, with approximately 1 million hectares cultivated annually (MFPED, 2017). Maize is produced predominantly by smallholder farmers who contribute about 75% of marketable surplus. The crop therefore offers farmers some measure of liquidity and flexibility, since it can be dried and stored, fed to livestock, consumed, or sold for cash. Recent trade statistics show that the maize sector

provides a source of livelihood and income to an estimated three million farm households, one million traders, and over 20 exporters in Uganda (MAFAP, 2013; UBOS, 2014; MFPED, 2016; Montalbano *et al.*, 2017). Maize is therefore a major source of household income as it provides employment and income to farmers, input dealers, traders, millers, transporters and other auxiliary service providers along the supply chain.

Although maize does not form a significant component of Ugandans diet, Uganda is a leading producer and exporter of maize and maize flour in Africa. Uganda is the third leading exporter of maize grain and the second leading exporter of maize flour in Africa (Daly *et al.*, 2016). The widespread and increasing production of maize as a cash crop in Uganda has been incentivized by the growing demand in neighbouring countries including the Democratic Republic of Congo, Kenya, and South Sudan (Ahmed, 2012; MAFAP, 2013). The chronic maize deficit in these countries and relatively lower prices in Uganda encourage maize export of maize from Uganda to these countries (FEWSNET, 2017). With two separate growing seasons a year and vast stretches of fertile land, Uganda has a competitive advantage in the production segment of the maize chain. Given the sufficient domestic production, considerable regional demand, and competitive prices, maize stands amongst the main agricultural export of Uganda (Montalbano *et al.*, 2017).

The maize supply chain in Uganda is heterogeneous in terms of sub-sectors and product/process complexity. Maize is marketed through two major channels, namely the grain and flour channels. The grain channel is the major channel for maize trade and handles up to 75% of domestically traded maize and 100% of exported maize (Daly *et al.*, 2016). Participants in the grain channel include farmers, traders, commodity brokers and seed companies. Here, maize is traded as grains or seeds throughout the chain. According to Dalipagic and Elepu (2014), participants in the grain channel include rural and urban small and medium sized enterprises (SMEs), and large-scale traders, with rural SMEs constituting about 90%. The flour channel handles maize which has been processed into maize flour and other by-products for

human and animal consumption. Participation in the flour channel is dominated by maize millers, who constitute about 85% of the SMEs in this channel. This heterogeneity in the Ugandan maize supply chain meant that data for this study was collected from four interconnected supply chains i.e. grain, seeds, feeds and flour chains. Consequently, the external validity of results is much better than would have been the case if a homogenous supply chain was considered (Rungtusanatham *et al.*, 2003a).

Like most agricultural commodity markets in developing countries, the maize supply chain in Uganda is characterized by inadequate physical and marketing infrastructure, information asymmetry amongst supply chain members, and entry barriers due to the inefficient functioning of related institutions such as credit and transport systems (Rashid, 2002; Larson and Mbowe, 2004; Fafchamps and Hill, 2005; Mutonyi *et al.*, 2016). Business transactions in the maize supply chain in Uganda is characterised by many small market players, each taking a small share of the market (Daly *et al.*, 2016; Gelaw *et al.*, 2016). Most participants act individually and carry out on spot, cash based market transactions, which limit any possibilities of both horizontal and vertical linkages.

As such integration in the maize supply chain is not widespread, which facilitates a network of village agents, traders, and wholesalers. The size of these networks is vast, with maize often passing through at least four sets of traders before reaching the processors (focal firms), who are normally located in urban centres. The failure to develop and enforce contractual arrangements amongst supply chain members usually leads to high uncertainties due to opportunistic tendencies, as well as on and off seasonal participants within the maize supply chain (IDEA, 2003; FEWSNET, 2017). On the other hand, the existence of many participants, who adds minimal value along the supply chain does not only increase the transactions costs, but also results into a tendency for powerful participants to collude and attain better profit margins at the expense of the weak ones.

Price determination in the maize supply chain is largely done through on-spot bargaining between the selling and buying parties. Maize deals and transactions are mainly based on visual volumes and quality inspection and assessment. Consequently, there are uncertainties regarding market prices as well as quality specifications. While some farmers are engaged in collective marketing, group marketing is not wide spread in the maize supply chain. As such, coordination amongst traders is limited in the maize supply chain. Thus, the benefits from increased bargaining power and access to market information are inaccessible for some actors along the chain. In reality, access to information by individual participants is used to one's advantage, and most times at the expense of other participants within the maize supply chain. Traders tend to be more speculative, seeking to maximize the margin between the farm gate and the market prices.

Due to uncertainties regarding quality and price information, there are possibilities of opportunistic behaviours by some supply chain members (FEWSNET, 2017). Because the maize supply chain in Uganda is largely informal in nature, relational factors such as lack of trust constitutes a challenge to collaboration amongst supply chain members. For instance, the lack of clear price and quality standards or market information systems usually leads to high transaction costs. Buyers often display opportunistic behaviours and exploit the buyers, who in turn do not consider the buyers trustworthy. In practice, suppliers always tend to add foreign materials such as sand, maize cob to their products, in an attempt to increase the weight of their product because they suspect that the buyer is offering them a price below the market value. This lack of trust leads to dissatisfaction for both buyers and suppliers, and hence poor supply chain relationships (Mutonyi *et al.*, 2016). Consequently, there is a need to understand the nature and dynamics of business relationships in the maize supply chain. Understanding such dynamics will facilitate establishment of long-term and strategic supply chain relationships that will ensure improved performance of the supply chain.

Improvements in performance of an agribusiness supply chain such as maize is very relevant in Uganda in particular, and Africa in general, where agribusiness sector has huge potential for both local, regional and international trade (Bank, 2011; Montalbano *et al.*, 2017). Additionally, the challenges of weak institutions, market failures and imperfections, and infrastructural problems complicates the development of efficiently functioning supply chains, capable of tapping into the growing regional and international market opportunities (Fafchamps and Hill, 2005; Jayne *et al.*, 2010; Mutonyi *et al.*, 2016). These challenges, which are evident in the Ugandan maize supply chain, provides a study context where the relational aspects of supply chain members are very critical in improving supply chain performance.

1.3 State of the art and research gaps

1.3.1 Supply chain performance measurements

Despite the general agreement that a supply chain is composed of at least three members (Mentzer *et al.*, 2000; Molnár *et al.*, 2010; Holma, 2012), supply chain relationships have generally been studied from a firm or dyadic perspective (Narasimhan and Jayaram, 1998; Choi and Wu, 2009b; Ambrose *et al.*, 2010; Oosterhuis *et al.*, 2013). Consequently, there are limited studies analysing supply chain relationships from an entire supply chain perspective (minimum three firms). Most empirical studies that declare interests in studying the entire supply chain usually end up assessing the performance of one supply chain member and generalizing it to the entire supply chain (Medlin, 2006; Ambrose *et al.*, 2010; Gagalyuk *et al.*, 2013). Whereas using the focal firm approach can be good for exploring supply chain relationships and it's outcomes, it may not represent the behavioural patterns of the entire supply chain. The reasoning is that relationships are bi-directional, and as such relationship perceptions may vary from one supply chain member to another. As Medlin (2006) argued, collective constructs needs to be studied in both collective and self-interest contexts. Consequently, focusing solely on the perception an individual member in a supply chain may provide biased results with respect to management styles that are actually based around the entire supply chain relationships.

The entwinement of self and collective interests implies that the success of an individual supply chain member is critical to the success of the entire supply chain; conversely, the success of the entire supply chain will contribute to the success of individual supply chain members (Gagalyuk *et al.*, 2013). The success of the entire supply chain may play an important role in creating long-term collaborative advantages such as improved supply chain performance and satisfaction. This serves as an integrating mechanism that creates initial conditions for collaboration and stabilizes supply chain relationships (Gagalyuk *et al.*, 2013). Consequently, an individual supply chain member can gain strategic advantages if the supply chain level goals are achieved; but it can only sustain this advantages if individual level goals are realised. It is therefore important to assess both the individual level and supply chain level outcomes of supply chain relationships. As John and Reve (1982) noted, measures obtained from one firm in a supply chain relationship does not provide a valid assessment of the supply chain relationship. The argument is that without simultaneous consideration of individual and entire supply chain, the entire supply chain success will remain under-defined; and as such, the validity of the derived implications of supply chain relationships remains debatable (Bagozzi, 1980; Medlin, 2006; Gagalyuk *et al.*, 2013).

Therefore, although several researchers believe that empirical studies on supply chain performance, focusing on the performance of entire supply chain should collect and analyse data from a minimum of three firms in the supply chain (Park and Hartley, 2002), and should therefore seek the perception of each member relative to their upstream and downstream counterparts (Molnar, 2010; Oosterhuis *et al.*, 2013), only few studies (e.g. Molnár *et al.*, 2010; Kühne *et al.*, 2015) have attempted to combined the above in their studies. Moreover, the differences in perceptions have mainly been tested on separate groups of buyers and suppliers, and rarely between buyers and suppliers from the same supply chain relationship (Terpend *et al.*, 2008; Ambrose *et al.*, 2010; Whipple *et al.*, 2010; Oosterhuis *et al.*, 2013; Maestrini *et al.*, 2017).

1.3.2 Level of analysis

As noted in the previous section, the focus of most SCM studies has been on the relationship specific to a pair of firms in dyadic settings; either buyer-supplier or supplier-supplier (Wu and Choi, 2005; Terpend *et al.*, 2008; Athanasopoulou, 2009; Molnár *et al.*, 2010). Although such dyadic focus can shed light on the benefits of being part of a supply chain for an individual member (Rungtusanatham *et al.*, 2003a; Wu *et al.*, 2010), it limits the ability to fully capture the potential benefits to the entire supply chain. Further, while dyadic analysis enables us to describe the interaction between two firms in a supply chain, it cannot fully account for the relational behaviours of the two firms embedded in a supply chain (Choi and Wu, 2009a; Choi and Wu, 2009b; Molnár *et al.*, 2010). As Choi and Wu (2009b) argue, a buyer-supplier, and supplier-supplier relationships are two interdependent pieces of a triadic supply chain relationship. In order to be able to fully understand the relational behaviour of a firm embedded in a supply chain, there is need to move from dyadic to triadic level of analysis (Choi and Wu, 2009a; Molnár *et al.*, 2010). As Choi and Wu (2009b) puts it, studying triads offers a way to understand how a single firm interacts with another single firm; how a single firm interacts with multiple firms; and how multiple firms interact with a single firm.

1.3.3 Number of firms involved in data collection and analysis

Most research on supply chain relationships and its outcomes have the limitations of common method/source variance (Rungtusanatham *et al.*, 2003a). This is a situation where a single firm (usually a focal firm) is asked to provide answers to both independent and dependent variables using the same data collection tool (e.g. Fynes *et al.*, 2005a; Fynes *et al.*, 2005b; Fynes *et al.*, 2008; Srinivasan *et al.*, 2011). This approach to data collection and analysis has been criticised as having several limitations. For instance, there is potential for inflated empirical relationships to occur (Rungtusanatham *et al.*, 2003a). Secondly, it shows one-dimensional perception of supply chain relationship since it seeks the views of one supply chain member and ignores the views of the other members (Uzzi, 1997; Fynes *et al.*, 2008; Molnár *et al.*, 2010). Although most researchers believe that empirical studies focusing on

supply chain relationships and their outcomes should assess the perceptions of all supply chain members (Spekman *et al.*, 1998; Mentzer *et al.*, 2001; Choi and Wu, 2009b; Molnár *et al.*, 2010; Wu *et al.*, 2010; Kühne *et al.*, 2013), very few (such as Gellynck and Molnár, 2009; Molnár *et al.*, 2010; Wu *et al.*, 2010; Kühne *et al.*, 2013) have attempted to involve three supply chain members in data collection and/or analysis.

1.3.4 Moderating factors

Managing business relationships is about coping with different circumstances at different times (Fynes *et al.*, 2008), and there seems to be a no “one size fits all” situation. Empirical SCM literature has identified the need to understand the boundary conditions of the buyer-seller relationships (Zsidisin, 2003; Fynes *et al.*, 2004; Wagner and Bode, 2008; Lavastre *et al.*, 2012). Factors such as relationship duration, firm size and product standardization have been hypothesized to moderate supply chain relationships and its outcomes (Fynes *et al.*, 2005b; Srinivasan *et al.*, 2011; Lavastre *et al.*, 2012). Although these moderating factors are inherent in supply chains (Wagner and Bode, 2008; Lavastre *et al.*, 2012), current knowledge of their effect on SCP and satisfaction is quite limited and empirical research focusing on them are scarce and mostly descriptive in nature (Harland *et al.*, 2003; Fynes *et al.*, 2004; Hallikas *et al.*, 2004; Wagner and Bode, 2008; Srinivasan *et al.*, 2011; Lavastre *et al.*, 2012). Consequently, an assessment of potential moderating factors in supply chain relationships will provide empirical knowledge from a new and extended perspective.

1.3.5 Supply chain relationships in a developing country context

To the best of our knowledge, most previous studies on supply chain relationships and their outcomes has been conducted in the manufacturing and service sectors in developed economies (Fynes *et al.*, 2008; Athanasopoulou, 2009; Gellynck and Molnár, 2009; Molnár *et al.*, 2010). However, supply chain relationships and their outcomes are not the same in all situations (Fynes *et al.*, 2008; Gellynck and Molnár, 2009). Business relationships tend to vary depending on the product type, country or supply chain in question. As such, several authors

have suggested that empirical studies on supply relationships needs to be conducted in different settings so as to validate and compare findings across different contexts (Claro *et al.*, 2003; Fynes *et al.*, 2004; Fynes *et al.*, 2005b; Fynes *et al.*, 2008; Gellynck and Molnár, 2009; Molnár *et al.*, 2010; Gaur *et al.*, 2011; Srinivasan *et al.*, 2011). Consequently, this dissertation conducted an empirical study on supply chain relationships and its perceived influence on SCP and satisfaction in an agribusiness supply chain in a developing country (Uganda) so as to corroborate the existing SCM literature.

1.4 Theoretical perspectives

In trying to understand supply chain relationships and their outcomes, theoretical lenses from a number of academic genres, including strategic management, organisation behaviours, operations management, and purchasing and supply have been used (Chen and Paulraj, 2004b; Ketchen and Hult, 2007; Wynstra *et al.*, 2015). The application of multiple academic theories to SCM provides a greater understanding than would have been realised if a single theoretical perspective was adopted (Molnar, 2010). Supply chain relationships have been majorly studied through the theoretical lens of transaction cost economics (TCE) (Uddin *et al.*, 2017). Besides TCE, studies focusing on triads have delved into the network view of the supply chain relationships to better understand the real and complex relationships that supply chain managers encounter on a day to day basis. As such theories such as social network theory, the resource dependence theory, the balance theory, and the structural-hole concept have been advanced to explain and understand relational behaviours of supply chain members. Due to their relevance to the study context, we base on the above theoretical lenses to understand the behaviours of supply chain members in a three-tire triad that this dissertation focuses on. In the subsequent sub-sections, we first discuss the triadic supply chains, and then present the different theoretical perspectives that are used to facilitate understanding the triadic supply chain relationships.

1.4.1 Triadic supply chains

A supply chain is recognised as a network of buyers and suppliers, the basic unit of which is composed of three members (Mentzer *et al.*, 2001; Choi and Wu, 2009b; Maestrini *et al.*, 2017). The dominant discourse in SCM has been to focus on the dyadic buyer-supplier relationships, as the basis for theory and analysis (Klein and Kozlowski, 2000; Terpend *et al.*, 2008; Oosterhuis *et al.*, 2013). A dyad is composed of two nodes and the link that connects two supply chain member (e.g. buyer-supplier). The focus of dyadic analysis is therefore on how a node affects another node (buyer-supplier), and not on how a link affects another link (e.g. how a buyer-supplier relationship affects the buyer-customer relationship) (Choi and Wu, 2009b; Choi and Wu, 2009a). The dyadic approach to SCM therefore informs us of the fundamental buyer–supplier relationship issues such as cooperation, trust, and commitment, and how they influence firm success (Choi and Wu, 2009a). However, the dyadic approach ignores the fact that the dependence of one firm on another in a supply chain relationship maybe contingent on the availability of a third alternative firm in the supply chain (Simmel, 1950). Therefore, while a dyadic framework enables us explain the relationship between two firms, it cannot fully account for the relational behaviours of two firms embedded in a network. Consequently, Choi and Wu (2009b) argue that, having studied dyadic buyer-supplier relationships for decades, the next logical step is to triadic relationships in order to understand the buyer-supplier interactions in a network.

A triad (Figure 1) is set of three inter-connected supply chain members and the possible ties amongst them (Madhavan *et al.*, 2004). Because dyadic ties are embedded within a triad, they represent a valuable layer of meaning for network analysis and has been referred to as the core structure of higher order networks (Madhavan *et al.*, 2004; Molnár *et al.*, 2010). Consequently, to understand the essence of a network, one must be able to also study how a link affects another link. In this regard, it is the triad, and not the dyad, which has been advanced as the fundamental building block of a network theory and analysis (Choi and Kim,

2008; Choi and Wu, 2009b). Focusing on the triad can therefore enable us to study the behaviour of firms embedded in a supply chain network.

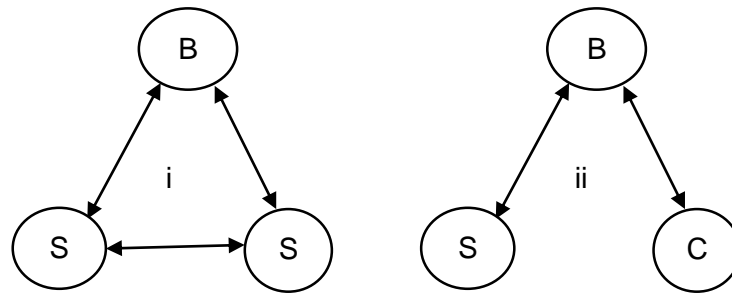


Figure 1: Triadic supply chain typologies

Existing triadic SCM research has mainly focused on two triadic typologies i.e. buyer-supplier-supplier (B/S/S); and supplier-buyer-customer (S/B/C) (Wynstra *et al.*, 2015). As depicted in figure 1, the buyer-supplier-supplier triad is concerned with how a buying firm can influence the relationship between two suppliers (e.g. Dubois and Fredriksson, 2008; Choi and Wu, 2009a; Wu *et al.*, 2010; Pathak *et al.*, 2014). The supplier-buyer-customer triad, also known as a three-tier triad, involves a supply chain member (usually focal firm), that perform different roles in the supply chain. Typically, the focal firm performs the customer role in relation to the supplier, and a supplier role in relation to the customer. This triadic typology is therefore concerned with how the buying company relates with their suppliers and customers, who are not directly connected to each other (e.g. Rossetti and Choi, 2008; Molnár *et al.*, 2010; Peng *et al.*, 2010; Van der Valk and van Iwaarden, 2011; Holma, 2012). In the supplier-buyer-customer triad, which is the focus of this PhD dissertation, the focal firm may create a barrier between the supplier and the customer, and as such, act as a middleman or a broker (Molnár *et al.*, 2010; Van der Valk and van Iwaarden, 2011).

1.4.2 Transaction costs economics

In contemporary SCM research, transaction cost economics (TCE) has emerged as a predominant theoretical basis for studying business to business relationships (Hobbs, 1996; Rindfleisch and Heide, 1997; Geyskens *et al.*, 2006; Macher and Richman, 2008; Rindfleisch

et al., 2010; Trienekens, 2011; Uddin *et al.*, 2017). Transaction cost economics investigates the rationale for governance choices regarding inter-organizational relationships. Transaction cost economics suggests that firms' governance choices should minimize the transaction costs of economic exchange (Williamson, 1985; Williamson, 2008; Wacker *et al.*, 2016). Generally, TCE considers transaction costs dimensions of asset specificity, bounded rationality, opportunism and information asymmetry that can be present in an exchange relationship. As such, TCE argues that business organizations will tend to select governance mechanisms that best mitigates these transaction costs associated business exchanges (Hobbs, 1996; Hobbs, 1997; Kyeyamwa *et al.*, 2008; Rindfleisch *et al.*, 2010; Trienekens, 2011). For instance, supply chain members will safeguard against risk of opportunism through joint investment, monitoring systems and specific organizational arrangements such as contracts.

Transaction cost economics therefore views supply chain relationships as governance mechanisms designed to reduce the hazards of uncertainty and asset specificity. Its considers the influence of supply chain relationships on supply chain performance in a way that there will be greater transaction costs when performance ambiguity is present amongst supply chain members (Hobbs, 1996). The presence of performance ambiguity is a key factor leading supply chain members to focus on long-term relationships. This is because building long-term relationships reduces the perceived risks associated with ambiguous outcomes of business exchanges (Crosby *et al.*, 1990). Transaction cost economics initially dealt with dyadic level analysis and did not encompass supply chain level analysis. However, because transaction costs lies at the heart of SCM, recent practices in TCE have shifted from dyadic to supply chain level analysis in investigating supply chain relationships and its implication on transaction costs (Hobbs, 1996; Spekman *et al.*, 1998; Fynes *et al.*, 2004; Flynn and Flynn, 2005; Huo *et al.*, 2017).

Business relationships in the maize supply chain in Uganda is subject to many uncertainties, especially information and quality aspects, that can lead to increased risks for supply chain

members. These uncertainties are usually caused by poor physical infrastructures (storage facilities, roads, telecommunication); weak institutional infrastructures (government support, sanction systems); and unbalanced trade relationships (dependencies, opportunistic buyer behaviours) (Fafchamps and Hill, 2005; Jayne *et al.*, 2010). Given the emphasis of TCE on costs associated with governance choices, the growing body of TCE examining supply chain relationships, TCE is selected as the main underlying SCM theory in this PhD dissertation. The three research propositions in this dissertation has aspects of relationship choices amongst supply chain members and how they influence performance. Consequently, concepts from TCE, will be applied through all the research propositions and as a building block for theoretical framework.

1.4.3 Social network theory

The fundamental axiom in social network analysis is that supply chain members are not independent, but rather dependant on each other (Uzzi, 1997; Borgatti and Li, 2009). Social network theory (SNT) presupposes that firms strive for closer relationships with their supply chain members when mutual performance benefits can be realised. These benefits can be derived from inter-dependencies or complementarities, or when access to knowledge, resources, markets or technology is sought (Granovetter, 2005; Inkpen and Tsang, 2005; Wynstra *et al.*, 2015). As Granovetter (2005) argued, social networks affects economic outcomes through quality of information. Since much information is subtle, nuanced and difficult to verify, supply chain members do not believe in impersonal sources and instead rely on people they know. Social network is also an important source of reward and punishment, since these are often magnified in their impact when coming from others personally known to a member. Additionally, trust, the confidence that others will do the right thing, develops in the context of a social networks.

The social network theory is useful in the analysis of the benefits of structural positions in a relationship because it focuses on explaining how patterns of social ties produce better

economic outcomes and how established networks can succeed or collapse (Kim, 2014). The social network theory is therefore relevant in studying and hence understanding of the outcomes of the social relationships in the context of the maize supply chains in Uganda. This is because business environment in the maize supply chain is characterized by poor communication of market signals and standards. The market is characterized by a lack of clear flow of market information and transaction are 'on spot' market and cash based. The presence of information asymmetry in the supply chain implies for instance that sellers do not trust that buyers are offering the best price in the market. On the other hand, buyers do not believe that sellers are sincere about the quality of the product they are selling, and as such never sure of the quality of the products they pay for. To ensure quality therefore, buyers have to do inspection on each and every lot of products received. Consequently, this increases the transaction costs and hence reducing the profits received by buyer at each stage of the supply chain. Consequently, supply chain members tend to do business with partners that are well known and have good relationship with them.

Therefore, having a good supply chain relationship is a resource that provides mutual performance benefits to supply chain members. Our research proposition suggests that good relationship quality amongst supply chain members have performance benefits to individual supply chain members as well as the performance of the whole supply chain. We therefore believe that the SNT is relevant in understanding how the quality of supply chain relationships influences supply chain performance. Additionally, the SNT has been successfully applied in previous triadic supply chain studies (Wuyts *et al.*, 2004; Peng *et al.*, 2010; Trienekens, 2011; Holma, 2012).

1.4.4 The balance theory

Coming from behavioural psychology, the balance theory (Heider, 1946) was developed by researchers studying triadic interpersonal relationships and social processes of groups (Osgood and Tannenbaum, 1955; Cartwright and Harary, 1956; Alessio, 1990). The balance

theory suggest that the perceived relationship sentiments amongst three parties will trigger mutual adjustment of their relationships with one another as each party tries to attain cognitive and emotional harmony, or what is known as the balanced state (Choi and Wu, 2009a). As Choi and Wu (2009b) explains, there are three main reasons that qualifies the application of the balance theory in studying triadic supply chain relationships. First, the balance theory is the only theory from an established academic literature genre which addresses triads explicitly; second, although it was developed by considering largely individual level dynamics, management researchers have applied the balance theory to larger social entities such as groups and organizations (Madhavan *et al.*, 2004); and third, the balance theory describes a relationship in a similar to the way it is captured in inter firm relationships in the buyer-supplier relationship literature i.e. whether the two nodes have a positive, cooperative relationship or a negative, adversarial relationship (Morgan and Hunt, 1994).

In the balance theory, a balanced state represents a cooperative, voice-based relationship between two supply chain members based on mutual trust and commitment (Morgan and Hunt, 1994); while an unbalanced state represents an adversarial, exit based relationship that arises from inequity and distrust between amongst supply chain members (Griffith *et al.*, 2006). Understanding of the balanced and unbalanced states, and the transition from one state to another i.e. how an unbalanced state would tend to move to a balance state, is an important characteristic of the balance theory in the study of triads (Choi and Wu, 2009b). The balance theory postulates that individuals in unbalanced states would try to address the relational inequity or mistrust that is causing the imbalance until it is resolved and the chain becomes balanced. Therefore, an unbalanced triadic relationships tends to transform into a balanced stated and a new relationships is formed (Heider, 1958).

This characteristic of the balance theory enables us to predict relationship formation patterns and the nature of new relationships (Heider, 1958). The balance theory therefore provides a basis for studying triadic supply chain relationships and their outcomes (Bagozzi, 1980). Given

the triadic conceptualization of this study, the balance theory has clear implications for understanding triadic supply chain relationships and their outcomes. Particularly, the balance theory could explain the differences in perceptions amongst supply chain members and how these perceptual differences can inform governance choices amongst supply chain members.

1.4.5 Structural-hole concept

Coming from the social network literature, the structural-hole concept (Simmel, 1950; Burt, 1992) describes the relational behaviours of firms in triadic supply chain relationships. The structural-hole concept differs from the balance theory because of its focus on triads wherein two nodes have no direct links except through a common third node, a situation called the 'structural-hole' (Simmel, 1950). It therefore explains the role of the third party as a middleman (*tertius gaudens*); or broker (*tertius iungens*) between two otherwise disconnected parties in a three-tier triad (Simmel, 1950; Burt, 1992; Burt, 1997; Burt, 2004). Structural holes are therefore 'gaps' in connections between supply chain members that offer opportunities for firms who can bridge the gap and link the two otherwise disconnected members. The structural-hole concept (Simmel, 1950; Burt, 2004), has been frequently used in studying such triadic supply chain relationships (Choi and Wu, 2009b; Molnár *et al.*, 2010; Holma, 2012). Although the structural-hole concept demonstrates a lack of connection between two supply chain members, it does not imply that two supply chain members are unaware of each other, rather, it implies that the two supply chain members focuses on their own activities such that they do not attend to each other's activities (Burt, 1997).

According to the structural-hole concept, the third member in the triad can become the beneficiary of the structural-hole by either playing the two disconnected supply chain members against each other since they are not in direct contact; or by allying with one supply chain member to form a strong coalition against the other supply chain member (Simmel, 1950; Burt, 2004; Madhavan *et al.*, 2004; Holma, 2012; Pathak *et al.*, 2014). The structural-hole concept also argues that supply chain nodes with more and stronger relationship ties will have more

information and hence better performance than supply chain nodes with fewer and weaker ties.

The nature of the maize supply chain in Uganda is such that suppliers and customers do not engage directly with each other in business transactions, except through a third member, which is usually the manufacturers or processors (focal firms). This triadic arrangement therefore creates a 'structural-hole' in which the focal firm occupies a 'bridge' position in the supply chain. By occupying this 'bridge' position, the manufacturer/processor is most likely to out-perform their suppliers and customers due to greater access to and control over information (Peng *et al.*, 2010). And because of their superior access to information, the manufacturer/processor is capable of managing the information, either by playing the suppliers and customers against each other, or by allying with one supply member against the other (Madhavan *et al.*, 2004; Holma, 2012; Pathak *et al.*, 2014). Given the focus of the structural-hole concept on the three-tier triad; the fact that it is being increasingly used in triadic supply chain analysis (Choi and Wu, 2009b; Choi and Wu, 2009a; Molnár *et al.*, 2010; Pathak *et al.*, 2014; Wynstra *et al.*, 2015); and the nature of maize supply chain relationships being investigated, we believe that the key constructs of this PhD dissertation also get their roots in the structural-hole concept.

1.4.6. Resource dependence theory

The resource dependence theory (RDT) (Pfeffer and Salancik, 1978) propagates that firms depend on each other because it is not feasible to be self-sufficient and cost effective at the same time (Pfeffer and Salancik, 1978; Belaya and Hanf, 2011b; Wynstra *et al.*, 2015). Hence, businesses collaborate so as to use each other's resources and enter into business relationships (Cai *et al.*, 2013; Murthy and Paul, 2017). The RDT is particularly relevant and has been applied to understanding power relations in supply chains because it looks at power as control or ability to control valuable resources (Reimann and Ketchen, 2017). A supply chain member is therefore vulnerable to the extent that it depends on other firms for resources that are important to its success (Huo *et al.*, 2017). Because of this dependence asymmetry, RDT

assumes that the more powerful firm can activate its power to serve its own interests, to the detriment of the other firms (Cuevas *et al.*, 2015; Reimann and Ketchen, 2017). The RDT therefore view firms as interdependent entities seeking to manage uncertainties that is affecting them. These interdependencies create patterns of dependencies, a situation in which firms that own or control valuable and scarce resources hold power over those firms seeking those resources, to the extent that the dependency is mutual (Pfeffer and Salancik, 1978).

Therefore supply chain managers have to make the best possible use of resources, thereof power in order to operate optimally (Pfeffer and Salancik, 1978). Moreover, being a perceptual construct, the perception of supply chain members will usually differ regarding use of power and its influence on SCP (Besser and Miller, 2010; Nyaga *et al.*, 2013). The RDT is therefore relevant in this study and has been used in previous studies to assess power relationships in supply chains (Fynes *et al.*, 2005b; Ireland and Webb, 2007; Adams *et al.*, 2012; Sanfiel-Fumero *et al.*, 2012; Cai *et al.*, 2013; Chicksand, 2015; Liu *et al.*, 2015). Given the nature of the maize supply chain, characterised by the existences information asymmetry and quality uncertainties; powerful supply chain members may collude to attain better profit margins than the less powerful ones. This therefore gives credence to the use of the RDT as one of the major theoretical lenses for the understanding the nature of supply chain relationships and its outcomes.

1.5 Conceptual framework and definitions

In view of the forgoing discussions, we view a supply chain as a set of three firms (supplier, focal firm, customer) directly involved in the upstream and downstream flows of products and services. As such, we conceptualize a supply chain as a system of vertically related business organizations that jointly aim/work towards providing products and services to the market. The conceptual framework guiding this PhD dissertation is presented in the Figure 2. The operational definitions of the key latent constructs that are used in this dissertation are outlined in the subsequent sections.

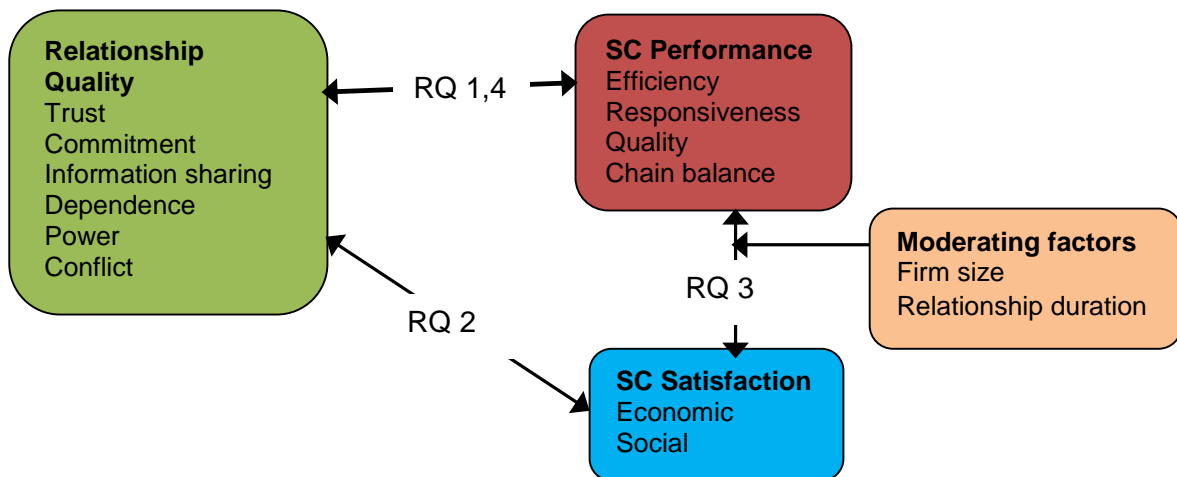


Figure 2: Conceptual Framework
 Source: Own compilation based on Mentzer *et al.* (2001)

1.5.1 Relationship quality

The nature of relationships amongst supply chain members plays an important role in determining their level and nature of involvement in supply chain activities and hence the success of the supply chain. We define supply chain relationship quality (RQ) as the overall assessment of relationship strength and the degree to which the needs and desires of business partners are satisfied in an exchange relationship (Dwyer *et al.*, 1987; Crosby *et al.*, 1990; Johnson, 1999; Naudé and Buttle, 2000; Woo and Ennew, 2004; Srinivasan *et al.*, 2011). Embedded in this definition is the idea that relationship quality represents the overall relationship climate or atmosphere in an abstract, rather than specific dimensions. As such relationship quality has been conceptualised as a higher-order construct consisting of two or more first order constructs/dimensions (Crosby *et al.*, 1990; Naudé and Buttle, 2000; Ulaga and Eggert, 2006; Nyaga *et al.*, 2013). While a number of factors have been used as dimensions of relationship quality, we use trust, commitment, information sharing, dependence, power and conflict. The choice of these dimensions is based on extant literature review (Fynes *et al.*, 2008; Molnár *et al.*, 2010; Gagalyuk *et al.*, 2013; Kühne *et al.*, 2013) and the relevance of these constructs to the study context.

Trust refers to a supply chain member's belief that another supply chain member will perform actions that will result into positive outcomes for the member as well as not take unexpected actions that would result in negative outcomes for the firm (Anderson and Narus, 1990; Fynes *et al.*, 2005b). *Commitment* refers to the willingness of business partners to exert efforts on behalf of the relationship. Its suggest a future orientation in which business partners attempt to build a relationship that can withstand unforeseen problems (Mohr and Spekman, 1994; Monczka *et al.*, 1998).

Information sharing refers to the extent to which critical, and often proprietary formal and informal information is shared amongst supply chain members (Anderson and Narus, 1990; Mohr and Spekman, 1994). Frequent and timely communication helps to resolve conflicts as well as align perceptions and expectations of supply chain members (Morgan and Hunt, 1994; Fynes *et al.*, 2008). *Dependence* is an indicator of the extent to which a supply chain member depends on his/her supply chain partners (Jonsson and Zineldin, 2003). Dependency in supply chain relationships is influenced by the atmosphere of the specific relationships in which the supply chain members operates.

Power is the supply chain member's ability to influence the perception, conduct and/or decisions of another supply chain member (French *et al.*, 1959; Jonsson and Zineldin, 2003). *Power* in inter-firm relationship has been largely studied in terms of coercive and non-coercive typologies. Coercive power occurs when a firm's power enables it to affect another supply chain member's share of the benefits of a collaboration for its own benefits. Non-coercive power increases the value of a relationship through networking, team work and hence better SCP (French *et al.*, 1959; Jonsson and Zineldin, 2003). *Conflict* represents the overall level of disagreements in supply chain relationships. As such, conflict is determined by the frequency, intensity and duration of disagreements amongst supply chain members (Weaver, 2009). Conflict has been postulated as an important relationship quality construct that influences supply chain performance (Pearson and Monoky, 1976; Gailey and Young, 2012).

1.5.2 Supply chain performance

We define SCP as the operational measures that improves for each supply chain member, as well as for the whole supply chain as a result of participation in supply chain relationships (Molnár *et al.*, 2010; Whipple *et al.*, 2010; Gagalyuk *et al.*, 2013; Nyaga *et al.*, 2013). Extant literature suggests that collaborative relationships create opportunities for firms to experience operational performance improvements such as cost reduction, reduced inventory and improved logistic costs (Fynes *et al.*, 2008; Molnár *et al.*, 2010; Wu *et al.*, 2010). Because supply chain members enter into business relationships to pursue both individual as well as supply chain goals (Medlin, 2006; Gagalyuk *et al.*, 2013), we measure SCP at the supply chain level (three firms). Basing on extant literature review, SCP was measured using four constructs of efficiency, responsiveness, quality and chain balance. These are the commonly used constructs to measure the performance especially in of agri-food supply chains (Aramyan *et al.*, 2007; Molnár *et al.*, 2010; Kühne *et al.*, 2013).

Efficiency is a measure of how well resources are utilized and includes logistic costs and profits (Neely *et al.*, 1995; Aramyan *et al.*, 2007). Logistic cost refers to the operating and opportunity cost items that can be influenced by logistic decisions and through integration of management practices and activities throughout the supply chain. Profits refers to the net positive gains from investments or business undertaking (Molnár *et al.*, 2010). *Responsiveness* is a measure of the speed/rate of providing the requested products or services (Persson and Olhager, 2002). Responsiveness is measured in terms of lead time and customer complaints (Aramyan *et al.*, 2007; Molnár *et al.*, 2010). Lead time is the total amount of time that elapses between sending/getting and delivery/receiving of goods or services (Gunasekaran *et al.*, 2001). Customer complaints are registered complaints from customers about products or services (Molnár *et al.*, 2010).

We define *quality* to consist of product and process quality. Within the agri-food supply chains safety, attractiveness and environmental friendliness are the key underlying quality constructs

(Aramyan *et al.*, 2007; Molnár *et al.*, 2010). Product quality consist of safety and attractiveness while process quality is measure by environmental friendliness (Neely *et al.*, 1995; Injazz J Chen and Paulraj, 2004a; Aramyan *et al.*, 2007). Safety measures the extent to which a product meets the acceptable levels of pathogenic organisms, chemical contaminants, or foreign martials. Attractiveness on the other hand refers to the product appeal in the eyes of the customers (Molnár *et al.*, 2010).

Chain balance refers to the distribution of risks and benefits and understanding amongst supply chain members (Bensaou, 1997; Bowersox *et al.*, 2000; Akkermans *et al.*, 2003; Molnár *et al.*, 2010). Risks and benefits distribution refers to the extent to which business risks and compensations are shared amongst supply chain members. Chain understanding refers to the extent to which business partners understand each other's products, process, roles and responsibilities (Bensaou, 1997; Molnár *et al.*, 2010).

1.5.3 Supply chain satisfaction

Supply chain satisfaction (satisfaction) is a supply members' overall appraisal of all outcomes of its working relationships with his/her supply chain partners, including social and economic outcomes (Geyskens and Steenkamp, 2000). Since satisfaction derives from both social and economic aspects (Geyskens *et al.*, 1999; Geyskens and Steenkamp, 2000), it was measured in terms of economic and social satisfaction. *Economic satisfaction* is a supply chain member's positive affective response to the economic rewards that flow from the relationship with his/her partners, such as sales volume and margins (Geyskens *et al.*, 1999). It is the contention with the general effectiveness and productivity of the relationship with his/her partners as well as with the resulting financial outcomes (Geyskens and Steenkamp, 2000). *Social satisfaction* is the supply chain member's evaluation of the psychological aspects of supply chain relationship, in that its interaction with the supply chain partners are fulfilling, gratifying and facile (Geyskens and Steenkamp, 2000). A socially satisfied supply chain member appreciates

the contacts with its partner, because it believes the partner is concerned, respectful, and willing to exchange ideas (Geyskens *et al.*, 1999).

1.5.4 Moderating factors

Following Sharma *et al.* (1981) and Baron and Kenny (1986), we define moderating factors as a variable that systematically modifies the form (slope) and/or strength of the relationship between the a predictor and criterion variable (Sharma *et al.*, 1981). We assessed the potential moderating role of firm size and relationship duration on the relationship between satisfaction and SCP. While *firm size* was measured by the number of full time staff that a business employs (Fynes *et al.*, 2008; MTIC, 2014), *relationship duration* was measured by the length of time (years) that supply chain members have been in business relationships (Kühne *et al.*, 2013).

1.6 Research questions

The overall aim of this PhD dissertation was to examine the perception of supply chain relationship quality (RQ) and how it influences supply chain performance and satisfaction. This aim was achieved through generating answers to four theoretically interlinked research questions as discussed in the subsequent sub-sections.

1.6.1 Does good relationship quality lead to better supply chain performance?

A good RQ is a crucial precursor for any stable exchange relationship which ensures relationship continuity. The association between relationship quality and SCP has been a subject of several empirical studies (e.g. Narasimhan and Jayaram, 1998; Fynes *et al.*, 2004; Fynes *et al.*, 2008; Molnár *et al.*, 2010; Nyaga *et al.*, 2010; Gaur *et al.*, 2011; Srinivasan *et al.*, 2011; Chang *et al.*, 2012; Lee *et al.*, 2013). These studies generally show a positive association between RQ and SCP. However, most of these studies have examined business to business relationships in dyadic settings (Athanasopoulou, 2009; Choi and Wu, 2009b; Molnár *et al.*, 2010; Nyaga *et al.*, 2010). Because a supply chain is defined to comprise of at least three

members, analysing the supply chain at a dyadic level does not bring out the underlying dimensions of the complex supply chain relationships (Mentzer *et al.*, 2001; Rungtusanatham *et al.*, 2003b; Molnár *et al.*, 2010; Wu *et al.*, 2010; Kühne *et al.*, 2013).

Secondly, most of these studies collected and analysed data from either the buyer or seller, using the focal firm approach. This is an approach to data collection and analysis where one supply chain member is asked to provide answers to both dependant and independent variable using the same study instrument. The use of the focal firm approach raises the possibility of inflated empirical relationships that limits the application of these findings to the entire supply chain (Narasimhan and Jayaram, 1998; Rungtusanatham *et al.*, 2003a; Fynes *et al.*, 2008; Molnár *et al.*, 2010; Whipple *et al.*, 2010; Wu *et al.*, 2010). This research question is addressed in chapter 2 through analysing the perception of RQ and how it influences SCP. Further, in chapter two, we assess whether the perceptions of RQ differs between the downstream and upstream of the supply chain. These relationships are assessed in a triadic agribusiness supply chain, comprised of three members (supplier, focal firm and customer).

1.6.2 Does improved supply chain performance lead to higher satisfaction?

Previous studies in marketing, operations, logistics and service sectors provides a considerable support for the link between SCP and satisfaction (Cronin Jr and Taylor, 1992; Skinner *et al.*, 1992; Innis and La Londe, 1994; Leuthesser and Kohli, 1995; Daugherty *et al.*, 1998; Stank *et al.*, 1999; Benton and Maloni, 2005). For instance, in the industrial service sector, Stank *et al.* (1999) show that both relational and operational performance positively influence satisfaction; in logistics, both operational and relational performance have been shown to positively influence satisfaction (Innis and La Londe, 1994; Daugherty *et al.*, 1998); and in marketing, service quality has been identified as an antecedent of satisfaction (Cronin Jr and Taylor, 1992; Leuthesser and Kohli, 1995). These studies suggest that as operational performance increases, a supply chain member should respond positively by working more

closely with their partners and thereby ensuring more future revenues and resulting satisfaction.

However, there is lack of evidence on the relationship between SCP and satisfaction from the agribusiness sector, more especially in the developing country context. Satisfaction affects supply chain members' morale and the resulting incentives to participate in collective activities (Benton and Maloni, 2005). Since the agribusiness supply chains in developing countries operates in circumstances which are quite different from those in which the service and manufacturing sectors in developed countries operate, it is vital to assess the relationship between SCP and satisfaction in a developing country context as well. In chapter 3, we address this research question by assessing the link between SCP and satisfaction. Additionally, we also assess the potential moderating role of relationship duration and firm size on the relationship between SCP and satisfaction.

1.6.3 How do power relations influence supply chain performance?

Supply chain management literature demonstrates that power is a vital predictor of SCP (Molnár *et al.*, 2010; Nyaga *et al.*, 2013), adoption (Liu *et al.*, 2015), innovation capacity (Kühne *et al.*, 2013), and customer integration (Zhao *et al.*, 2008). However, power relations in supply chains keeps evolving as firms become more complex and multifaceted. Additionally, power relations may vary between formal and informal business settings, as well as between manufacturing/services and agribusiness sectors. Therefore, it is important to understand how supply chain members perceive power relations in in the supply chain and how it influence their share of supply chain benefits, and hence performance (Nyaga *et al.*, 2013; Rindt and Mouzas, 2015).

Especially in the context of small and medium sized enterprises (SMEs), power disparity can affect supply chain members collaborative behaviours, either due to opportunism or as a result of powerful members taking advantage to appropriate a greater value of the relationship to

themselves (Hingley, 2005; Nyaga *et al.*, 2013; Lackes *et al.*, 2015). Currently, there is limited research on the influence of power on SCP in the context of agribusiness SMEs (Adams *et al.*, 2012; Sukwadi *et al.*, 2013). Large agribusiness organizations are often well equipped and prepared to play the power games in their favour. Consequently, it is important for agribusiness SMEs managers to get a better understanding of how power can influence SCP, and how to deal with power issues in the supply chains (Gelinias and Bigras, 2004; Matanda *et al.*, 2016). In chapter 4, we address this research question by assessing the perception of power, its use and how it influences performance.

1.7 Methodology

1.7.1 Design for sampling and data collection

Primary data was collected between April 2014 to February 2015 through face to face interviews with agribusiness SME owners and/or general managers. The choice of business owners or managers was done to ensure that accurate data about the business organizations and its functioning could be obtained as these were considered knowledgeable respondents about the operations and organisation of the SMEs. Previous studies such as Zhao *et al.* (2015) and Ambrose *et al.* (2010) employed similar methodologies in order to get the best responses to their questions related to supply chain relationships and its outcomes. The focal firms were purposively identified and selected based on their involvement in the supply chain as either processors or wholesalers. Since there was no formal list of existing processors and manufacturers in the maize supply chain, the identification of the focal firms was based on key informants in the maize supply chain as well as through maize marketing organisations such as the Uganda grain council (UGC) and the Uganda seed trade association (USTA).

Prior to the actual interviews, the questionnaire was subjected to peer review by academicians and experts in supply chain management at Ghent University, as well as experts and key informants in the maize supply chain in Uganda. After modifications based on inputs from academicians and experts, the questionnaire was pretested in three maize supply chains

(three suppliers, three focal firms and three customers) in Uganda. The aim of the pre-test was to check the validity of the contents and constructs, as well as the ease of administering the questionnaire in the maize supply chain in Uganda. Based on the feedbacks obtained from pre-tests, the questionnaire was revised and a final version produced. The final questionnaire was then adjusted so as to fit each supply chain perspectives (i.e. supplier, focal firm, customer) considered in this study. Ultimately, we had three interlinked versions of the questionnaire, each tailored to reflect the three supply chain perspectives under investigation (see annex i, ii, and iii). This approach to the design of questionnaire corresponds to that used by Molnár *et al.* (2010) and Kühne *et al.* (2015) to collect and analyse data from a triadic agri-food supply chains.

A matched triad approach (Molnár *et al.*, 2010; Kühne *et al.*, 2015) was employed in data collection. We chose the matched triad approach to data collection due to the fact by collecting data from multiple sources, we minimize the chances of common method bias (Podsakoff *et al.*, 2003; Rungtusanatham *et al.*, 2003a; Wuyts *et al.*, 2004; Boyer and Swink, 2008; Marcus *et al.*, 2017). Additionally, using the matched triad approach was done so as to facilitate the subsequent triadic data analysis. Each supply chain considered had a triplet of supply chain members (supplier, focal firm, customer). Data collection always started with the focal firm, to facilitate the subsequent snowball identification of the supplier and the customer of the focal firm.

Snowball sampling technique was deemed appropriate for this study because it was hard to identify and obtain data directly from each potential respondent category. As such, the ex-ante identification of survey respondents, in this case the current important supplier and customer of the focal firm was not feasible (Havila *et al.*, 2004; Roseira *et al.*, 2010; Kühne *et al.*, 2013). Consequently, the most practical and useful technique was to ask the identified focal firms to nominate their most important suppliers and customers to whom the researcher has no access and/or knowledge of (Heckathorn, 2011; Marcus *et al.*, 2017). Previous studies that collected

triadic data such as Molnár *et al.* (2010), and Kühne *et al.* (2013) used similar approaches to collect multi source data in supply chain respondents. The use of snowball sampling technique also facilitated the assignment of actual names to each triad (supply chain) and hence tailor the measurement instrument to the particular supply chain relationships (Rossomme, 2003; Molnár *et al.*, 2010). A major limitation of the snowball sampling technique is that it may lead to possibilities of favourable self-evaluation on the behaviours to be rated by respondents (Marcus *et al.*, 2017). However, this possibility was averted by the design of our study instruments which asked respondents to rate the perceptions of their partners, and not their own. For instance, a supplier was asked to rate their perception of the focal firms' power and not their own power.

During data collection, each focal firms was first asked to identify one of their current important supplier and customer, before indicating their subjective assessments with respect to their individually chosen supplier (F-S) and customer (F-C). Similarly, each nominated supplier was requested to provide their subjective assessment with respect to the focal that nominated them (S-F); and each nominated customer was asked to provide their subjective assessment with respect to the focal firm that nominated them (C-F). Through taking this approach to data collection, we were able to consciously select respondents who were able to answer questions related to the specific relationships attributes with a particular supply chain partner (Havila *et al.*, 2004). The perspectives used in data collection are summarized in figure 3.

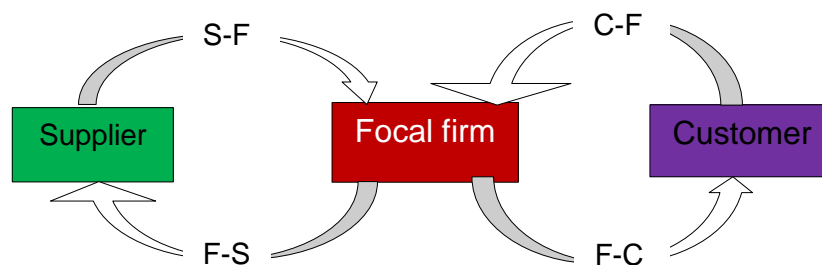


Figure 3: Relationship directions considered in data collection and analysis

To be considered for inclusion in the interview, a supplier had to be an SME dealing directly in maize or maize products. Therefore, nominated suppliers who were dealing in services such as transportation or other inputs provision were left out of the interview process. For customers, the inclusion criterion was that they had to be SMEs buying maize or maize product directly from the focal firms that nominated them for onward sales. In case of a non-response or a mismatch from either of the nominated customer or supplier, the whole supply chains was dropped from the interview process.

We contacted 102 focal firms for interviews, of which, only 56 accepted to participate in the interviews. Consequently, we expected 56 customers and 56 suppliers to be interviewed in order to complete the matched triads. However, two of the nominated suppliers and four of nominated customers refused to participate in the interview process. This resulted into six of the initiated interviews being dropped from the data collection process. In the end, we realised 50 matched triads i.e. 50 suppliers, 50 focal firms and 50 customers (Table 1) representing 150 successful interviews. This completion rate of about 90% for the initiated interviews is consistent with the snowball method of sampling. Most (73%) of the responding firms were small enterprises, who had been in business operations for more than five years. The majority (59%) were involved in the marketing of maize as flour. The SMEs were involved in the production, processing and marketing of maize in form of flour, feeds, seeds and grains (Table 1).

Table 1: Sample characteristics (N=150, 50 supply chains)

Classification	Flour	Feeds	Seeds	Grains	Total
By chain member					
Supplier	7	00	25	8	50
Focal firm	41	2	7	00	50
Customer	41	1	6	2	50
By firm size					
Micro	19	00	04	12	35
Small	66	03	33	08	110
Medium	04	00	01	00	05

Note: Micro sized firms (≤ 4 employees); small sized firms ($5 \leq 50$ employees); medium sized firms (> 50 employees)

SME classification based on the number of employees (MTIC, 2014)

1.7.2 Measurement and scaling

The interview questionnaire was structured into five major sections. The first section examined the supply chain member characteristics; including legal status, type of product traded, turnover and business size. The second section examined the supply chain relationship quality (RQ) perception of the supply chain members. Relationship quality was measured using 22 statements representing seven RQ constructs of trust, commitment, information sharing, dependence, coercive power, non-coercive power and conflict (Table 2).

Table 2: Relationship quality constructs

Trust (Fynes <i>et al.</i> , 2008; Molnár <i>et al.</i> , 2010; Nyaga <i>et al.</i> , 2010)
Our supplier/ customer keeps promises
Our company has high confidence in our supplier/ customer
We believe that the information our supplier/ customer provides us is correct
Our supplier/ customer considers how its decisions/ actions may affect us
Commitment (Fynes <i>et al.</i> , 2008; Molnár <i>et al.</i> , 2010; Nyaga <i>et al.</i> , 2010)
We expect this relationship to continue for a long time
We are committed to this supplier/customer because we like to continue to cooperate with them
We expect this relationship to strengthen over time
Considerable effort and investment has been undertaken in building this relationship
Information sharing (Mohr and Spekman, 1994; Heide and Stump, 1995; Whipple <i>et al.</i> , 2010)
We inform this supplier/customer in advance for changing needs
In this relationship, it is expected that any information which might be helpful to the other party will be provided
Both parties are expected to keep the other informed about events or changes that may affect the other party
This supplier/customer keeps us informed of new developments
Dependence (Skinner <i>et al.</i> , 1992; Ganesan, 1994; Batt, 2004; Molnár <i>et al.</i> , 2010)
Our company is not significantly dependent on our supplier's/ customer's resources (e.g. raw materials, packaging machines, transport facilities)
Our company is significantly dependent on our supplier's/ customer's capabilities (soft skills, such as expertise)
Our company can easily replace our supplier/ customer
Non-coercive power (Skinner <i>et al.</i> , 1992; Geyskens and Steenkamp, 2000; Molnár <i>et al.</i> , 2010; Kühne <i>et al.</i> , 2013)
Our company receives benefits from our supplier/ customer when we regularly meet their needs /requirements (technical support/ free advice/ financial support/ market information etc.)
Our supplier/customer rewards our company without requiring specific behaviour in return (technical support/ free advice/ financial support/ market information etc.)
Coercive power (Skinner <i>et al.</i> , 1992; Jonsson and Zineldin, 2003; Batt, 2004; Molnár <i>et al.</i> , 2010; Kühne <i>et al.</i> , 2013)
We can be sure that our supplier/customer will not retaliate our company when we do not accept our suppliers' / customers' business proposal (keep back important information / terminates contract, press down price, etc.)
We can be sure that our supplier / customer will not neglect our interests even if we fully meet the conditions detailed in the contract with our supplier / customer (keep back important information / terminates contract, press down price, etc.)
Conflict (Reve and Stern, 1979; Mohr and Spekman, 1994; Molnár <i>et al.</i> , 2010; Kühne <i>et al.</i> , 2013)
We disagree with our suppliers/customer on critical issues
Our business interest doesn't match with that of our suppliers/customer
We often have debates with this customer on several issues

The selection of the RQ constructs were based on existing literature in SCM (Table 2), as well as their relevance to the study context. All items were anchored on a 5-point Likert scale (1-strongly disagree, 2-disagree, 3-neutral, 4-agree, 5-strongly agree) (see annex i, ii, iii).

The third section assessed SCP perception of the supply chain members using 11 statements depicting four SCP constructs (efficiency, responsiveness, quality and chain balance). The fourth section of the questionnaire assessed satisfaction amongst supply chain members. Respondents were asked to indicate their levels of agreement/disagreement with 8 statements relating to two constructs of satisfaction (social and economic satisfaction). Similar to RQ constructs, the selection of the SCP and satisfaction constructs was informed by the existing literature as well as their relevance to the study context (Table 3). The fifth section assessed the general business environment including relationship duration, demand and supply characteristics in which the identified supply chains operated. All the constructs were used differently to answer particular research questions, details of which are presented in the different research chapters.

Since performance was generally defined as the extent to which goals are achieved (Molnar, 2010), the focal firm's performance is the extent to which the focal firms achieves their goals; the supplier's performance is the extent to which the suppliers achieves his goals; and the customer's performance is the extent to which the customers achieves their goals. As such, it is important to note the difference between the performance of the focal firm, supplier and customer, and the contribution of these chain members to each other's performance. For instance, giving a high item score on *doing business with this supplier helps my company significantly reduce transaction costs*, corresponds with a highly perceived contribution of the supplier to lowering the focal firms' transaction costs. This is an indicator of the perceived contribution of the supplier to the focal firm's performance, which is not necessarily the equal to the performance of the focal firm. Consequently, the results are interpreted as an indication

of the perception of the performance contribution of the supply chain member to the respondent company's performance.

Table 3: Supply chain performance and satisfaction constructs

Efficiency (Neely <i>et al.</i> , 1995; Beamon, 1999; Aramyan <i>et al.</i> , 2007; Molnár <i>et al.</i> , 2010; Kühne <i>et al.</i> , 2013)
Doing business with our supplier/ customer helps my company to lower transport costs significantly
Doing business with our supplier/ customer helps my company to maintain acceptable profitability
Doing business with this supplier/customer significantly reduces our transaction costs
Responsiveness (Beamon, 1999; Gunasekaran <i>et al.</i> , 2001; Aramyan <i>et al.</i> , 2007)
Doing business with our supplier/ customer helps my company to reduce lead time (time from sending/getting the request till reply)
Doing business with our supplier/ customer contributes to reducing customer/consumer complaints
Doing business with this supplier enable our company to deliver products on time
Quality (Chen and Paulraj, 2004a; Aramyan <i>et al.</i> , 2007; Molnár <i>et al.</i> , 2010; Kühne <i>et al.</i> , 2013)
Doing business with our supplier/ customer helps my company to manage product safety
Doing business with our supplier/ customer helps my company to produce more attractive products
Doing business with this supplier/customer enables my company to produce high quality products
Chain Balance (Bowersox <i>et al.</i> , 2000; Akkermans <i>et al.</i> , 2003; Molnár <i>et al.</i> , 2010)
Doing business with our supplier/customer contributes to a more balanced distribution of risks and benefits along the chain
Doing business with our supplier/customer helps my company to better understand other chain members' interests
Social satisfaction (Geyskens and Steenkamp, 2000; Jonsson and Zineldin, 2003; Batt, 2004; Molnár <i>et al.</i> , 2010; Nyaga <i>et al.</i> , 2010)
Our supplier/ customer hardly considers our arguments when changing prices*
This supplier/ customer leaves our company in the dark about what we ought to know*
Interactions between our firm and this supplier/customer is characterised by mutual respect
This supplier/customer expresses their feelings tactfully
Economic satisfaction (Geyskens and Steenkamp, 2000; Jonsson and Zineldin, 2003; Molnár <i>et al.</i> , 2010; Nyaga <i>et al.</i> , 2010)
Our business relationship with this supplier/ customer significantly contributes to our <u>profitability</u>
Our business relationship with this supplier/ customer is very attractive because of getting <u>fair prices</u>
This supplier/customer provides my firm with marketing and <u>selling support of high quality</u>
Our relationship with this supplier/customer has provided us with a dominant and profitable market position

1.7.3 Data analysis

Data analysis varied depending on the nature of the research question being answered. Generally, quantitative techniques were employed in analysing the data to answer specific research questions. Given the multiple dependence nature of the hypothesised relationships, structural equations modelling (SEM) was deemed appropriate and was used in all the research chapters in this dissertation. We chose SEM due to its ability to measure multiple relationships and for accepting combined dependence relationships concurrently in a single comprehensive model (Benton and Maloni, 2005; Janssens *et al.*, 2008; Byrne, 2016). Additionally, factor analysis, confirmatory factor analysis, and multi-group SEM (MSEM) was used depending on the specific research question requirements. Whilst data was

independently collected from individual supply chains members, the unit of data analysis was the supply chain (Molnár *et al.*, 2010; Kühne *et al.*, 2014; Kühne *et al.*, 2015). Details of the specific analysis methods for the different research questions is presented under the different research chapters.

1.8 Intended contributions

The motivation for conducting a PhD research is to contribute to the knowledge base in a specific scientific discipline, and to facilitate the application of that knowledge in professional practice. This section discusses the intended conceptual, methodological and empirical contributions of this PhD dissertation. Figure 4 depicts the three areas and the extent to which this dissertation is intended to contribute to them.

Contribution	Replication	Extension	Innovation
Conceptual			
Methodological			
Empirical			

Figure 4: Intended research contributions

1.8.1 Conceptual contribution

Conceptually, this dissertation is intended to contribute to the ongoing debate in SCM literature that a firm or a dyad is heavily influenced by the supply chain in which it operates, as such supply chains should be conceptualised as triads at least (Kühne *et al.*, 2013). By taking a triadic as a unit of theory and analysis, the conceptualisation used in this study goes beyond the firm and dyadic approach that is predominantly used in contemporary SCM literature. This research is also intended to advance and give credence to the TCE, SNT, the balance theory, the structural-hole concept, the RDT through empirically testing their application in agribusiness SMEs in a developing country context.

1.8.2 Methodological contribution

The intended methodological contribution of this PhD dissertation lies in the replication of existing methods used in SCM. The methodology used in this PhD dissertation is in line with generally accepted practices. This dissertation applied quantitative research methods to provide insight into, and an understanding of the research questions as well as answers and conclusions to the overall research proposition. Additionally, this dissertation innovatively applies the triadic approach to data collection and analysis to provide an insight into the perceptions of supply chain relationships and its influence on SCP and satisfaction in a triadic supply chains. Our methodology therefore incorporates novel (innovation) approaches such triadic analysis, SEM, and MSEM.

1.8.3 Empirical contribution

Most previous studies on supply chain relationships and their outcomes have been conducted in the manufacturing and service sectors in developed countries (Fynes *et al.*, 2008; Athanasopoulou, 2009; Gellynck and Molnár, 2009; Molnár *et al.*, 2010). However, we argue that supply chain relationships are not the same in all situations (Gellynck and Molnár, 2009). This PhD dissertation is intended to make an empirical contribution by investigating supply relationships and their outcomes in a developing country context (replication). Further intended empirical contribution of this PhD dissertation lies in the choice of the sector, the agribusiness sector in developing countries have received little past attention in scientific literature, however its particularities make it an interesting sector to study (extension). With the predominance of smallholder farmers, traders and manufacturers, improvements in business relations, hence performance will increase income for the supply chain members. A properly functioning maize supply chain will therefore lead to fewer poor people and hence economic development. Consequently, this dissertation is intended to have a significant managerial implication in agribusiness sector, which is dominated by SMEs in developing countries such as Uganda.

1.9 Design and structure of the dissertation

This dissertation organised into five chapters in total. In chapter we introduce the research focus, the study context, present the research gaps, theoretical as well as conceptual frameworks, research questions and hypothesis, and research design. In chapter 2 we assess the perceived influence of supply chain relationships quality on supply chain performance. In chapter 3, we analyse the link between satisfaction and SCP performance as well as the role of moderating factors. Chapter 5 analyses the effect power on SCP. Finally, the fifth chapter recapitulates the main findings from chapters two through four to provide the concluding remarks, describe the main limitations of the study, and indicates the directions that future research should take.

Chapter 2

Supply Chain Relationship Quality and Performance

Based on:

Odongo, W., Dora, M., Molnár, A., Ongeng, D., & Gellynck, X. (2016). Performance perceptions among food supply chain members: a triadic assessment of the influence of supply chain relationship quality on supply chain performance. *British Food Journal*, 118(7), 1783-1799.

Odongo, W., Dora, M., Molnar, A., Ongeng, D., & Gellynck, X. Performance perceptions among supply chain members: *A triadic assessment of the influence of supply chain relationship quality on supply chain performance. A paper presented at the 10th IGLS Forum, February 15-18, 2016.*

2. Supply chain relationship quality and performance

2.1 Introduction

The general agreement in contemporary supply chain management (SCM) literature is that supply chain relationships have shifted from the dyadic perspective, where relationships are seen as isolated phenomena to a relationship perspective which emphasizes interdependence, connectedness and intimate relations (Mentzer *et al.*, 2001; Gellynck and Molnár, 2009; Molnár *et al.*, 2010). This is because, a good supply chain relationship quality is viewed as a crucial precursor to a stable exchange relationship that ensures relationship continuity and success (Ambrose *et al.*, 2010). Even though the need to establish successful supply chain relationships has gained more importance in contemporary business practice, managing these supply chain relationships continues to be a challenge for many firms (Nyaga *et al.*, 2013). It is therefore important that supply chain members understand their strategic relationships with critical supply chain partners in order to maximise the value of their relationships (Chen and Paulraj, 2004a; Ambrose *et al.*, 2010).

The need for good supply chain relationship management is even more important in circumstances where specific investments are high and contractual governance alone cannot guarantee compliance (Morgan and Hunt, 1994; Williamson, 2008). This is the case with the maize supply chain, wherein the effectiveness of contracts is subdued by weak institutional framework. Consequently, having contracts alone cannot ensure conformance and hence the need to have good relationships amongst supply chain members. In such situations, it is important that all parties perceive that they are benefiting from the relationship if the relationship is to continue and be successful.

This chapter focuses on the perception of supply chain relationship quality and how it influences supply chain performance. Specifically, we assessed the perceived influence supply chain relationship quality on supply chain performance. This is done through examining a matched triad relationship to identify specific differences in perceptions of the influence of

relationship quality on SCP between the upstream and downstream of the supply chain. Our argument is that supply chain performance measurement should be a composite of performance evaluations of relevant supply chain members. Measuring supply chain level performance is important because of three main reasons: i) assists in gauging supply member's contribution to SCP; ii) helps to rationalize the continuation of participation of supply chain members in a relationship; and iii) forms the basis for understanding and sharing of joint relationship benefits among supply chain members. As Wu *et al.* (2010) argues, looking at a triad facilitates a better understanding of the relational behaviour of a firm embedded in a supply chain. In the subsequent sections, we present the theoretical perspectives and develop the hypothesis used, describe the methods, analysis, results, discussions, conclusions, and the limitations and directions for future research.

2.2 Theoretical perspectives and hypothesis

This chapter merits from the transaction cost economics (TCE) and social network theory (SNT). Both TCE and SNT are useful foundations for the prediction of relationship dynamics and its success factors in supply chains. Transaction cost economics proposes that transactions are better managed internally, or through close relationships with other supply chain members when governance of transaction is difficult (Williamson, 2008). The TCE states that the governance of relationships will be predicted by the degree of asset specificity, the environmental and behavioural uncertainty surrounding the transactions, and the scope for opportunism that may exist (Williamson, 1985). In this regard, it is only be possible for one supply chain member to make relationship specific investment when the other partner attenuates the hazards of opportunism by also making relationship specific investments or offering contractual guarantees (Anderson and Weitz, 1992).

Of particular interest in this chapter is the TCE's notion of uncertainty and opportunism. Due to differentiated supply chain positions, supply chain members have unequal access to information and this creates a high degree of uncertainty. These uncertainties mainly relate to

quality of the products and market prices. Consequently, there are possibilities for opportunistic behaviours by supply chain members. In these circumstances, contractual governance alone may not work, hence a need to have collaborative relationships with supply chain partners. In the contexts where collaborative approach works better than contractual relationships, it is important to have a social network in the supply chain. The need for a good social network is explained by the social network theory, which suggests that firms strive for closer relationships with other supply members when mutual benefits can be achieved. These benefits can be derived from inter-dependencies or complementarities, or when access to knowledge, resources, markets or technology is sought (Wynstra *et al.*, 2015). Consequently, a good supply chain network is viewed as a resource that provides mutual performance benefits to supply chain members.

2.2.1 Hypothesis development

Firms invest resources in the development, maintenance and improvement of supply chain relationships because these relationships offer operational and financial benefits to them (Nyaga *et al.*, 2013). Empirical studies suggests that collaborative supply chain relationships is often associated with better performance in terms of cost reduction, coordination, and reduced inventory (Fynes *et al.*, 2008; Molnár *et al.*, 2010; Whipple *et al.*, 2010; Wu *et al.*, 2010). Supply chain relationship quality is the overall assessment of the strength of a relationship and the degree to which the needs and desires of the supply chain members are met, as well as the depth and atmosphere of an exchange relationship (Dwyer *et al.*, 1987; Crosby *et al.*, 1990; Johnson, 1999; Naudé and Buttle, 2000; Woo and Ennew, 2004; Srinivasan *et al.*, 2011). Being a higher level construct, we measure relationship quality using seven constructs of trust, commitment, information sharing, coercive power, non-coercive power, dependency and conflict. In the subsequent sub-sections, we discuss each of these constructs and their hypothesised relationship with supply chain performance.

Trust

Trust is the supply chain member's belief that another member will perform actions that will result into positive outcomes, as well as not take unexpected actions that would result into negative outcomes for the supply chain member (Anderson and Narus, 1990; Ganesan, 1994). Supply chain management literature suggests that firms involved in trust relationships are more likely to perform well due to the belief that in the long run, rewards will be fairly shared (Mohr and Spekman, 1994; Monczka *et al.*, 1998; Geyskens *et al.*, 1999; Fynes *et al.*, 2005a; Terpend and Ashenbaum, 2012). Trust amongst supply chain members has therefore been widely suggested as an important determinant of relationship success (Anderson and Narus, 1990; Gellynck *et al.*, 2007; Lu *et al.*, 2008; Molnár *et al.*, 2010; Terpend and Ashenbaum, 2012; Kühne *et al.*, 2013). Trust operates as a governing mechanism that allows supply chain members to share information and mitigate opportunism in business relationships characterised by uncertainty (Claro, 2009). Therefore, by building trust, supply chain members are able to reduce the transactions costs associated with monitoring, contracting and punishing opportunistic behaviours (Ganesan, 1994). The argument is that trust results into greater openness amongst supply chain members and hence a greater appreciation of the contribution of each other to the relationship (Corsten and Kumar, 2005). Consequently, supply chain members who trust each other will put in more effort to ensure the relationship continuity, hence relationship success.

We therefore hypothesise that:

H₁: High level of trust will result in a higher perception of supply chain performance

Commitment

Supply chain management literature defines commitment as an implicit or explicit pledge of relationship continuity amongst supply chain members (Dwyer *et al.*, 1987; Morgan and Hunt, 1994). It is the willingness of supply chain members to exert efforts on behalf of the relationship. Committed supply chain members are less likely to exit the relationship than the less committed members. Consequently commitment has been hypothesised to reduce the

transaction costs of doing business amongst supply chain members (Cechin *et al.*, 2013). Commitment therefore functions to ensure that future orientation of supply chain members enables them to build relationships that can stand un-foreseen problems (Mohr and Spekman, 1994; Monczka *et al.*, 1998). As an important dimension of RQ, Hennig-Thurau *et al.* (2002) considers commitment as a critical indicator of successful relationship amongst supply chain members. Because commitment results into mutual gains for all supply chain members (Anderson and Weitz, 1992), performance improvements is often possible when supply chain members commit to each other in long-term relationships (Krause *et al.*, 2007). Previous studies have shown that the perception of commitment positively influence the evaluation of supply chain performance amongst supply chain members (Jap and Ganesan, 2000; Prahinski and Benton, 2004; Krause *et al.*, 2007; Nyaga *et al.*, 2010).

We therefore hypothesise that:

H₂: High levels of commitment should lead to a higher perception of supply chain performance

Information sharing

Information sharing refers to the extent to which critical, and often proprietary formal and informal information is shared amongst supply chain members (Anderson and Narus, 1990; Mohr and Spekman, 1994). Kwon and Suh (2004) argue that information sharing is essential in the trust building process. This is because sharing of critical information enables firms to develop an understanding of each other's routines and develop mechanisms of conflict resolution, which signals that a supply chain member can be trusted. Information sharing is seen as one of the critical factors for successful SCM (Baihaqi and Sohal, 2013; Ganesh *et al.*, 2014). Through information sharing, supply chain members are able to reduce the risks associated with incomplete and asymmetric information, cut down on lead time, reduce the transaction costs and hence increase SCP (Baihaqi and Sohal, 2013; Ganesh *et al.*, 2014). Frequent and timely information sharing helps to resolve disputes and align expectations and perceptions along the entire supply chain (Morgan and Hunt, 1994). Consequently, information sharing is critical in ensuring that partners realise the benefits of a collaboration

(DeFoliart and Paoletti, 2005). The forgoing literature suggests that sharing of information amongst supply chain members should have a positive influence on SCP.

We therefore hypothesise that:

H₃: High levels of Information sharing should lead to a higher perception of supply chain performance

Power

Power, the ability or potential to influence the behaviour of others is an important basis for supply chain relationships (Abele *et al.*, 2007; He *et al.*, 2013). Power can be intentionally activated, or have an effect just because of the knowledge that it exists (Ireland and Webb, 2007; Reimann and Ketchen, 2017). While SCM literature highlights the benefits of collaborative relationships, the balance of power amongst the involved parties have an influence on how these benefits are shared (Crook and Combs, 2007; Chicksand, 2015; Reimann and Ketchen, 2017). The use of power has therefore been identified as one of the most important determinants of SCP (Geyskens *et al.*, 1999; Terpend and Ashenbaum, 2012; Nyaga *et al.*, 2013). Empirical studies indicate that coercive and non-coercive power have consequences on supply chain performance. Because coercive power occurs when a supply chain member's power enables him/her to affect another supply chain member's share of the benefits of collaboration for his/her own benefits, it has been postulated to negatively influence SCP (Zhao *et al.*, 2008; Pulles *et al.*, 2014). On the other hand, non-coercive power, which involves use of rewards and assistance, has been postulated to increase the value of the relationship through team support and common interests as well as promoting collective goals (Geyskens and Steenkamp, 2000; Jonsson and Zineldin, 2003; Nyaga *et al.*, 2013).

Basing on these literature streams, we therefore hypothesise that:

H₄: The use of coercive power should negatively influence the perception of SCP; and

H₅: The use of non-coercive power should positively influence the perception of SCP.

Dependence

Dependence is an indicator of the extent to which a supply chain member depends on his/her supply partners (Jonsson and Zineldin, 2003). The dependency as well as the interaction between the supply chain members is influenced by the atmosphere of the specific environment in which they operate (Robicheaux and Elansary, 1977). The atmosphere is in turn influenced by the characteristics of the supply chain partners, and hence the nature of interactions that exist amongst them. Relationship atmosphere can affect the relationships positively or negatively. Relationship atmosphere can be described in term of power-dependence relationships that exist or emerges over the life of a relationship (Jonsson and Zineldin, 2003). Consequently, the power of one supply chain member over the other will be based on the dependency of the other supply chain member. The dependent member therefore needs to maintain the relationship in order to achieve the desired goals, and this often comes in form of cooperation (Skinner *et al.*, 1992).

As such dependency is related to cooperation and should therefore result into a better perception of performance (Terpend and Krause, 2015). This is because dependency may arise as a results of making asset-specific investments that would increase the switching cost for the supply chain member (Ganesan, 1994; Jap and Ganesan, 2000). Alternatively, higher dependence of a supplier on a buyer may suggest being promised an increased reward in future. Such conditions will increase the suppliers motivation to perform well because its seeks to receive the reward and secure the incentive in the long run (Terpend and Krause, 2015). Empirical studies such as Terpend and Krause (2015) suggests that high levels of dependency is associated with a higher perception of SCP.

We therefore hypothesise that:

H₆: A higher level of dependency should lead to a higher perception of supply chain performance

Conflict

Conflict represents the overall level of disagreements that exist in a supply chain. As such conflict is determined by the frequency, intensity and duration of disagreements amongst supply chain members (Jonsson and Zineldin, 2003). Conflict amongst supply chain members can arise due to rivalry or differences in perceptions amongst supply chain members. Rivalry normally occurs when individual supply chain members' goals differs from each other; while perceptual differences usually arise due expectation divergences, role clarity and non-fulfilment of roles. Conflict has been postulated as an important determinant of SCP (Pearson and Monoky, 1976; Gailey and Young, 2012). Because the needs of supply chain members often change with time, conflicts can occur when one member is not supportive of the proposed change. As such it is important to effectively manage conflicts in a supply chain (Gailey and Young, 2012). The presence of conflicting goals amongst supply chain members may dictate a win-lose situation rather than the preferred win-win situation for business partners, and consequently compromise SCP (Weaver, 2009; Gailey and Young, 2012). Consequently, conflict has been postulated to negatively influence SCP (Gailey and Young, 2012).

We therefore hypothesis that:

H₇: Higher levels of conflict will lead to a lower perception of supply chain performance

2.2.3 Control variables

In testing the conceptual model (Figure 5), we controlled for business age and firm size. This is because firm size and business age (number of years in business) can influence the performance of a supply chain member. As observed in chapter 1, larger firms could have a performance advantage over smaller firms due to better access to capital, better bargaining power, access to market information and economies of scale (Cavusgil and Nevin, 1981; Christensen *et al.*, 1987; Ambler *et al.*, 1999). Previous authors such as Nyaga *et al.* (2013) and Fynes *et al.* (2008) have acknowledged the potential role of firm size in influencing SCP, and hence the need to control for them when analysing supply chain relationships.

For business age, being engaged in business relationship for a long time implies that there are performance benefits that are being realized, otherwise supply chain members would quit non-performing relationships. Supply chain management literature also points to the fact that supply chain members involved in long-term relationships are expected to perform better than those involved in short-term relationships (Batt, 2004; Medlin, 2006; Reynolds *et al.*, 2009). Consequently, business age and firm size are expected to confound the perceived influence of RQ on SCP. Controlling for firm size and relationship duration would therefore reduce their confounding effects on SCP. It therefore means that, when looking at the perceived influence of RQ on SCP, the potential confounding effects of firm size and focal firm are held constant, and alternative explanations for the observed relationships are ruled out (Colvin *et al.*, 2001; Becker, 2005).

The relationships investigated in this chapter are depicted in the conceptual framework (Figure 5) below.

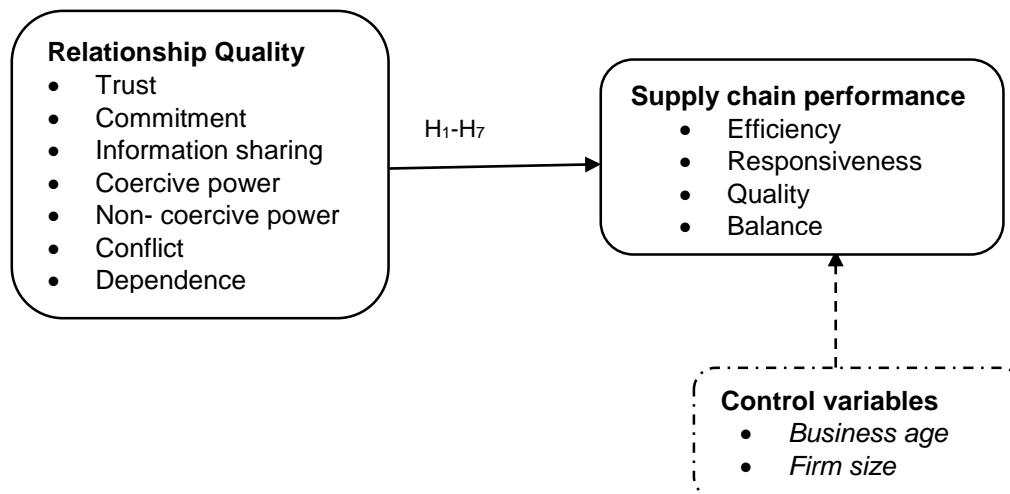


Figure 5: Conceptual framework

2.3 Methodology

This study was conducted in the context of the maize supply chain in Uganda. Details of the study context is described under section 1.2. Approaches to data collection, sampling and sample characteristics, and measurement properties used in this study are described in

chapter 1, under sections 1.7.1, 1.7.2, and 1.7.3. For the purpose of this chapter, we only present details of data analysis which are peculiar to this chapter.

Firm size and business age was used as control variables in this chapter. Business age was measured by the number of completed years a supply chain member has been in business operation. Firm size was measured by the number of formally employed people in the business at the time of the interview. The choice of the number of employees as a measure of firm size was guided by the fact that it was the only construct which we could get the most accurate response from the respondents, compared to other indicators like turn over. The use of number of employees as an indicator of firm size is also justified by the fact that other authors (such as d'Amboise and Muldowney, 1988; Baird *et al.*, 1994; Park and Krishnan, 2001; Fynes *et al.*, 2008; UBOS, 2014) have claimed that it is the most objective indicator of firm size.

2.3.1. Analysis

Content validity of the constructs used to measure SCP and RQ was supported by previous literature and pre-tests. After data collection, a number of tests were performed to assess the validity and reliability of the constructs.

Exploratory factor analysis

Because the constructs were being used in a different context (Uganda) from which they have been developed and mainly tested, we first conducted an exploratory factor analysis (EFA) with principal component analysis (PCA) to assess the uni-dimensionality of the constructs (Narasimhan and Jayaram, 1998; Zhao *et al.*, 2008). The EFA was done without specifying the number of factors. Varimax rotation with Kaiser normalization was used to clarify on the factors (Janssens *et al.*, 2008). Some measurement items were dropped, either due to cross loadings or low factor loadings on the different constructs in an iterative process. Cronbach alpha was then calculated for each factor extracted so as to assess the internal consistency of the extracted components.

Table 4: Exploratory factor analysis for relationship quality

Construct	Factor loading	Eigenvalues	Cronbach's alpha
Trust (TR)		2.83	0.76
Our XX keeps their promises (TR1)	0.71		
Our company has high confidence in our XX (TR2)	0.74		
We believe that the information our XX provides us is always correct (TR3)	0.53		
This XX have invested considerable effort and resources in building this relationship (CM4)	0.62		
This XX informs us in advance of any changing needs (IS1)	0.55		
This XX is expected to provide us with any information which might be helpful for our business operations (IS2)	0.49		
This XX shares information with our company frequently (IS4)	0.61		
Commitment (CM)		1.94	0.68
We expect our relationship with this XX to continue for a long time (CM1)	0.77		
We would like to continue to cooperate with this XX (CM2)	0.80		
We expect our relationship with this XX to strengthen over time (CM3)	0.65		
Dependency (DEP)		1.15	
Our company is significantly dependant on this XX's capabilities (DEP2)	0.92		
Non-coercive power (NCP)		1.84	0.67
Our company receives benefits from this XX when we regularly meet their requirements (e.g. financial support, market information)(NCP1)	0.87		
This XX rewards our company without requiring specific behaviour in return (e.g. financial support, better prices)(NCP2)	0.86		
Coercive power (CP)		1.51	0.91
We can't be sure that our XX will not retaliate on our company (terminate the contract /lower prices) when we do not accept their business proposals (CP1)	0.95		
We can't be sure that our XX will not neglect our interests (e.g. terminate the contract without any notice) even if we fully meet the conditions detailed in the contract with them (CP2)	0.96		
Conflict (CON)		1.1	
Our business interests does not match with that of this XX (CON2)	0.81		
<ul style="list-style-type: none"> • <i>KMO=0.77; Bartlett's tests of sphericity: $X^2=826.95$; $p=0.000$</i> • <i>During the interview process, XX in the statements would be replaced with supplier, customer, or focal firm to represent the F-S, F-C; and C-F and S-F contexts respectively.</i> 			

For RQ, six factors were extracted with Eigenvalues greater than 1.0, explaining 65% variations in RQ. The new RQ constructs generally maintained the original construction except for factor one (trust), which combined the original trust and information sharing items plus one commitment item. In the iterative process, dependency and conflict were represented by one latent variables each, hence a one factor solution was adopted for the two constructs in the subsequent analysis stages (Table 4).

For SCP, EFA yielded a four factor solutions with eigenvalues greater than 1, explaining 64% variation in observed SCP constructs. Similar to RQ, some items were dropped due to low factor loadings. The new SCP constructs generally maintained their original dimensions in which it was measured (Table 5).

Table 5: Factor analysis for SCP

Construct	Factor loading	Eigen values	Cronbach's alpha
<i>Efficiency (EFF)</i>			
Doing business with this XX helps my company to lower transport costs significantly (EFF1)	0.80	1.77	0.60
Doing business with this XX helps my company to maintain acceptable profitability (EFF2)	0.53		
Doing business with this XX helps our company to significantly reduce transaction costs (EFF3)	0.75		
<i>Responsiveness (RES)</i>			
Doing business with this XX helps my company to reduce lead time (time from sending/getting the request till reply) (RES1)	0.69	1.43	0.45
Doing business with this XX enable our company to deliver products on time (RES3)	0.83		
<i>Quality (QUA)</i>			
Doing business with this XX contributes to reducing customer/consumer complaints (QUA1)	0.76	1.37	0.50
Doing business with our XX helps my company to manage product safety (QUA2)	0.77		
<i>Chain balance (BAL)</i>			
Doing business with this XX contributes to a more balanced distribution of risks and benefits along the chain (BAL1)	0.77	1.19	0.25
Doing business with this XX helps my company to better understand other chain members' interests (BAL2)	0.70		
<ul style="list-style-type: none"> • <i>KMO=0.66; Bartlets test of spericity: $X^2=189.202$; $p\text{-value}=0.000$</i> • <i>During the interview process, XX in the statements would be replaced with supplier, customer and focal firm to represent the F-S, F-C; and C-F and S-F contexts respectively.</i> 			

Structural equations modelling

Following Anderson and Gerbing (1988), we used a two-step approach of testing measurement and structural models in estimating standardized path estimates for the hypothesized relationships. A measurement model was built for the six RQ and four SCP constructs that was extracted in the EFA process. We also included the two control variables of business age and firm size in the measurement model (Figure 6). The measurement model was adjusted through removing items with low loadings (<0.5 ; $CR<1.9$) on the respective latent variables in an iterative process. In the process, chain balance was dropped out of the measurement model because the loading of observed variables on the latent variable were

both below the recommended 0.5 threshold (Hair *et al.*, 2006; Janssens *et al.*, 2008). The decision to drop chain balance was also guided by the fact that chain balance had low Cronbach alpha values (see table 5). The final measurement model (Figure 6) had the following fit indices: $\chi^2= 272.98$; $p=0.000$, $\chi^2/df=1.54$; GFI=0.90, AGFI=0.84; IFI=0.92, TLI=0.87, CFI=0.91, RMSEA=0.053, SMRM=0.061. All these fit indices are within the acceptable levels, indicating the measurement model exhibits both convergent and discriminant validity (Hu and Bentler, 1999; Janssens *et al.*, 2008).

A structural model based on the measurement model was then estimated using the maximum likelihood method. The structural model was modified through co-varying the error terms on efficiency with quality, and the on trust constructs. The final structural model had fit indices of $\chi^2=266.158$, $p=0.000$, $\chi^2/df=1.495$, GFI=0.90, AGFI=0.84, CFI=0.92, IFI=0.92, TLI=0.88, RMSEA=0.05, and SRMR=0.059. These indices are all within the acceptable range for a structural model (Hu and Bentler, 1999).

The last step of the analyses involved conducting a partial analysis to assess the upstream and downstream perceptions of supply chain relationships. This was done through estimating a multi-group SEM (MSEM) on the four perspectives (S-F, F-S, F-C, and C-F,) which were used in data collection. The MSEM was used to ascertain whether the hypothesised relationships were equivalent across the different supply chain positions, as well as between the upstream and downstream of the supply chain, hence allowing for group comparisons (Deng and Yuan, 2015).

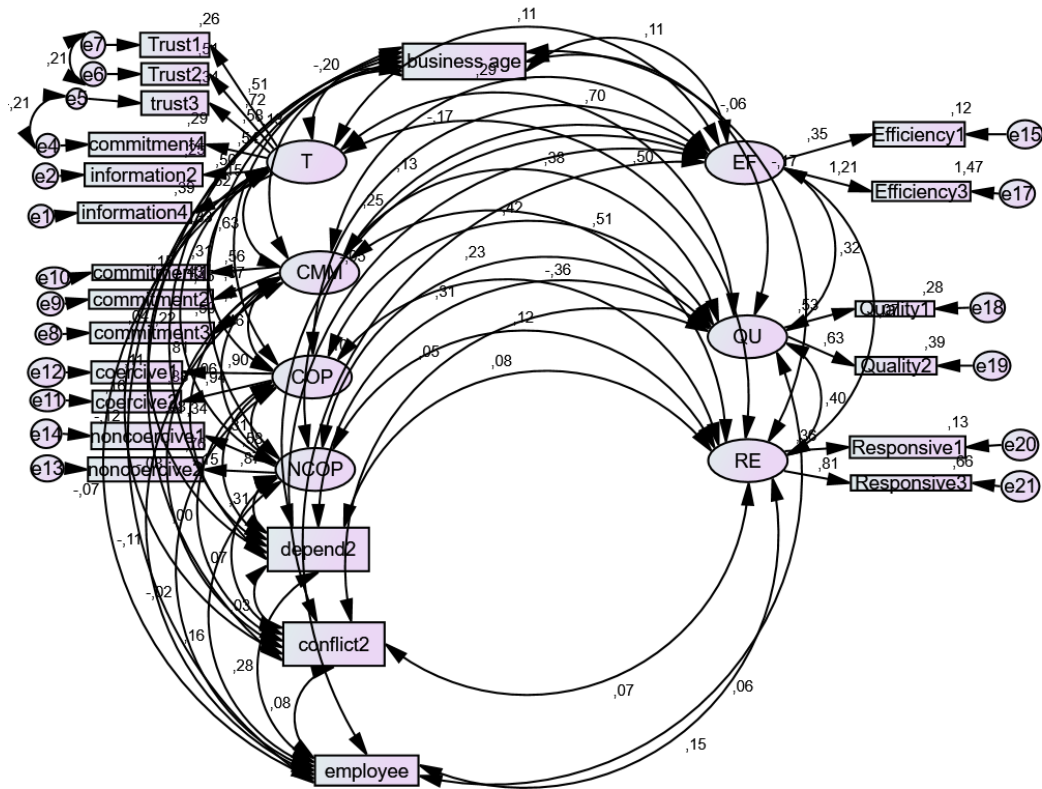


Figure 6: Measurement Model

2.4 Results

Pooled sample results revealed seven significant paths with trust positively associated with quality and responsiveness; commitment positively related to responsiveness3 and efficiency, dependency positively associated with efficiency and quality; and firm size positively associated with responsiveness (Figure 7).

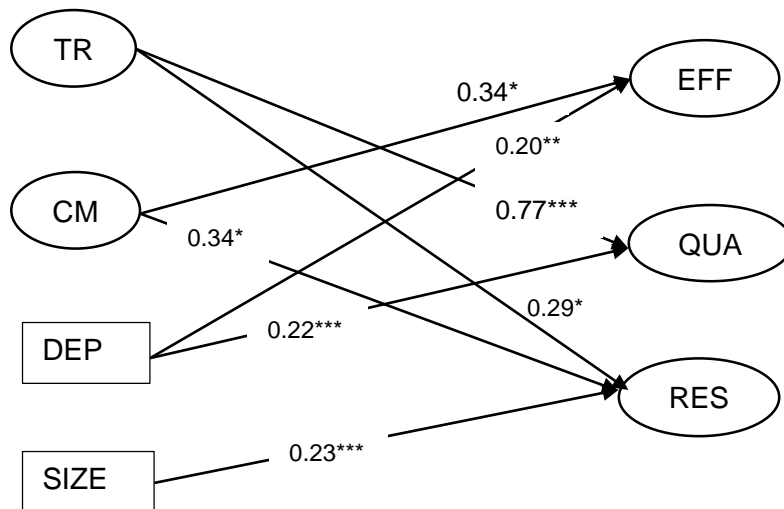


Figure 7: Significant paths estimates for the pooled sample

Note: *, **, ***, indicates significance at 0.05, 0.01 and 0.00 respectively

To understand whether the perceived influence of RQ on SCP varies amongst supply chain members, as well as between the upstream and downstream of the supply chain, we conducted a MSEM on specific causal paths. Results of the MSEM suggested that there were differences in perceptions between the upstream and downstream of the supply chain as well as amongst the supply chain members (Table 6).

Table 6: Standardized path estimation for MSEM

<i>Paths and perspectives</i>		<i>Standardised Estimates</i>				
		<i>Pooled</i>	<i>S-F</i>	<i>F-S</i>	<i>F-C</i>	<i>C-F</i>
Trust	Efficiency	-0.12	0.63	-0.08	-0.37	0.46*
	Quality	0.77***	1.39*	-0.48	1.30	1.95*
	Responsiveness	0.29*	1.51	-1.63	0.52	0.76***
Commitment	Efficiency	0.34*	-1.46	-0.10	0.38	-0.41
	Quality	-0.16	-1.22	0.29	-0.41	-1.43
	Responsiveness	0.34*	5.97	0.73	0.24	-0.07
Coercive power	Efficiency	-0.04	-1.23*	0.17	0.11	0.11
	Quality	-0.15	-0.98	0.12	-0.16	0.14
	Responsiveness	-0.08	4.59*	1.69	0.02	-0.23
Non-coercive power	Efficiency	0.03	0.21*	0.25	0.32	0.01
	Quality	-0.09	0.15	1.12	-0.75	-0.15
	Responsiveness	0.01	-0.30	3.84	-0.06	-0.15
Dependence	Efficiency	0.20*	0.07	0.03	0.14	0.12
	Quality	-0.21**	0.26	-0.00	0.26	0.66**
	Responsiveness	-0.02	2.68**	-0.57	-0.58*	0.21
Conflict	Efficiency	-0.05	-0.38	0.11*	-0.16	0.01
	Quality	0.125	0.04	-0.34	0.31	0.30
	Responsiveness	0.12	1.75	-0.16	0.12	0.18
<i>Control Variables</i>						
Firm size	Efficiency	0.06	-0.63	-0.13	-0.08	-0.05
	Quality	0.34	-0.47	-0.45	-0.04	-0.23
	Responsiveness	0.23*	3.09*	-0.18	0.51*	-0.13
Business age	Efficiency	0.09	0.47	-0.14*	-0.24	0.11*
	Quality	0.08	0.05	-0.77	1.04	0.16
	Responsiveness	-0.11	-2.37*	-2.43	-0.21	0.24

, **, * indicates significance at 0.05, 0.01 and 0.00 respectively*

On the upstream (S-F, F-S), suppliers perceived trust, coercive power, non-coercive power, dependence, as well as firm size and business age to significantly influence SCP with respect to the focal firms. On the other hand, focal firms perceived conflict and business age as critical factors influencing SCP with respect to their suppliers. On the downstream, focal firms considered dependence and firm size as significant factors, while customers considered trust, dependence and business age to be important relationship quality aspects that influences SCP

with respect to focal firms (Table 6). These findings highlight the fact that there are perceptual differences amongst supply members regarding which relationship aspects are considered significant in influencing SCP.

2.5 Discussions

The general consensus in mainstream SCM literature is that good supply chain relationships is a critical precursor for a successful supply chain relationship. However, measurement of supply chain level performance has recently attracted a lot of interest and debate amongst SCM scholars. While the predominant discourse has been to use a dyad as a unit of theory and analysis, there is a growing call for a shift to a triad as a basic unit of supply chain analysis (Choi and Wu, 2009a; Molnar, 2010). Using evidence from a triadic agribusiness supply chain in a developing country context, this chapter contributes to this debate by looking at the supply chain members' perception of how their relationship quality contribute to their individual as well as the performance of the whole supply chain.

With regards to the measurement of RQ and SCP, we find support for the existing measurement construction approaches. However, we also find evidence that information sharing is part of trust. This suggests that sharing of accurate and timely information amongst supply chain members is considered to be an indication of trust. This result finds support from literature on trust within the agribusiness supply chain which suggest that trust allows supply chain members to be confident in their interpretation of market signals from supply partners (Micheels and Gow, 2011). Sharing of critical and proprietary information has been known to enable supply chain members develop an understanding of each other's routines, develop mechanisms to resolve conflicts which indicates that a supply chain partner can be trusted (Baihaqi and Sohal, 2013; Ganesh *et al.*, 2014).

Results from pooled sample analysis indicates that trust was positively associated with quality and responsiveness; commitment was positively associated with efficiency and

responsiveness; and dependency was positively associated with efficiency and quality. These findings underscore the fact that better relationship quality can lead to better supply chain performance (Lindgreen *et al.*, 2008; Schiefer *et al.*, 2009b; Molnár *et al.*, 2010; Kühne *et al.*, 2013). This implies therefore that supply chain members can improve their performance through developing and maintaining good relationships with their supply chain partners. While previous studies identified empirical support for the positive association between RQ and SCP using dyadic frameworks (e.g. Fynes *et al.*, 2008; Nyaga *et al.*, 2013), our findings extend this fact to agribusiness supply chains in triadic settings.

The findings also underscore the nature of business relationships in the maize supply chain in Uganda. With product quality being suspicious, supply chain members have to rely on trusted partners to deliver the right products. The maize supply chain is also characterised by a high degree of opportunism. Often, suppliers have the option of selling their products to other buyers, if they offer a higher price in the market. This opportunistic tendency is exacerbated by the information asymmetry that exists regarding the prices and product quality. Consequently, buyers can only rely on committed suppliers to deliver products based on agreed terms and conditions. Therefore, through trust and commitment, supply chain members are able to reduce transactions costs associated with monitoring (inspecting products for quality conformance), contract enforcement and punishing opportunistic behaviours, hence an increase in supply chain performance (Ganesan, 1994; Claro, 2009; Cechin *et al.*, 2013).

The positive relationship between dependence and efficiency and quality can be explained by the characteristics of the maize supply chain members, and hence the nature of business interactions amongst them. Due to the existence of information asymmetry regarding quality and prices, supply chain members have to rely on trusted and committed partners in order to succeed. To ensure this, focal firms for instance, have to promise suppliers rewards such as higher prices for better quality. This promise would motivate suppliers to perform well (e.g. deliver quality products) as they will seek to receive the rewards that accrues from it (Terpend

and Krause, 2015). The positive relationship between dependency and performance can also be attributed to the power-dependence relationships amongst supply chain members. Due to the advantages of size and information access, focal firms are in a powerful position compared to their suppliers and customers. As such, suppliers and customers have to depend on the focal firms in order to maintain the relationship and achieve the desired performance goals. This dependency often comes in form of increased cooperation from the suppliers and customers in their business relationships with the focal firms. Through this power-dependency, increased performance can be realised for all supply chain members (Skinner *et al.*, 1992; Jonsson and Zineldin, 2003).

The power-dependency relationships also explain the positive association between firm size and responsiveness. Focal firms are generally bigger than suppliers and customers, especially in terms of operational capacity. This size advantage give the focal firm privileged access to capital, market information, as well as knowledge of the market, which are sources of market power in the supply chain. Because of this power advantage that the focal firm holds, suppliers and customers have to depend on the focal firm in order to succeed in their business operations. For instance, suppliers generally deal in raw, unprocessed products (grains) while customers generally deal in processed products of specific quality standards. The focal firms therefore fill the gap (structural hole) the between suppliers and customers through transforming the unprocessed products from the suppliers to the processed products of specific quality standards demanded by the customers. Consequently, suppliers and customers have to rely on the focal firm in order to be successful in their business operations.

Downstream and upstream perceptions

Results with respect to upstream and downstream perceptions of relationship quality and its influence on SCP shows that there is asymmetry between the two sides of the supply chain. On the upstream, trust, coercive power, non-coercive power, and dependency were regarded as critical RQ parameters. Upstream supply chain business transactions are generally

informal, spot market based arrangements. Here, products usually pass through several traders before reaching the focal firm. These market characteristics increases the possibilities of opportunism and hence the transaction costs. Because focal firms are always suspicious of the quality of the products they get from suppliers, they will offer lower prices to suppliers. Paying a lower price for poor quality is a punishment/coercion for not conforming to agreed terms and conditions, hence the negative association between coercive power an efficiency. However, if quality is improved and/or guaranteed due to trust between the focal firm and the supplier, suppliers are offered higher prices, which is a reward, hence the positive association between non-coercive power and efficiency.

The informal nature of business operations in the upstream complicates the management of business operations due to uncertainty and opportunism according to the TCE (Williamson, 2008). Under these circumstances, focal firms use their power positions to achieve desired behaviours and performance goals in the supply chain. As such, focal firms are able to ensure cooperation from the suppliers, who depend on them to succeed in their business operations. This further suggests the exercise of power-dependence between focal firms and their suppliers. A higher dependence is equivalent to being promised an increased reward, as such this will increase the motivation to perform well so as to receive the reward and secure the motivation in the long run (Terpend and Krause, 2015).

On the downstream, customers perceived the presence of trust to positively influence SCP. Downstream business operations are generally formal in nature, with formally registered business operations. This allows for contractual agreements to be arranged and monitored between the focal firms and the customers. Because contracts are enforceable, focal firms and customers can have trust that their business partners will not act opportunistically (Williamson, 2008). Empirical evidence suggests that when trust and contracts are combined in an exchange relationship, SCP improves (Morgan and Hunt, 1994; Watabaji *et al.*, 2016). Besides the known benefits of trust (Fynes *et al.*, 2008; Molnár *et al.*, 2010; Kühne *et al.*, 2013),

contracts mitigate against the risks of uncertainties in exchange relationships (Brown *et al.*, 1996; Williamson, 2008). This could explain the positive association between trust and SCP.

The lack of symmetry between the upstream and downstream also illustrates the pivotal role of the focal firm in a three-tier triadic supply chain. Most of the significant relationships are based on the perceptions of either the supplier, or the customer on the focal firm (Table 6). This suggests that the focal firm controls the behaviours of both the suppliers and customers to ensure conformance and performance in the supply chain. This, according to the structural-hole concept, benefits the focal firm as it plays the broker role in the supply chain (Burt, 1992; Madhavan *et al.*, 2004). By cooperating with the focal firm, both suppliers and customers also stand to benefit from the relationship through increased SCP. Through exercising coercive and/or non-coercive power in their relationship with suppliers, focal firms also play the role of balancing the supply chain. From the balance theory perspective, if suppliers deliver poor quality products, they create mistrust, which unbalances the supply chain and consequently they are punished through lower prices. This punishment should enable suppliers conform in the subsequent business transactions in order to regain the trust of the focal firm, hence creating a new balance in the supply chain.

2.6 Conclusions and implications

Several conclusions regarding management of supply chain relationships can be drawn from the findings of this study. Firstly, the triadic conceptualization adopted in this study goes beyond the scope of most previous SCM studies that predominantly collect and analyse data from a single supply chain perspective using the focal firm approach. The shift in analysis from dyad to triad, especially the assessment of the downstream and upstream perceptual differences further adds a new dimension to the analysis of supply chain relationships and their outcomes. Secondly, the fact that there was lack of symmetry between the downstream and the upstream proves the relevance of using a triad as a unit of theory and analysis in SCM

research. Consequently, this gives credence to the use of the triadic approach especially in agribusiness supply chains with similar characteristics as the one investigated in this study.

Thirdly, the observed asymmetry between the upstream and downstream suggest mechanisms through which a supply chain can link its informal and formal markets segments. While formal markets operations are managed based on contracts and trust; informal market operations are managed through power-dependency relationships and trust. We also observed that the success of these supply chains management mechanism will depend on the construction of trust, commitment and power in the supply chain. Additionally, this results also highlight the pivotal role of the focal firm in linking the formal and informal markets segments, through switching the management approaches depending on the nature of the supply chain partner in question.

Fourthly, the fact that better RQ was perceived to positively influence SCP suggest that agribusiness SMEs would greatly benefit from building good supply chain relationships with their supply chain partners. This is more important in circumstances where formal contracts alone cannot ensure conformity and avert opportunistic behaviour. However, while building a mutually beneficial relationship is critical, it is also important to have an understanding of how the other supply chain members view the relationship for it to succeed.

2.7 Limitations and future research

This chapter focused on one agribusiness supply chain in one Country-Uganda. Therefore, these findings can only be taken as a first indicator of the perceived influence RQ on SCP in the developing country context. Consequently, generalisation of these results to the entire agribusiness SMEs population should be done cautiously. Future studies could confirm these results using datasets covering more than one agribusiness supply chain in more than one country. Such studies could compare differences in RQ perception amongst different supply chains and countries. Additionally, this study did not consider the different typologies of

transaction (e.g. contracts, spot market) along the supply chain. This dimension, if taken into consideration in future studies could provide some insights into whether the nature of relationships amongst supply chain members varies depending on the nature of transaction or governance structure adopted. Whereas our results highlight the significant role RQ on improving SCP, our sample size (150) was small, largely due to the complexities of triadic data collection process. Consequently, these results deserve further considerations in similar contexts using a larger sample sizes.

Chapter 3

Relating Supply Chain Performance and Satisfaction

Based on:

Odongo, W., Dora, M., Molnár, A., Ongeng, D., & Gellynck, X. Effect of supply chain performance on supply chain satisfaction: Evidence from Agribusiness SMEs.
Under review with Outlook on Agriculture.

Odongo, W., Dora, M., Molnár, A., Ongeng, D., & Gellynck, X. Effect of supply chain performance on supply chain satisfaction. 11th International European Forum – Igls-Forum, 13-17 February 2017 (161st EAAE Seminar) on Systems dynamics and innovations in Food networks.

3. Relating supply chain performance and satisfaction

3.1 Introduction

Relationship marketing literature emphasise the benefits of being part of a long-term and sustainable business relationship, especially for agribusiness firms (Batt, 2004; Reynolds *et al.*, 2009; Whipple *et al.*, 2010). The argument is that long-term relationships stimulate benefits to individual supply chain members as well as to the entire supply chain (Medlin, 2006). Such benefits include members' commitment (Gyau and Spiller, 2008); information sharing (Batt, 2004), reduced transaction costs (Williamson, 1979); reduced market uncertainties (Heide and Stump, 1995); and improved business performance (Ganesan, 1994; Kalwani and Narayandas, 1995; Boniface *et al.*, 2010). Consequently, due to its benefits, as well as the high costs involved in establishing new and sustainable relationships, supply chain members are less likely to quit existing relationships (Dwyer, 1980).

Empirical supply chain management (SCM) literature have emphasised the importance of satisfaction in the development and maintenance of these long-term supply chain relationships (Hunt and Nevin, 1974; Dwyer *et al.*, 1987; Ganesan, 1994; Selnes, 1998; Geyskens and Steenkamp, 2000; Chumpitaz Caceres and Papparoidamis, 2007; Sahadev, 2008; Briggs *et al.*, 2016). These studies suggest that satisfaction plays an important role in the development of competitive strategies, influencing customer purchase intentions, and loyalty, that eventually leads to improved SCP (Boniface *et al.*, 2012). As a behavioural outcome, Robicheaux and Elansary (1977) suggest that satisfaction is intricately related to SCP. When supply chain members are satisfied, they have high moral and incentive for continued participation in collective supply chain activities (Geyskens *et al.*, 1999; Field and Meile, 2008). According to Robicheaux and Elansary (1977), satisfaction encourages performance, which in turn encourage satisfaction. As such, satisfaction is considered an important outcome of supply chain relationships (Dwyer, 1980; Stank *et al.*, 1999; Geyskens and Steenkamp, 2000).

Although research on satisfaction in supply chains has expanded in the recent past (Briggs *et al.*, 2016), two key issues remain inadequately addressed, and motivates the choice of this study. Firstly, although a triad is considered to be the smallest representation of a supply chain (Mentzer *et al.*, 2001; Choi and Wu, 2009b; Molnár *et al.*, 2011; Rollins and Schreiner, 2015), most previous satisfaction studies have collected data only from a single supply chain position, using the focal firm approach (Rossomme, 2003; Odongo *et al.*, 2016). The triadic chain perspective of supply chain relationships (as opposed to focal firm or dyadic relationships within a supply chain perspective) has therefore not been adequately examined or tested in satisfaction studies (Havila *et al.*, 2004; Wu *et al.*, 2010; Nyaga *et al.*, 2013). Furthermore, because relationships are bidirectional in nature, using the focal firm approach limits the assessment of perceptual differences amongst supply chain members (Choi and Wu, 2009a; Molnár *et al.*, 2010; Minna Rollins and Schreiner, 2015). To fill these gaps, we argue that satisfaction measures in a supply chain perspective should be a composite of satisfaction evaluations of relevant supply chain members spanning a minimum of three echelons (Rossomme, 2003; Molnár *et al.*, 2010).

Secondly, given the importance of having a good supply chain relationship, supply chain members often focus on building long-term, strategic relationships with their partners (Kotabe *et al.*, 2003; Chen and Paulraj, 2004a; Prajogo and Olhager, 2012). However, managing these business relationships encompass coping with different circumstances at different times (Fynes *et al.*, 2008), and there seems to be a no “one size fits all” situation. We investigate the maize supply chain characterised by duality of informal upstream and formal downstream relationships. These variations in the nature of supply chain relationships between the downstream and upstream could provide an insight into why some relationships work, while others do not. At the same time, this provide and understanding to how such formal/informal duality is managed in a supply chain context. Relationship characteristics have been postulated to moderate supply chain relationships and their outcomes (Fynes *et al.*, 2008; Wagner and Bode, 2008; Lavastre *et al.*, 2012). Although these moderating factors are

inherent in supply chains, current knowledge of their effect of performance is quite limited and empirical research are scarce and mostly descriptive (Harland *et al.*, 2003; Fynes *et al.*, 2004; Hallikas *et al.*, 2004; Wagner and Bode, 2008; Srinivasan *et al.*, 2011; Lavastre *et al.*, 2012).

In this chapter, we assess the potential moderation effects of relationship characteristics on the association between SCP and satisfaction. Specifically, we analyse the potential moderating effects of relationship duration and firm size on the relationship between SCP and satisfaction. These relationships are assessed at a supply chain level, as well as at the downstream and upstream in a triadic agribusiness supply chain. The subsequent sections of this chapter are structured as follows: the next section outlines the theoretical perspectives and hypotheses underlying the study, this is followed by presentation of the methodology used, results, discussions, conclusions and the implications arising from the study.

3.2 Theoretical perspectives and hypotheses

To facilitate understanding of the moderating role of relationship characteristics on the association between SCP and satisfaction, we looked into the transaction cost economics (TCE) and the resource dependency theory (RDT). Transaction cost economics view supply chain relationships as governance structures to reduce the effect of uncertainty and asset specificity associated with business transactions (Williamson, 1979; Williamson, 1985). Even though TCE initially dealt with dyadic level relationships and did not encompass supply chain level analysis, recent practices in TCE have shifted from dyadic to supply chain level analysis and its implication on transaction costs (Hobbs, 1996; Spekman *et al.*, 1998; Fynes *et al.*, 2004; Flynn and Flynn, 2005). This is because the predominant view of supply chain relationships have moved from the transaction cost economizing dyadic perspective to the relationships perspective, which stresses interdependence, connectedness and intimate relationships (Ellram and Cooper, 1990; Harland, 1996; Fynes *et al.*, 2008). Consequently, TCE has been used in studying triadic supply chain relationships and its outcomes (Wynstra *et al.*, 2015).

The shift to the relational approach to business management implies that supply chain members have to rely on each other if they are to be successful. The reliance of supply chain members on each other's resources is explained by the resource dependence theory (Pfeffer and Salancik, 1978). The resource dependence theory (RDT) proposes that firms depend on each other because it is not feasible to be self-sufficient and cost effective at the same time (Pfeffer and Salancik, 1978; Belaya and Hanf, 2011a; Wynstra *et al.*, 2015). Hence, supply chain members collaborate so as to use each other's resources in a business relationship (Cai *et al.*, 2013; Murthy and Paul, 2016). According to the RDT, the extent to which a supply chain member is dependent on another member is contingent upon the uniqueness of the resource, and the extent of monopoly over it. Therefore business managers have to make best possible use of the resources that they possess so as to operate optimally (Pfeffer and Salancik, 1978).

We believe that the TCE and the RDT provides sufficient understanding of the relationship between SCP and satisfaction in triadic agribusiness supply. This is because of their focus on triads, and the fact that they have been applied in similar studies before (Fynes *et al.*, 2005b; Adams *et al.*, 2012; Sanfiel-Fumero *et al.*, 2012; Cai *et al.*, 2013; Chicksand, 2015; Liu *et al.*, 2015). The application of the RDT and TCE in this chapter is therefore relevant and important in advancing the conceptual and practical understanding of the relationship between SCP and satisfaction in triadic agribusiness SMEs.

3.2.1 Supply chain performance and satisfaction

We follow Geyskens *et al.* (1999) to define satisfaction as a supply chain member's appraisal of all outcomes of his/her business relationships with the other supply chain members. Supply chain satisfaction has been widely studied as a two-dimensional construct, consisting of both economic and social dimensions (Geyskens and Steenkamp, 2000; del Bosque Rodríguez *et al.*, 2006; Molnár *et al.*, 2010; Nyaga *et al.*, 2010). Economic satisfaction refers to the business partner's positive emotional reaction to the economic rewards such as turnover and profits that result from a business relationship (Geyskens and Steenkamp, 2000; Jap and Ganesan,

2000). Social satisfaction refers to a business partner's evaluation of the psychological aspects of a relationship. It measures the extent to which the relationship with a business partner is perceived to be fulfilling, gratifying and facile (Geyskens and Steenkamp, 2000). These two dimensions of satisfaction are however, not mutually interdependent. Geyskens and Steenkamp (2000) argue that the activities of a supply chain member may for instance provide a business partner with economic satisfaction but not social satisfaction, and therefore it is necessary, in satisfaction research to make a distinction between the economic and social dimensions.

Previous studies in marketing, operations, logistics and service sectors provide a considerable support for the link between SCP and satisfaction (Reichheld and Sasser, 1989; Cronin Jr and Taylor, 1992; Skinner *et al.*, 1992; Innis and La Londe, 1994; Leuthesser and Kohli, 1995; Daugherty *et al.*, 1998; Stank *et al.*, 1999; Geyskens and Steenkamp, 2000; Benton and Maloni, 2005; Nyaga *et al.*, 2010). For instance, in the industrial service sector, Stank *et al.* (1999) show that both relational and operational performance positively affects satisfaction; in logistics, both operational and relational performance have been found to positively influence satisfaction (Innis and La Londe, 1994; Daugherty *et al.*, 1998); and in marketing, service quality has been identified as an antecedent of satisfaction (Cronin Jr and Taylor, 1992; Leuthesser and Kohli, 1995). The rationale is that operational outcomes such as efficiency should lead to relational outcomes such as satisfaction (Stank *et al.*, 1999). These studies suggest that as operational performance increases, a supply chain member should respond positively by working more closely with its partners and thereby ensuring more future revenues and resulting satisfaction.

Basing on the forgoing literature review, we posit that:

H_{1a}: Supply chain performance will have a positive effect on economic satisfaction; and

H_{1b}: Supply chain performance will have a positive effect on social satisfaction.

3.2.2 Firm size as a moderator

We define firm size as the number of formal employees in a business enterprise (Fynes *et al.*, 2008; MTIC, 2014). Empirical studies have provided conflicting evidence on the influence of firm size on performance. On the one hand, some studies have shown a positive relationship between firm size and performance. These studies attribute the success of larger firms over smaller ones to the availability of greater resources, better bargaining power, and economies of scale (Cavusgil and Nevin, 1981; Christensen *et al.*, 1987; Ambler *et al.*, 1999). On the other hand, authors such as Bilkey and Tesar (1977) found that firm size had no significant effect on firm performance, while Cooper and Kleinschmidt (1985) found that size had a negative effect on firm performance. This literature points to the fact that firm size might have an influence on firm performance.

Within the context of this study, there is variation amongst supply chain members based on their size. Large firms have the advantage of privileged access to capital, market information, as well as knowledge of the market, which puts them in a powerful market position in the supply chain. By having a large operating capital for instance implies that smaller firms will rely on large ones to access trade credit or advance payments if they are to increase/improve their business operations and hence performance. In a supply chain characterised by weak institutional framework, firm size could therefore have performance benefits to larger farms as opposed to the small firms. As such, a relatively bigger supplier stands to lose more if the relationship is terminated than a smaller supplier. Consequently, bigger firms will be expected to work towards ensuring relationship continuity and success. Basing on the above literature and the nature of business transactions in the maize supply chain, we conclude that firm size can moderate the relationship between SCP and satisfaction.

Accordingly, we posit:

H_{2a}: The perceived influence of SCP on economic satisfaction will be stronger for large firms;

H_{2b}: The perceived influence of SCP on social satisfaction will be stronger for large firms.

3.2.3 Relationship duration as a moderator

Business relationships are social bonds, as such, it usually takes time for supply chain members to develop the familiarity and expertise necessary to know when, and how to draw on each other's resources (Fynes *et al.*, 2008). Additionally, business relationships encompass roles, most of which have to be learnt; the process of learning and developing these roles, and shaping the related rewards and sanctions also requires time. While new relationships may rely on social interaction amongst strangers, long-term relationships are based on stable ties. Consequently, business partners in long-term supply chain relationships are expected to have developed social systems and are familiar with each other's performance expectations (Fichman and Levinthal, 1991). Previous studies have postulated that the benefits of business relationships increase with relationship duration (Kotabe *et al.*, 2003; Fynes *et al.*, 2008). For instance, long-term relationships may motivate supply chain members to make asset specific investments since there is an established trust amongst business partners (Prajogo and Olhager, 2012).

Long-term relationships are based on trusts amongst supply chain members. The existence of trust amongst supply chain members minimises transaction costs associated with opportunistic behaviours and specific investments (Williamson, 2008). Consequently, in a supply chain characterised by informal market arrangements, long-term business relationships are critical for business success (Odongo *et al.*, 2016). A long-standing relationship in an informal business environment could suggest that trust and quality problems have been successfully solved. Therefore, relationship duration can influence the performance of supply chain relationships and hence the satisfaction that accrues from it.

Accordingly, we posit that:

H_{3a}: The perceived influence of SCP on economic satisfaction will be stronger for long-term relationships; and

H_{3b}: The perceived influence of SCP on social satisfaction will be stronger in long-term relationships.

3.2.3 Upstream and downstream perceptions

Although most researchers believe that supply chain relationships involve triadic interactions (Spekman *et al.*, 1998; Mentzer *et al.*, 2001; Choi and Wu, 2009b; Molnár *et al.*, 2010; Wu *et al.*, 2010; Kühne *et al.*, 2013), there is a dearth of empirical studies analysing these triadic relationships (Nyaga *et al.*, 2013). Most SCM studies asks a single supply chain member, usually the focal firm, to provide answers to both independent and dependent variables using the same data collection tool (e.g. Fynes *et al.*, 2005a; Fynes *et al.*, 2005b; Fynes *et al.*, 2008; Srinivasan *et al.*, 2011). This approach to data collection and analysis has been criticized to have potentials for inflated empirical relationships (Bagozzi, 1980; Rungtusanatham *et al.*, 2003a). In fact, by focusing on the dyad as a unit of theory and analysis, researchers implicitly or explicitly suggests that for the constructs of interest, the respective perspectives or experience of individual supply chain members in a relationship is sufficiently similar, such that the dyadic relationship is appropriate for theory and analysis (Klein and Kozlowski, 2000). As such, this approach only shows one-dimensional perception of supply chain relationship since they seek the views of only one member (focal firm) and ignores the views of the other members (Uzzi, 1997; Fynes *et al.*, 2008; Molnár *et al.*, 2010). Indeed, the very basis of supply chain relationships is that by working collaboratively with supply chain partners, each supply chain member will gain more than they otherwise would individually.

Due to the limitations associated with using the focal firm approach, authors such as Mentzer *et al.* (2000), Rungtusanatham *et al.* (2003a), and Choi and Wu (2009a) have advocated for the use of the triadic approach to data collection and analysis. Analysing supply chain relationships from multiple supply chain members' perspective is important because business relationships are bi-directional. As such, it is expected that supply chain members will differ in their perception of supply chain relationships and its outcomes (Gagalyuk *et al.*, 2013; Petrick *et al.*, 2016). The difference in perception raises the question of perceived benefits from supply chain relationships as well (Medlin, 2006; Whipple *et al.*, 2010). For instance, Corsten and Kumar (2005) found that, although both suppliers and customers benefited from a collaborative

relationship, there was a greater feeling of inequality amongst suppliers. This implies that suppliers believed that they receive less than they deserve from the relationship, hence a suspicion amongst suppliers regarding relationship parity. Consequently, it is important to assess the perception of all supply chain members, so as to better understand the dynamics of supply chain relationships (Ambrose *et al.*, 2010; Nyaga *et al.*, 2013).

Following the foregoing discussions, we posit that:

H₄: The perceived influence of SCP on satisfaction will differ between the downstream and upstream of the supply chain

The hypothesized relationships are depicted in the conceptual framework in Figure 9

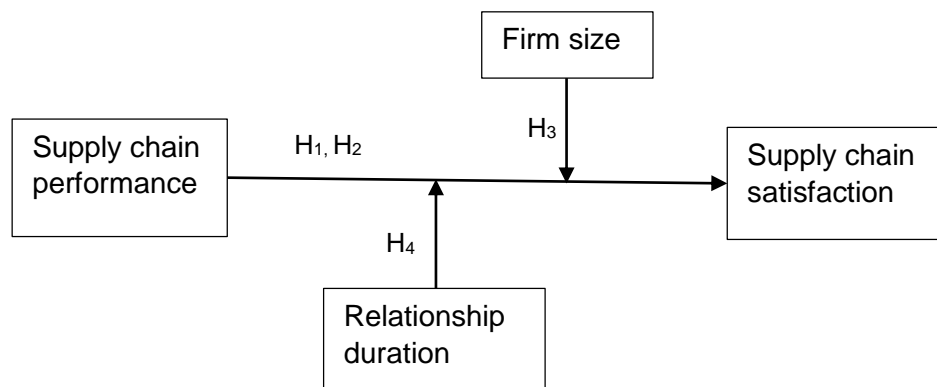


Figure 8: Conceptual framework

3.3 Methodology

This study was conducted in the context of the maize supply chain in Uganda. Details of the study context is described under section 1.2. Approaches to data collection, sampling and sample characteristics, and measurement properties used in this study are described in chapter 1, under sections 1.7.1, 1.7.2, and 1.7.3. For the purpose of this chapter, we only present details of data analysis which are peculiar to this chapter.

3.3.1 Analysis

Exploratory factor analysis

Construct reliabilities for SCP constructs was based on the EFA as conducted in chapter 2. For satisfaction, the EFA extracted two factors representing the social and economic dimensions of satisfaction (Table 7). The internal consistency across the items was confirmed by satisfactory Cronbach's alpha values (Table 7). Since the Cronbach alpha values for chain balance, quality and responsiveness were low (<0.6), suggesting the items measuring them could not be combined into one item due to poor internal consistency, we adopted one factor solutions for each of these constructs. Following the reliability tests, we computed summative scores for efficiency, as well as for social satisfaction and economic satisfaction. Summative scores were computed as means of the contributing items. For instance, the summative score for efficiency was computed by summing EFF1, EFF2 and EFF3 and dividing the outcome by three. A similar approach was followed in the calculation of summative scores for economic satisfaction and social satisfaction.

Table 7: Measurement constructs and reliabilities

Construct	Factor loading	Eigenvalues	Cronbach's alpha
<i>Efficiency</i>		1.77	0.60
EFF1	0.80		
EFF2	0.53		
EFF3	0.75		
<i>Responsiveness</i>		1.43	0.45
RES1	0.69		
RES3	0.83		
<i>Quality</i>		1.37	0.50
QUA1	0.76		
QUA2	0.77		
<i>Chain balance</i>		1.19	0.25
BAL1	0.77		
BAL2	0.70		
Social satisfaction		1.77	0.61
SS1	0.68		
SS3	0.68		
SS4	0.85		
Economic satisfaction		1.65	0.60
ES2	0.67		
ES3	0.78		
ES4	0.74		

Structural equations modelling

The first stage of analysis was to estimate the standardised path coefficients for the structural model. To achieve this, we ran a SEM model using multi-group SEM (MSEM) technique. Using this approach, we were able to assess and compare the upstream (F-S; S-F) and downstream (F-C; C-F) perspectives. The fit indices for this model were good; with $\chi^2/df=2.75$, $p\text{-value}=0.017$, GFI=0.98, AGFI =0.78, CFI=0.96, RMSEA=0.067, and SRMR=0.017, indicating that the model was a good fit for the data (Janssens *et al.*, 2008; Byrne, 2016).

The next stage of the analysis was to test for the moderation effects of firm size and relationship duration on the relationship between SCP and satisfaction. To achieve this, we aggregated efficiency, responsiveness, quality and chain balance to calculate a score for SCP. While we acknowledge that this aggregation limits our analysis of individual causal paths in the moderation model, this was the best approach to conduct the moderation assessment (Fynes *et al.*, 2008; Byrne, 2016). In order to test for moderation effects of relationship duration and firm size, we first conducted a chi-square test to ensure that the moderator variables were statistically different from each other. We then used the MSEM to test for the moderation effects of firm size and relationship duration. Next, we standardize the independent variables, i.e. firm size, relationship duration and SCP. We then created an interaction variable for each moderator, i.e. size*SCP (size moderator) and relationship duration*SCP (duration moderator). These two interaction variables were then added to the path analysis for estimation as well (Figure 10). The model was then estimated to assess if the two relationship characteristic variables moderates the perceived effects of SCP on satisfaction. The fit indices for this model were: $\chi^2/df=3.17$, $p\text{-value}=0.007$, CFI=0.93, GFI=0.99, AGFI=0.78, RMSEA=0.078, and SRMR=0.028, which are generally within the acceptable range for a structural model (Janssens *et al.*, 2008; Byrne, 2016).

3.4 Results

Our findings gave partial support to the proposition that SCP was positively associated with significant ($p=0.000$) and positive relationship between SCP and economic satisfaction. The path for SCP and social satisfaction was negative and not significant, and hence inconclusive (Figure 9).

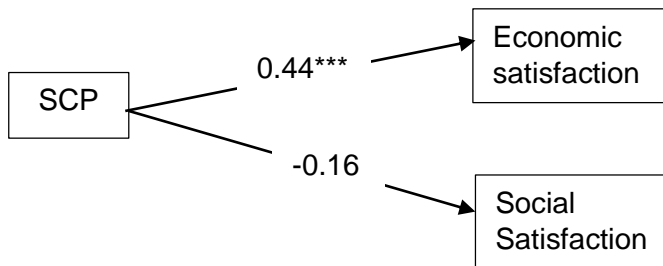


Figure 9: Overall model

Pooled sample results show that efficiency and quality was positively associated with economic satisfaction, while chain balance was positively associated with both social and economic satisfaction (Table 8). Partial analysis results gave support to our proposition that the perceived association between SCP and satisfaction differs between the downstream and upstream of the supply chain. On the upstream, both the focal firms and suppliers perceived chain balance to positively influence social satisfaction. However, suppliers differed from focal firms in the sense that they perceived efficiency to negatively influence social satisfaction, and quality to positively influence economic satisfaction. Focal firms on the other hand perceived chain balance to positively influence both social and economic satisfaction. On the downstream, the point of agreement between the focal firms and customers was that efficiency positively influence economic satisfaction. However, they also differed on the fact that focal firms perceived chain balance to positively influence social satisfaction, while customers perceived quality to positively influence economic satisfaction (Table 8).

Table 8: Pooled and partial analysis results

Perspective		Standardised Estimates				
		<i>Pooled</i>	<i>S-F</i>	<i>F-S</i>	<i>F-C</i>	<i>C-F</i>
Efficiency	Social satisfaction	-0.043	-0.404***	0.231	0.152	-0.104
	Economic satisfaction	0.171***	0.012	0.049	0.272***	0.310***
Quality	Social satisfaction	-0.200	0.130	-0.474	-0.079	-0.054
	Economic satisfaction	0.252***	0.391***	0.140	0.156	0.405*
Responsiveness	Social satisfaction	-0.099	0.048	-0.065	-0.140	-0.105
	Economic satisfaction	0.020	0.144	-0.144	-0.145	0.164
Chain balance	Social satisfaction	0.395***	0.411*	0.589*	0.701***	-0.177
	Economic satisfaction	0.156*	0.060	0.315*	0.070	0.003

Note: *, **, ***, indicates significance at 0.05, 0.01 and 0.00 respectively

With regards to moderation effects, we find no support for the proposed moderation effects of firm size and relationship duration on the relationship between SCP and satisfaction (Figure 10). This suggests that the relationship between SCP and satisfaction may not be contingent upon firm size or relationship duration.

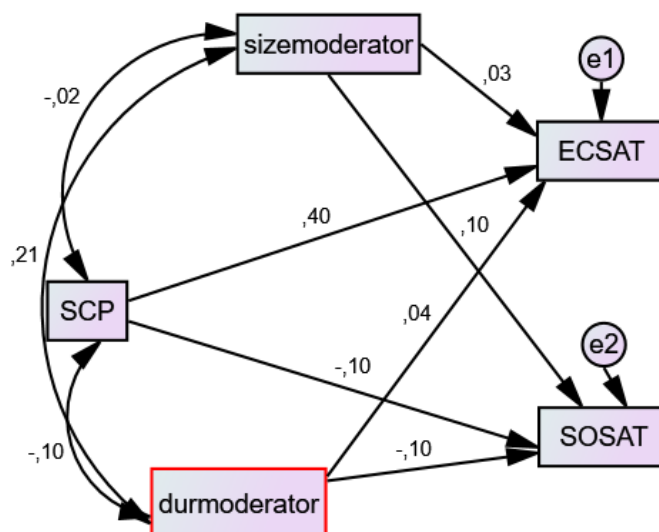


Figure 10: Moderation model

3.5 Discussions

This chapter assessed the potential moderation effects of firm size and relationship duration on the association between SCP and satisfaction. Our findings provide interesting insights into the link between SCP and satisfaction in the context of agribusiness SMEs. Supply chain

members perceived SCP to have a positive effect on economic satisfaction and not social satisfaction. In fact, the relationship between SCP and social satisfaction was negative, in contrast to our hypothesis. This results suggest that operational outcomes, such as turnover, profits, and market position are the important factors influencing satisfaction of supply chain members. Previous studies such as Stank *et al.* (1999) also give credence to the positive association between SCP and satisfaction. This result is in line with the standard economic assumption of profit maximisation from business operations (Geyskens and Steenkamp, 2000; Jap and Ganesan, 2000). Consequently, improvements in efficiency and quality is expected to increase profits and turnover, and hence economic satisfaction.

The negative association between SCP and social satisfaction could suggest that while supply chain members are happy with the economic outcomes of their business relationships, they may not be happy with the psychological aspects of it. As such, they do not perceive the business relationship outcomes to be fulfilling and gratifying. Although economic and social satisfaction are related, the two are not mutually interdependent (Geyskens and Steenkamp, 2000). In this case, the negative relationship between SCP and social satisfaction implies that the business relationship outcomes provide supply chain members with economic satisfaction, but not social satisfaction. This fact is underlined by the fact that chain balance was perceived to positively influence both social and economic satisfaction (Table 8). This is because perceived fairness is an important value, especially for the informal business environment. As such, besides focusing on performance improvements, supply chain members would appreciate business partners who empathise with their situations and risks in doing business.

Since satisfaction is perceived to be an important prerequisite for developing and maintaining long-term relationships (Benton and Maloni, 2005; Ulaga and Eggert, 2006), it is important that supply chain members establish and understand the operational and emotional needs of their supply chain partners. This is because by so doing, they are able to focus on the means to achieve satisfaction and ensure business relationship success that satisfies all parties

involved. For agribusiness SMEs, this implies that adhering to the agreed performance matrix such as delivery time, quality specification, as well as the alignment of motivation along the supply chain will lead to satisfaction of all supply chain members and hence improved and continued supply chain relationships.

Our results demonstrate the existence of perceptual differences between the upstream and downstream. On the downstream, the positive association between efficiency and economic satisfaction reflects the traditional economic value of profit maximisation. Consequently, if operational performance, such as profits, turnover is realised, supply chain members are happy (economic satisfaction). Because downstream business interactions in the Ugandan maize supply chain is characterised by formal business arrangements, it is possible for business partners to enter and enforce contractual agreements. The institutionalisation of downstream business operations also implies that supply chain goals and motivation can be aligned between the focal firms and the customers (Daly *et al.*, 2016). Because goals can be aligned, it implies that quality problems can be solved and as such supply chain members can focus on their operational performance.

On the upstream, chain balance was perceived to positively influence social satisfaction. Upstream business transaction involves focal firms informally dealing with several suppliers, most of whom are small scale farmers and itinerant traders. Consequently, there is misalignment of motivation, lack of coordination and communication between the focal firms and suppliers. Since most suppliers operate small businesses, and lack adequate financing and proper storage and processing facilities, they have urgent cash needs and lack motivation to produce high quality products (Daly *et al.*, 2016). In such situations, perceived fairness is highly valued by the suppliers and hence the positive association between chain balance and satisfaction.

Quality was perceived to positively influence economic satisfaction in both markets. In the informal upstream, guaranteeing quality is a big problem, as such, solving quality problems will be mutually beneficial to both parties. This is because suppliers will receive higher prices for quality products, while focal firms will get good value for money and a reduction in transaction costs. In the formal downstream, ensuring quality is the responsibility of the seller (focal firm), if the quality is poor, they lose customers (poor performance), hence economic satisfaction drops. For customers, when quality is guaranteed, transaction costs of monitoring is reduced, and there is good value for money, hence economic satisfaction is high.

The observation that relationship duration does not moderate the relationship between SCP and satisfaction underscores the generally informal and spot market nature of business operations in the maize supply chain. Because firms rely on spot market transactions, with several small traders, the chances of repeating a particular transaction over a long period of time is very small (Daly *et al.*, 2016; Gelaw *et al.*, 2016; Maestrini *et al.*, 2017). As such, a particular business transaction may improve SCP, but because it is short lived, there is no emotional attachment to it, hence low satisfaction. This result also highlight how differences in business contexts can influence supply chain relationships management approaches. Supply chain management literature suggests that SCP should improve with relationship duration (Fynes *et al.*,2008). This is because in long-term relationships, supply chain members have stronger ties and as such understand each other's operational procedures and performance expectations (Fichman and Levinthal, 1991; Kotabe *et al.*, 2003; Fynes *et al.*, 2008; Prajogo and Olhager, 2012). Ultimately, firms in long-term relationships are expected to outperform those in short term relationships, hence the resulting economic and social satisfaction. However, these relationships have mostly been tested in developed economies, where formal market institutions exist, and may not be the same in the informal market economy with weak institutional arrangements, as in the case of the maize supply chain in Uganda.

Although we find evidence that firm size influences SCP in chapter 2, our results in this chapter suggest that firm size, does not moderate the relationships between SCP and satisfaction. In the maize supply chain, relatively large firms have a power advantage over small firms (see chapter 1,2). Consequently, the interaction between the large and small firms is based on a power-dependence relationship. Therefore, while large firms may outperform small firms through exploiting their power positions (size advantage), this improvement in performance may be at the expense of the emotions of the smaller supply chain members, hence low satisfaction. For instance, a small supplier may be coerced to improve product quality by the focal firm. Although a better quality product will attract a higher price (higher profits) for the supplier, suppliers may not be happy with being coerced to supply these better quality products. Therefore, while the performance of both suppliers and focal firms may improve, the improved performance may not translate into satisfaction of all supply chain members.

3.6 Conclusions and implications

The increased emphasis on satisfaction in SCM literature underscores its importance in establishing and maintaining long-term business relationships. This chapter provides an understanding of the relationship between SCP and satisfaction, and the role of relationship characteristics as moderators. From the findings, the following conclusion can be drawn. The observed positive association between SCP and economic satisfaction emphasises the assumption that having stronger and better relationships is a resource that can be utilised by supply chain members to improve their own performance as well as the performance of the entire supply chain. We also conclude that while supply chain members may be economically satisfied with the performance of the supply chain, they may not be socially satisfied with it at the same time. This finding therefore underscores the importance of making a distinction between economic and social satisfaction while analysing social relationships and their outcomes.

The observed differences in perception between the upstream and downstream, justifies the need to use of a triad as a unit of theory and analysis in SCM studies. Additionally, the difference in perceptions also highlights the manner in which a supply chain connects the formal and informal segments. For instance, while efficiency was highly valued in the formal downstream, fairness and understanding (balance) was valued in the informal upstream. The observation that relationship duration and firm size does not moderate the relationship between SCP and satisfaction provide evidence of the importance of contextual differences in the management of supply chain relationships. Consequently, the notion that improvements in business performance should make supply chain members satisfied may only be valid in situations where formal market institutions exist, and not when informal markets and weak institutional arrangements characterise business transactions. This points to the fact that successful SCM is context specific, and hence a need to understand and apply context specific mechanisms to realise success.

For agribusiness SMEs managers, this finding suggest that they should make tailor-made efforts to enhance specific performance aspects with respect to their suppliers and customers. Because business relationships vary depending on the characteristics of the market and the partners, what works with one partner may not necessarily work with another. As such, what satisfies a supplier may not be the same as what satisfies a customer in a business relationship. Understanding what satisfies each business partner is therefore important in building a stronger and long lasting supply chain relationships.

3.7 Limitations and future research

Some limitations of this study that would guide future studies are worth mentioning. This was a cross sectional study focusing on one agribusiness supply chain in one country. Consequently, this can limit the casual links and applications of the results to other contexts. Future research could explore the applicability of this model across two or more countries and supply chains. Future studies could also consider using longitudinal data to further underpin

the causal link between SCP and satisfaction that could not be done using the cross sectional data employed in this study. Additionally, we only focus on the potential moderating role of firm size and relationship duration. However, other relationship characteristics such as product type, demand and supply uncertainty could as well moderate supply chain relationship outcomes. Future studies could explore the moderating roles of these and other relationships characteristics.

Chapter 4

Influence of Power on Supply Chain Performance

Based on:

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4. Influence of power on supply chain performance

4.1 Introduction

The notion in contemporary supply chain management (SCM) literature is that firms of different sizes, offering a variety of products and services should work together in complex supply chain networks in order to succeed. As such, successful management of these relationships becomes more and more important for supply chain managers (Nyaga *et al.*, 2013). Supply chain management literature demonstrates that power is a vital predictor of SCP (Molnár *et al.*, 2010; Nyaga *et al.*, 2013), adoption (Liu *et al.*, 2015), innovation capacity (Kühne *et al.*, 2013), and customer integration (Zhao *et al.*, 2008). However, the presence of power asymmetry in the supply chain may affect supply chain members' collaborative behaviours (Nyaga *et al.*, 2013; Cuevas *et al.*, 2015; Rindt and Mouzas, 2015). This is because power asymmetry may encourage opportunism or possibilities of the stronger member appropriating a greater value of the relationship to themselves. Because differences in power is inevitable in supply chains (Johnson *et al.*, 1993; Nyaga *et al.*, 2013; Cuevas *et al.*, 2015; Rindt and Mouzas, 2015), it is important to understand the nature and the use of power in supply chain relationships.

Past studies suggest that supply chain members have differences in their perception of power and expectations in supply chain relationships (Corsten and Kumar, 2005; Ambrose *et al.*, 2010; Molnár *et al.*, 2010; Nyaga *et al.*, 2013; Odongo *et al.*, 2017). These differences in perception have been shown to have significant effects on supply chain performance (Johnson *et al.*, 1993). For instance, Matopoulos *et al.* (2007) argued that power imbalance may reduce collaborative activities, deters trust and hinder the intensity of business collaborations; Benton and Maloni (2005) found that power had significant effects on trust, cooperation, commitment and conflict resolution in the supply chain; and Nyaga *et al.* (2013) observed that situations of power asymmetry in supply chains can lead to less cooperation and greater conflict. These studies points to the fact that power has significant consequences in the formation and

maintenance of supply chain relationships and their outcomes. Consequently, it is important to understand how power is being perceived and used by supply chain members (Nyaga *et al.*, 2013; Rindt and Mouzas, 2015). This is because difference in the perception of power and its use can effect supply chain members' willingness to collaborate and hence SCP (Nyaga *et al.*, 2013).

This chapter makes two important contributions to SCM literature. Firstly, despite the importance of power in agribusiness supply chains (Park and Krishnan, 2001; Molnár *et al.*, 2010; Adams *et al.*, 2012; Sukwadi *et al.*, 2013), there are limited studies that have examined power influences in agribusiness SMEs (Adams *et al.*, 2012; Sukwadi *et al.*, 2013). We focus on an agribusiness supply chain characterised by a high degree of uncertainty regarding price and quality. This leads to higher chances of opportunistic behaviours amongst supply chain members (FEWSNET, 2017). Consequently, powerful members may take advantage of their power positions to appropriate a greater value of the relationship (Hingley, 2005; Nyaga *et al.*, 2013; Lackes *et al.*, 2015). Although the power advantage may initially benefit the stronger member, it may negatively impact the value generating potential of the relationship and damage the relationship irrevocably (Sakano and Johnson, 1993). It is therefore important for agribusiness SMEs to get a better understanding of the role of power and how to deal with it (Gelinias and Bigras, 2004; Matanda *et al.*, 2016).

The second contribution of this chapter lies in the fact that previous studies on power (e.g. Benton and Maloni, 2005; Crook and Combs, 2007; Zhao *et al.*, 2008; Nyaga *et al.*, 2013; Pulles *et al.*, 2014) have tended to focus on the dyad as a unit of theory and analysis. We argue that understanding power relations in a dyad is a first step toward understanding it in a complex supply chain network, which may be comprised of several interlinked dyads governed by different power relationships (Huo *et al.*, 2017; Odongo *et al.*, 2017). Consequently, the dyadic perspective only gives a limited understanding of the nature of power, its perception,

and use in a supply chain (Mentzer *et al.*, 2001; Rungtusanatham *et al.*, 2003a; Molnár *et al.*, 2010; Chicksand, 2015; Odongo *et al.*, 2016).

Using a triad as a unit of theory and analysis, this chapter investigated the perceived influence of power on SCP. Focusing on the triad as a unit of theory and analysis can facilitate a better understanding of how supply chain members perceive power use and its influence on performance (Belaya *et al.*, 2009; Liu *et al.*, 2015; Rollins and Schreiner, 2015). We hypothesize that the perception of power use and its influence on SCP is not the same across a relationship triad. The subsequent sections present the theoretical perspective and hypotheses guiding the study, this is followed by the methodology, results, discussions and conclusions and implications as well as limitations and future research drawn from the study.

4.2 Theoretical perspectives and hypotheses

To facilitate understanding of power relationships in a triadic supply chain, we based this chapter on the resource dependence theory (RDT) and the transaction cost economics (TCE). The RDT (Pfeffer and Salancik, 1978) is the most prominent theoretical position from which power in supply chains has been examined (Ireland and Webb, 2007; Huo *et al.*, 2017). The RDT propagates that firms depend on each other because it is not feasible to be self-sufficient and cost effective at the same time (Pfeffer and Salancik, 1978; Belaya and Hanf, 2011b; Wynstra *et al.*, 2015). Hence, businesses collaborate so as to use each other's resources (Cai *et al.*, 2013; Murthy and Paul, 2017). Because it views a firm as dependent on its external environment for resources to ensure survival, RDT looks at power as control over valued resources. In a supply chain context, such resources may include physical inputs such as operating capital, as well as intangibles such market information. According to the RDT, power asymmetry in supply chain therefore arises from a situation of one firm needing another firm's resources more than the other way around (Huo *et al.*, 2017). Because of this dependence asymmetry, RDT assumes that the more powerful firm can activate its power to serve its own interests and to the detriment of the other firms (Cuevas *et al.*, 2015).

The basic tenet of the RDT is that the perceived ability to use power, as well as the actual use of power is to the advantage of the more powerful firm and to the disadvantage of the less powerful firm (Fiol *et al.*, 2001; Ireland and Webb, 2007; Reimann and Ketchen, 2017). Within the context of the maize supply chain, access to and use of market information for instance is an important source of market power. The RDT is therefore relevant in this study and has been used in previous studies to assess power relationships in supply chains (Fynes *et al.*, 2005b; Ireland and Webb, 2007; Adams *et al.*, 2012; Sanfiel-Fumero *et al.*, 2012; Cai *et al.*, 2013; Chicksand, 2015; Liu *et al.*, 2015).

Transaction cost economics (Williamson, 1985; Williamson, 2008) is the most widely used theoretical framework in studying governance arrangements in inter-firm relationships (Nyaga *et al.*, 2013; Huo *et al.*, 2017). Transaction cost economics stipulates that firms seek the least cost arrangements that can safeguard their relationships (Rindfleisch and Heide, 1997). In the context of TCE, the risk of opportunism creates the need for formalised governance structures, and limits the effectiveness of relational governance in exchange relationships (Rindfleisch *et al.*, 2010). Of interest in this study context is the TCE's notion of asset specificity, which implies relationship specific adaptations. Because of their idiosyncratic nature, specific assets creates a safeguarding problem because market competition can no longer be used as restraint against opportunism by business partners (Geyskens *et al.*, 2006). Asset specificity can therefore lead to a shift in power positions and may encourage opportunism, which makes it difficult for business partners to achieved their goals (Nyaga *et al.*, 2013). In situations where significant power asymmetry exists, relationship adaptation puts the weaker supply chain member in a greater degree of vulnerability due to opportunism. The powerful firm may leverage power advantage to gain more at the expense of the weaker firm. With fewer options available, the weaker partner could be coerced to perform tasks or incur costs on behalf of the stronger partner.

4.2.1 Supply chain performance

We define SCP as the operational measures that improve for each member, as well as for the whole chain as a result of participation in a supply chain relationships (Akyuz and Erkan, 2010; Molnár *et al.*, 2010; Whipple *et al.*, 2010; Gagalyuk *et al.*, 2013). Previous studies have established that collaborative relationships are associated with improved SCP in terms of cost reduction, increased fill rate, reduced inventory, and improved quality (Molnár *et al.*, 2010; Nyaga *et al.*, 2010; Thomas *et al.*, 2011). Further, supply chain members require a positive evaluation of the performance outcomes of a relationship in order to justify continued involvement in collaborative activities (Wang *et al.*, 2010).

Even though collaborative relationships are expected to result into mutual gains, it is important to stress that these potential gains may not be equally shared amongst supply chain members. Previous studies provide evidence of perceptual differences amongst supply chain members with regard to the nature of relationships and SCP (Molnár *et al.*, 2010; Whipple *et al.*, 2010; Kühne *et al.*, 2013; Nyaga *et al.*, 2013). Anderson and Weitz (1992) showed that perceptual differences can negatively affect the relationships among chain members and result in dissatisfaction and conflict. Similarly, while buyers and suppliers can both benefit from collaborations, the distribution of these benefits may be disproportionate, hence a feeling of inequality may be present (Corsten and Kumar (2005). Moreover, supply chain members are likely to possess different sources of power and power positions, which can be used to create a certain level of stability or deterrence within the supply chain (Nyaga *et al.*, 2013; Rindt and Mouzas, 2015; Huo *et al.*, 2017).

4.2.2 Influence of power on supply chain performance

Power, the ability or potential to influence the behaviour of other firms (French *et al.*, 1959; Jonsson and Zineldin, 2003), is an important foundation of supply chain relationships (Cuevas *et al.*, 2015; Rindt and Mouzas, 2015). Power has been recognized as an important antecedent of SCP (Geyskens *et al.*, 1999). This is because possession and /or perceived existence of

power can influence a supply chain member's perception, conduct and/or decisions (Fiol *et al.*, 2001; Jonsson and Zineldin, 2003; Ireland and Webb, 2007). Empirical SCM research indicates that there is always a power imbalance amongst supply chain members owing to the existences of large firms with greater power than small ones (Cai *et al.*, 2013; Li *et al.*, 2013; Hingley *et al.*, 2015). Power imbalances may also arise due to differences in expertise, dependence, and the nature of contracts (Hingley, 2005; Belaya *et al.*, 2009; Gellynck and Molnár, 2009; Kühne *et al.*, 2013; Li *et al.*, 2013; Jones *et al.*, 2014). Due to its relevance in supply chain relationships, it is therefore important to understand the nature and influence of power in supply chains, as this can provide balanced benefit distributions for all supply chain members (Nyaga *et al.*, 2013).

Power can be intentionally activated or can have an effect simply because of the knowledge of its existence. For instance, firm A, may continuously supply firm B, which is large, and well known in the supply chain. The decision of firm A to supply B maybe influenced by B's power position in the chain, even though B does not intentionally activate this power. Because it refers to the ability or potential to influence, rather than the use of the influence strategies and tactics per se, Fiol *et al.* (2001) referred to power as a social construction whose perception exist in the eyes of the firm that is influenced. Therefore, while the right to reward or punish, or access information will obviously affect supply chain members' belief about power, the potential to influence also derives from perceivers recognition of them as sources of power (Fiol *et al.*, 2001).

A firm is subject to power from other firms in both its upstream and downstream of the supply chain. If it faces power with detrimental implications from one direction, there may be compensating beneficial effects of power from the other direction (Ireland and Webb, 2007). In the context of the maize supply chain in Uganda, processors and wholesalers usually have more resources (capital) and better access to market information as compared to their suppliers and customers. This unequal access to resources and information implies that focal

firms have a final say on purchasing decisions including pricing, quantity, and quality. Consequently, focal firms (processors and wholesalers) wield more power compared to their supply chain partners (supplier and customers). These powerful supply chain members might assume a greater influence and create some stability along the supply chain. Alternatively, powerful supply chain members may use their power advantage at the cost of the weaker members (Belaya *et al.*, 2009; Nyaga *et al.*, 2013; Cuevas *et al.*, 2015; Rindt and Mouzas, 2015). Due to their weak positions in the supply chain, the weaker members are most likely to comply with the stronger members for fear of losing business. To take into account the power position of the focal firm in terms of size and access to information in the supply chain, we include being a focal firm and firm size (Ireland and Webb, 2007; Nyaga *et al.*, 2013) as control variables in our conceptualisation and analysis (Figure 10).

Power bases examine the potential reasons why one supply chain member may hold authority over another. According to French *et al.* (1959), these power bases include: *coercive* and *non-coercive* which indicate the ability of the power holder to mediate punishments or dividends; *expert* power which is the perception that one member holds information or expertise which is valued by another; *referent* power, which is one member's desire for identification with another for recognition through association; and *legitimate* power where one member believes in the right of the other member to wield influence. Although power is a multidimensional construct, the coercive and non-coercive categorisation is the most apparent and widely recognized power bases (Maloni and Benton, 2000; Terpend and Ashenbaum, 2012; Bastl *et al.*, 2013; Nyaga *et al.*, 2013; Reimann and Ketchen, 2017). This categorisation encompasses the potential influence that can be used to evoke desired actions by business partners (Ireland and Webb, 2007).

Using the coercive/non-coercive dichotomy, we view power as a mechanism by which one supply chain member induces a desired action from another supply chain member by providing/withholding rewards or punishment. Coercive power occurs when a member's power

permits it to affect another member's share of the benefits of a supply relationship. Coercive power therefore concerns a members' control over negative outcomes relative to each other with the intention of gaining rewards either through punishment or threatened sanctions (Pulles *et al.*, 2014). It therefore represents a power struggle driven by force of one supply chain member over another (Skinner *et al.*, 1992). This power struggle may reduce the level of cooperation and performance; and increase the level of conflict and tension in a supply chain relationship hence reduced SCP (Terpend and Ashenbaum, 2012). Coercion is risky and may engender possibilities of retaliation and decreased reward for all supply chain members (Ireland and Webb, 2007). Past studies have shown that coercive power negatively influences SCP (Zhao *et al.*, 2008; Molnár *et al.*, 2010; Nyaga *et al.*, 2013).

We therefore hypothesize that:

- H1_a:** *The perceive use of coercive power will negatively influence efficiency;*
- H1_b:** *The perceive use of coercive power will negatively influence quality;*
- H1_c:** *The perceived use of coercive power will negatively influence responsiveness; and*
- H1_d:** *the perceived use of coercive power will negatively influence chain balance.*

Non-coercive power is based on rewards and the belief that another member is able to administer positive rewards and minimize negative rewards (French *et al.*, 1959). It is the ability of one supply chain member to provide or withhold rewards in promoting desired behaviours. Non-coercive power therefore involves rewards and assistances and increases the value of relationship through team support, common interests and supporting collective goals (Jonsson and Zineldin, 2003; Ireland and Webb, 2007). Non-coercive power has been hypothesised to provide numerous relational advantages including the ability to overcome lack of consensus (Odongo *et al.*, 2017), promoting innovation and change and providing stability and legitimacy to the supply chain (Cox, 2001; Ireland and Webb, 2007).

Previous studies have postulated that non-coercive power has a positive effect on SCP (Zhao *et al.*, 2008; Nyaga *et al.*, 2013).

Hence, we hypothesize that:

H2a: *The perceived use of non-coercive power will positively influence efficiency;*

H2b: *The perceived use of non-coercive power will positively influence quality;*

H2c: *The perceived use of non-coercive power will positively influence responsiveness; and*

H2d: *The perceived use of non-coercive power will positively influence chain balance.*

4.2.3 Control variables

In testing the conceptual model (Figure 11), we controlled for supply chain position (being a focal firm) and firm size. Controlling for these two variables was motivated by the fact that both firm size and being a focal firm are potential sources of market power in the maize supply chain. As observed in chapter 1 and 2, larger firms could have a performance advantage over smaller firms due to better access to capital, better bargaining power, and market information and economies of scale (Cavusgil and Nevin, 1981; Christensen *et al.*, 1987; Ambler *et al.*, 1999). Previous authors such as Nyaga *et al.* (2013) and (Fynes *et al.*, 2008) have acknowledged the potential role of firm size and supply chain position as sources of market power, and hence the need to control for them when analysing power relations in supply chains. Therefore, controlling for firm size and supply chain position would reduce their confounding effects on the observed variable (supply chain performance). It therefore means that, when looking at the perceived influence of power on SCP, the potential confounding effects of firm size and focal firm are held constant. This therefore rules out alternative explanations for the observed relationships. Additionally, it also reduces potential errors associated with measurements (Colvin *et al.*, 2001; Becker, 2005).

The above hypothesised relationships are depicted in figure 11 below.

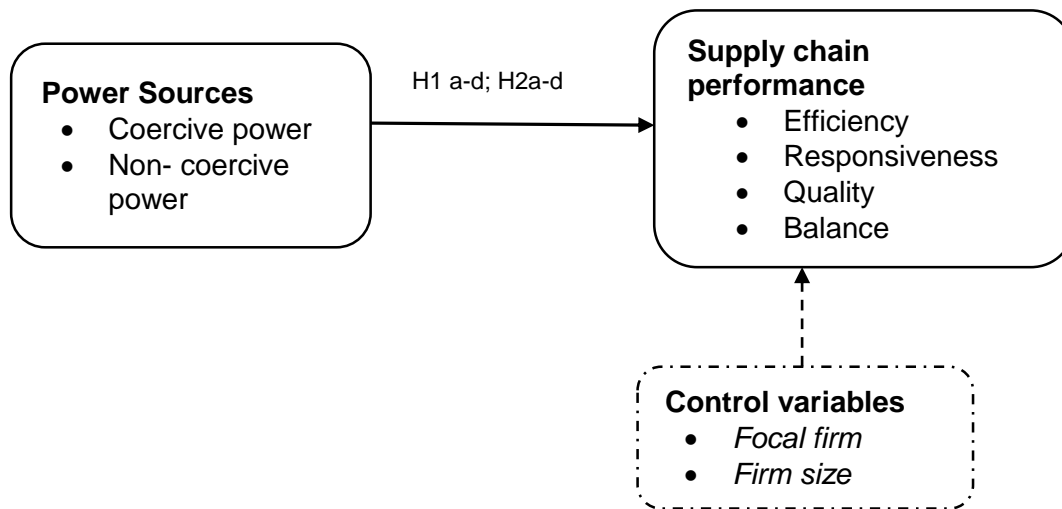


Figure 11: Conceptual framework

4.3 Methodology

The study context, approaches to sampling and data collection, sampling and sample characteristics, and measurement properties are described in chapter 1, under sections 1.2, 1.7.1, 1.7.2 and 1.7.3. For purposes of this chapter, we only present the data analysis procedures which are peculiar to this chapter.

Being a focal firm and firm size was used as control variables in this chapter. Focal firm was measured as a dummy variable. i.e., a dummy variable was created where a focal firm was given a score of 1 and the customer and supplier firms were given a score of 0. Firm size was measured by the number of formal employees that a firm employed at the time of the interview. The choice of the number of employees as a measure of firm size was guided by the fact that it was the only construct which we could get the most accurate response from the respondents, compared to other indicators like turn over. Because of this, it has also been used in previous studies as the most objective indicator of firm size (d'Amboise and Muldowney, 1988; Park and Krishnan, 2001; Fynes *et al.*, 2008; UBOS, 2014).

4.3.1 Analysis

As observed in chapter 2, the constructs for this study were being used in the Ugandan context for the first time. Consequently, we conducted an exploratory factor analysis (EFA) to assess the uni-dimensionality of the scales (Narasimhan and Jayaram, 1998; Zhao *et al.*, 2008). The EFA with principal component analysis (PCA) was done without specifying the number of factors. Varimax rotation with Kaiser Normalization was used to clarify on the number of factors. Cronbach alpha was then calculated for each factor extracted to assess the internal consistency of the extracted components (Janssens *et al.*, 2008). For SCP, four factors with Eigen values greater than one were extracted, explaining 60% of the variations in SCP. The four factors generally maintained the original dimensions in which SCP was measured. For power, two factors explaining 87.0% variations in power were extracted. The two factors maintained the original dimensions of coercive and non-coercive power as they were measured. Summary of the constructs used, their factor loadings, Eigen values and reliability values are presented in Table 10.

Table 9: Exploratory factor analysis results

Construct	Factor loading	Eigenvalues	Cronbach's alpha
<i>Efficiency</i>		1.77	0.60
EFF1	0.80		
EFF2	0.53		
EFF3	0.75		
<i>Responsiveness</i>		1.43	0.45
RES1	0.69		
RES3	0.83		
<i>Quality</i>		1.37	0.50
QUA1	0.76		
QUA2	0.77		
<i>Chain balance</i>		1.19	0.25
BAL1	0.77		
BAL2	0.70		
Non-coercive Power		1.839	0.674
NCP1	0.87		
NCP2	0.85		
Coercive Power		1.513	0.914
CP1	0.95		
CP2	0.96		

Structural equation modelling

The second stage of analysis involved estimating standardized path estimates to assess the hypothesized relationships amongst the constructs using structural equations modelling

(SEM). Following Anderson and Gerbing (1988), we used the two-step approach of testing measurement and structural models. Basing on the EFA, a measurement model was built for the two power and four SCP constructs (Table 10). We also included the two control variables of focal firm and firm size in the measurement model (Figure 12). The measurement model was adjusted through removing items with low loadings (<0.5; CR<1.9) on the respective latent variables in an iterative process. In the process, chain balance was dropped out of the model because the loading of observed variables on the latent variable were both below the 0.5 threshold (Hair *et al.*, 2006; Janssens *et al.*, 2008). This was done so as to achieve convergent validity in the measurement model (Hu and Bentler, 1999; Janssens *et al.*, 2008). The decision to drop chain balance out of the model was also supported by the fact that the construct also had a low Cronbach alpha value (0.24), suggesting poor internal consistency amongst the observed variables (Table 10). The final measurement model (Figure 12) had fit indices of $\chi^2=67.540$, $\chi^2/df=1.93$ p -value=0.001, GFI=0.95, CFI=0.94, IFI=0.94, RMSEA=0.07; which are all within acceptable limits for a confirmatory factor analysis (Hu and Bentler, 1999; Janssens *et al.*, 2008).

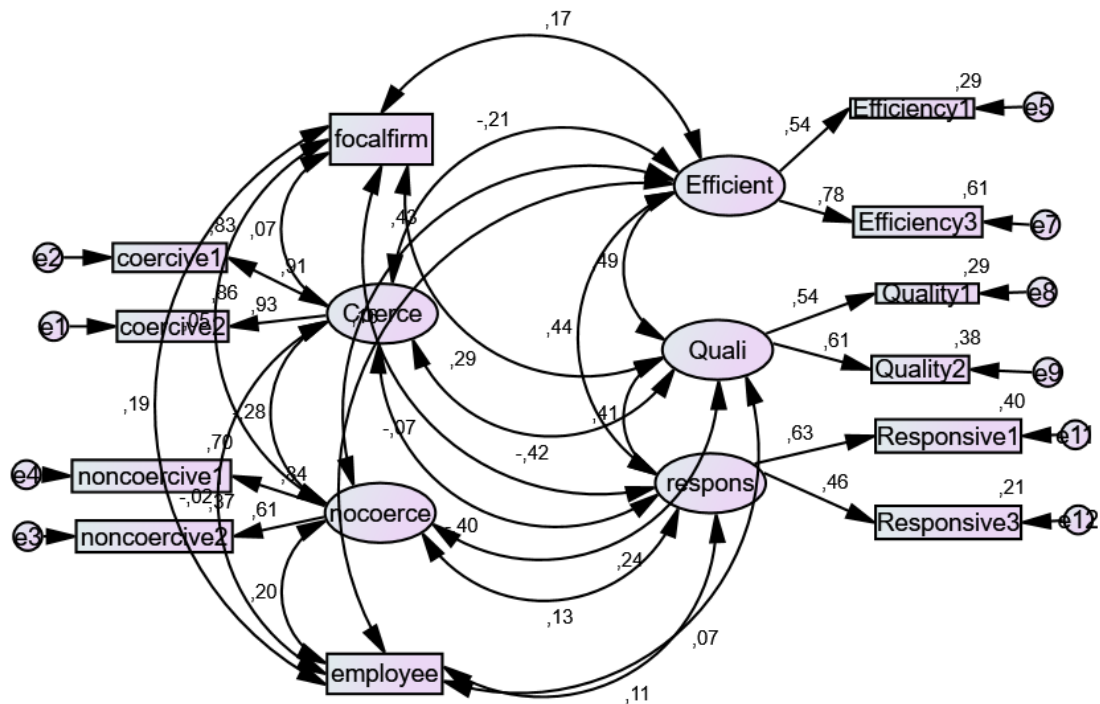


Figure 12: Measurement model for SEM

A structural model based on the measurement model was then estimated using the maximum likelihood method. The structural model was modified through co-varying the error terms on efficiency with quality, and quality with responsiveness. The modifications resulted in a model with fit indices of $\chi^2=69.439$ p -value=0.001, GFI=0.948, CFI=0.934, TLI= 0.879; IFI=0.938; RMSEA=0.068), which are within acceptable limits for SEM (Hu and Bentler, 1999).

4.4 Results

Results show that coercive power was perceived to negatively influence quality and responsiveness; hence providing support for hypothesis H_{1b}, H_{1c}. We also found that non-coercive power was perceived to positively influence efficiency, providing support for hypothesis H_{2a}. Additionally, being a focal firm was positively associated with quality (Figure 13). We however, did not find any significant association between firm size and SCP.

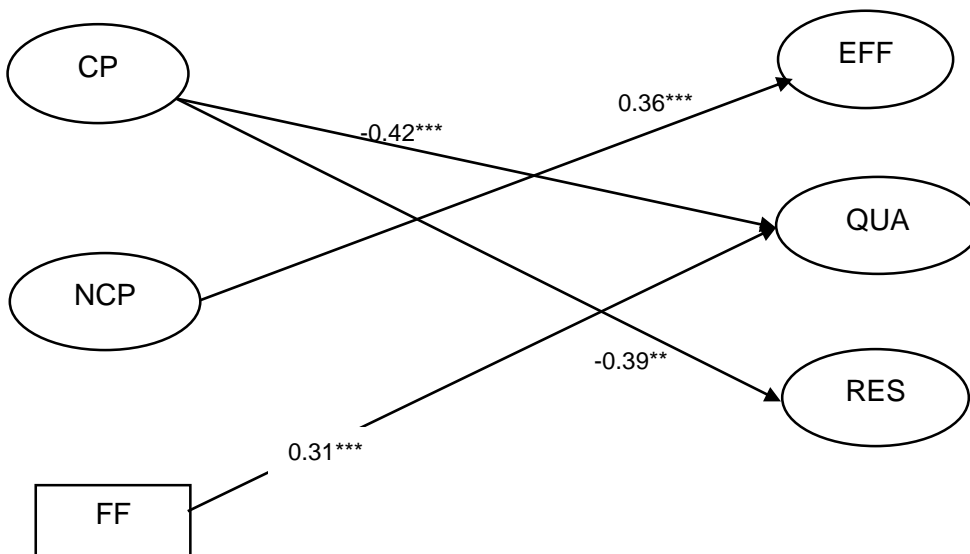


Figure 13: Significant paths for the structural model
 , *, P -value significant at 5% and 1% respectively

Multi-group SEM analysis revealed that there were differences in the perceptions of power use and its influence on SCP amongst supply chain members (Table 11). On the upstream, suppliers perceived the use of coercive power by the focal firms to significantly and negatively

influence efficiency, quality and responsiveness. Suppliers also perceived the use of non-coercive power by the focal firms to positively and significantly influence efficiency and responsiveness. This perception of the suppliers was however not shared by the focal firms, who perceived that only the use of coercive power by their suppliers significantly and negatively influenced quality. On the downstream, focal firms did not consider the use of coercive power by the customers to significantly influence performance. Customers on the other hand perceived the use of coercive power by the focal firms to negatively and significantly influence responsiveness.

Table 10: Standardized path estimation for sub-group specific estimates

<i>Paths and perspectives</i>			<i>Standardised Estimates</i>			
			<i>S-F</i>	<i>F-S</i>	<i>F-C</i>	<i>C-F</i>
Coercive power	→	Efficiency	-0.45***	0.10	0.33	-0.20
Coercive power	→	Quality	-0.78*	-0.53*	-0.14	-0.20
Coercive power	→	Responsiveness	-1.50*	-0.11	-0.36	-0.56***
Non-coercive power	→	Efficiency	0.56***	0.55	0.50	0.06
Non-coercive power	→	Quality	0.25	-0.00	0.12	-0.13
Non-coercive power	→	Responsiveness	-1.96*	0.703	0.15	-0.13

Note: *, **, *** indicates significance at 0.05, 0.01 and 0.00 respectively

Concluding, while our pooled sample results provided partial support for the hypothesised relationships (H_{1b} , H_{1c} , and H_{2c}), multi-group analysis, revealed differences in the perception of power and its use amongst supply chain members. Generally, these findings give credence to the influence of power in supply chain performance, and to the proposition that the perception of power and its use varies amongst supply chain members.

4.5 Discussions

Although most researchers believe that empirical studies on SCP should collect and analyse data from at least three firms in a supply chain (Mentzer *et al.*, 2001; Choi and Wu, 2009a; Wu *et al.*, 2010), only a few have attempted to do this empirically. Using a triad as a unit of theory and analysis, this chapter provide insights into power use and perception amongst supply chain

members. Generally, the results regarding power influences are in agreement with previous studies on power relations in supply chains. Previous authors such as Sanfiel-Fumero *et al.* (2012); Nyaga *et al.* (2013); Kühne *et al.* (2013); and Zhao *et al.* (2008) have indicated that the use of coercive power have negative influence on performance, while the use of non-coercive power have positive influence on performance. The positive effect of supply chain position (focal firm) suggests that being a focal firm is a source of power in the supply chain. This results underline the privileged position that the focal firms occupy in the maize supply chain relative to suppliers and customers. Because of their position and size, focal firms have better access to resources and information, which are sources of power in business transactions.

These findings generally, underscores the nature of business operations in the maize supply chain in Uganda which is characterised by lack of institutional framework to guide business operations (Rashid, 2002; Larson and Mbowe, 2004; Fafchamps and Hill, 2005; Maestrini *et al.*, 2017). Consequently, business relationships are mostly non-contractual and based on trust relationships. In such situations, exercise of coercive power will only serve to discourage supply chain members from continuing in a business relationship (Pulles *et al.*, 2014). In practice, if one member perceives that another member is being coercive, it is most likely to retaliate by declining to make specific required adjustments or collaborate in joint relationship activities. For instance, if the focal firm compels a supplier to adhere to certain quality standards, the supplier may act opportunistically by changing from one buyer to another. In these situations, the buyer (focal firm) will stand to lose the consignment, hence decrease in performance. The exception might be in situations when a supplier has made asset-specific investments, such as in the maize seed production. In this situation, the supplier has limited opportunities to sell to other buyers at a better price, and has to abide by the agreed terms and conditions. In the absence of formal contracts therefore, supply chain members might be forced to use threats, such as loss of contracts, to have partners adhere to desired performance standards such as delivery time and quality standards (Pulles *et al.*, 2014).

When formal contracts fail to work, supply chain members may need to use more relational approach in managing their supply relationships (Williamson, 1979). These arguments, based on the TCE, could explain the positive influence of non-coercive power on SCP. Non-coercive power has a number of relational advantages, including the ability to overcome a lack of consensus amongst supply chain members (Cox, 2001; Ireland and Webb, 2007). Previous authors such as Sheu (2015) and Kühne *et al.* (2013) also give credence to the positive influence of non-coercive power on SCP. Therefore, providing incentives, such as rewards and bonuses to supply chain partners will make them feel appreciated and can result in a positive view of the relationship. For agribusiness managers, understanding of their power relative positions in the supply chain would enable them to use their power appropriately to serve the best interest of their firms as well as the supply chain. Understanding of the relative power position can therefore be considered as a first step towards achieving a competitive advantage for the supply chain (Huo *et al.*, 2017).

The multi-group analysis revealed that there were differences in perception of power and its influence on performance amongst supply chain members. For instance, suppliers, perceived the exercise of coercive power by the focal firms to negatively influence efficiency, quality and responsiveness. Although, these views were not entirely shared by the focal firms, it indicates who has more power in the upstream of the supply chain. Getting back to the RDT, the more powerful firm can activate its power to serve its own interest, to the detriment of the other firms (Granovetter, 1985). This is most likely the situation here, as focal firms, with access to information and resources, coerce suppliers to do what they (focal firms) want. This argument is supported by the finding that being a focal firm significantly influences quality. This therefore underpins the power position of focal firms in the supply chain. Due to the lack of adequate institutional mechanisms (Fafchamps and Hill, 2005; Maestrini *et al.*, 2017), focal firms take it upon themselves to monitor the behaviours of their suppliers and ensure conformity to standards and quality.

Another interesting observation is the fact that the focal firm was perceived to exert more power (both coercive and non-coercive) on the upstream, than on the downstream. This result highlights the difference in the nature of business operations between the upstream and downstream of the maize supply chain. On the upstream, business operations are generally informal, and characterised by many small traders operating on cash-based and spot market arrangements (Daly *et al.*, 2016). This creates a lot of uncertainties, which may lead to opportunistic behaviours amongst supply chain members. In such situations, the focal firms may take advantage of their power positions to ensure that suppliers conform to their expectations, hence the use of coercive and/or non-coercive power.

On the contrary, business operations in the downstream, are generally formal (IDEA, 2003), with processors and manufacturers dealing with super markets, institutions and export companies. Hence, business transactions are usually formalised through contractual arrangements between trading partners. This could explain the general lack of significant differences in perception of power between the focal firm and the customer. Because business transactions are based on formal contracts that can be monitored, downstream supply chain members may not be tempted to behave opportunistically to be successful. In any case, opportunistic behaviours will attract sanctions such as loss of contracts and reputation that supply chain members would not be willing to face.

The observed downstream and upstream perceptual differences could also indicate what performance parameters are important in the two segments of the supply chain. On the upstream, we observe that efficiency, responsiveness and quality are all important. While on the downstream, it is responsiveness that is critical. Looking at the study context, the downstream of the maize supply chain in Uganda requires fast and timely product delivery. As such, responsiveness is critical especially for the customer firms who deal with final consumer products, most of who require that products are delivered on schedule. On the upstream, quality, efficiency and responsiveness were critical. Quality standards enforcement for

instance is generally poor in the maize supply chain, creating a lot of uncertainties amongst supply chain members (FEWSNET, 2017). Due to the chances of suppliers acting opportunistically by for instance adding foreign materials in a bag of maize, focal firms have to evoke their power to avoid this behaviour.

4.6. Conclusions and implications

Power relations are at the heart of business to business relationships, and a key question always asked is “who has the power and who benefits from it?” This chapter examined power relations, and the perception of power use in a triadic agribusiness supply chain context. We found that the presence of power and/or its perceived existence influences supply chain performance. However, the direction of the influence varies depending on the type of power used, supply chain position, and the nature of business relationship that exist amongst supply chain members. We also find evidence of the existence of power asymmetry in the supply chain with focal firms perceived to be more powerful than their suppliers and customers. The fact that supply chain members differed in their perception of their partners’ power, power use and the influence of power on performance underpin the social construction of power in supply chain relationships.

Since coercive and non-coercive power was perceived to have contrasting effects on SCP, it is important that both the power source and power target recognize the presence of power and reconcile their supply chain strategy to take into account power influences. For managers, this implies that being open about their power positions with supply members can help to improve on the performance of each member as well as the performance of the whole supply. Managers also needs to be aware of their power positions to be able to use appropriate power influences based on their positions in a supply chain. It is also essential for supply chain members to understand how their business partners perceive their power positions and use in the supply chain. This will enable the focal firms to know when and how to evoke which source of power (Lacoste and Blois, 2015). This will help to avoid high levels of power asymmetry which may

lead to more adversarial relationships, as the powerful partner tend to be more assertive in the business relationship (Tretyak and Radaev, 2013). Additionally, a lack of understanding of relative power positions of chain member may lead to building and using wrong strategies towards its business partners, an approach which can be detrimental to both parties. Understanding the current power position of a firm is also a critical step towards achieving a competitive advantage in the supply chain.

Thirdly, depending on how it is used, power may have positive or negative influences on supply chain performance. The use of rewards and incentives is a strong gesture from a member that s/he values that relationship, and strengthens the relationship. Hence, supply chain members may need to consider providing incentives, such as awards, bonuses or performance incentives to their partners. Using incentives make partners feel appreciated and can result into a positive view of the relationship. Finally, in situations where there is lack of institutional framework to guide business operations, the use of relational governance approaches will go a long way in improving supply chain performance.

4.7 Limitations and future research

Some limitations of this study are worth mentioning. Firstly, the study only focused on one commodity chain in one country, which can limit the applicability of our findings. Future studies could assess power perceptions across different commodity chains and countries to understand if there are differences in perceptions. The second limitation arises from the use of the matched triad approach of data collection. While ideal for studying a triad, this approach is difficult to operationalize in the field especially where there is no established database for SMEs. Future studies could replicate similar methodologies where businesses are more formalized.

Chapter 5

General Conclusions

5.0 General conclusions

The overall objective of this PhD dissertation was to understand the perception of supply chain relationship quality and how it influences supply chain performance and satisfaction. These relationships were tested in an agribusiness (maize) supply chain in a developing country context (Uganda). The dissertation revolved around finding answers to three interlinked research questions, that were developed in line with the existing empirical and conceptual gaps in the SCM literature (Figure 1). These research questions were addressed in the four research chapters 2, 3, and 4. In this chapter, we revisit each of these research questions, draw major conclusions from the findings, highlight the contributions of this dissertation to SCM literature and practice; discuss key managerial contributions, and outline the key limitations and directions for future research that arises from the study.

5.1 Research questions revisited and answered

5.1.1 Does good relationship quality lead to improved supply chain performance?

Successful supply chain management (SCM) requires that strategic relationships with critical supply chain partners must be understood so as to maximise the value creation process in the relationship (Chen and Paulraj, 2004b). This is because contemporary SCM literature suggests that the basis of competition has shifted from competition between firms to competition between supply chains (Molnár *et al.*, 2010; Wu *et al.*, 2010; Kühne *et al.*, 2013; Wynstra *et al.*, 2015). Although most previous SCM studies show that a good supply chain RQ is a crucial precursor to a stable supply chain relationship and leads to improved SCP, most of these studies assessed supply chain relationships using focal firm approach in dyadic b2b or b2c settings (Terpend *et al.*, 2008; Nyaga *et al.*, 2013). While good for highlighting the perceived outcomes of supply chains relationships, this approach has an inherent possibility of inflated empirical relationship which limits the generalizability of these findings to the entire supply chain (Rungtusanatham *et al.*, 2003a). As such focusing on a dyad as a unit of theory and analysis has been criticised for not being able to bring out the underlying dimensions of the entire supply chain relationships (Wu *et al.*, 2010; Kühne *et al.*, 2013). These shortcomings of

using a dyadic approach have raised interests in measuring supply chain level relationships and its outcomes. Assessing supply chain level relationships helps to gauge supply chain members' contribution; rationalize the continuation of participation by supply chain members and; and assess the basis for sharing supply chain benefits.

This research question was addressed in chapter 2, using data collected from a triadic agribusiness supply chain, composed a supplier, focal firm, and customer. Our findings are in consonant with previous SCM studies such as Kühne *et al.* (2013), Molnár *et al.* (2010), Schiefer *et al.* (2009a), that a good supply chain relationship positively influences SCP. This suggests that supply chain members would benefit from establishing and maintaining a good supply chain relationship with their partners. The fact that downstream and upstream relationship quality perceptions differed gives credence to the use of triad as a unit of theory and analysis in SCM studies. Therefore, while previous studies identified empirical support for the positive association between RQ and SCP in dyadic frameworks, we provide empirical evidence of the positive association between RQ on SCP from a triadic agribusiness supply chain context in a developing country context.

5.1.2 Does improved supply chain performance lead to higher satisfaction?

Satisfaction has been postulated to play an important role in the development of competitive strategies, influencing customer purchase intentions and loyalty, that eventually leads to improved SCP (Boniface *et al.*, 2012). As a behavioural outcome, satisfaction is intricately linked to SCP (Robicheaux and Elansary, 1977). When supply chain members are satisfied, they have high moral and incentives for participating in collective supply chain activities (Geyskens *et al.*, 1999). According to Robicheaux and Elansary (1977), satisfaction encourages performance, which in turn encourage satisfaction. However, empirical studies on the relationship between SCP and satisfaction are few and far in between (Geyskens *et al.*, 1999; Benton and Maloni, 2005). As such, the nature of relationship between SCP and satisfaction is not well understood.

The relationship between SCP and satisfaction was the subject of investigation in chapter 3. We assessed how the perception of SCP influences satisfaction of supply chain members, as well as the potential moderating roles of relationship duration and firm size. While we find that SCP was positively associated with economic satisfaction, the link between SCP and social satisfaction was negative and not significant. The positive association between SCP and economic satisfaction finds support from previous authors such as Boniface *et al.* (2012), Stank *et al.* (1999), and Robicheaux and Elansary (1977) who found that operational performance positively influence economic satisfaction.

On the other hand, the negative association between SCP and social satisfaction points to the fact that while supply chain members may be economically satisfied with their SCP, they may not be socially satisfied with it at the same time. This therefore gives justification for making a distinction between economic satisfaction and social satisfaction while analysing supply chain relationships and their outcomes. The observation that relationship duration and firm size does not moderate the relationship between SCP and satisfaction provides justification for understanding contextual differences and how it can influence supply chain management mechanism. While previous SCM studies in manufacturing and service sectors suggest that relationship duration and firm size moderates the association between SCP and satisfaction, our study could not find evidence of such moderation effects. We believe that the spot market arrangements that characterise the maize supply chain in Uganda could justify this observation. Hence, an understanding of the specific context of the supply will facilitate a successful establishment of supply chain relationship.

5.1.3 How do power relations influence supply chain performance?

Supply chain relationships presumes an asymmetric distribution of power amongst supply chain members (Nyaga *et al.*, 2013; Reimann and Ketchen, 2017). Power asymmetry in supply chain may arise due to variations in cost structure, size of the organization, capability and nature of contracts (Belaya *et al.*, 2009; He *et al.*, 2013; Cuevas *et al.*, 2015; Lacoste and Blois,

2015; Rindt and Mouzas, 2015). Additionally, power relations in supply chains keeps evolving as firms become more complex and multifaceted. Therefore, it is important to understand how supply chain members perceive power relations and its use (Odongo *et al.*, 2017). Understanding the perceptions and power can give an understanding of how supply chain members gain power and use it to gain control, share profits, and ultimately how it influences SCP (Nyaga *et al.*, 2013; Rindt and Mouzas, 2015).

Understanding the perceptions of power relations is even more important in the context of agribusiness SMEs, where power disparity can affect firms collaborative behaviours, either due to opportunism or due to stronger members taking advantage of their power positions to appropriate greater value of the relationship (Hingley, 2005; Nyaga *et al.*, 2013; Lackes *et al.*, 2015). Currently, there are few studies that have focused on the influence of power on SCP in the context of agribusiness SMEs (Adams *et al.*, 2012; Sukwadi *et al.*, 2013). As such there is a need for more studies to understand the nature and effects of power in supply chain in order to provide balanced benefit distributions for all supply chains members (Nyaga *et al.*, 2013).

Chapter 4 examined power relations and the perception of power use in a triadic agribusiness supply chain context. We found that coercive power was perceived to negatively influence SCP, while non-coercive power was perceived to positively influence SCP. These findings are in agreement with previous authors such as Zhao *et al.* (2008), Terpend and Ashenbaum (2012), Sakano and Johnson (1993), Nyaga *et al.* (2013), and Brown *et al.* (1996), who observed that coercive and non-coercive power have negative and positive influences on SCP respectively. What we draw from these results is that the presence of power and/or the knowledge of its existence influence SCP. However, the direction of the influence varies depending on the type of power used, supply chain position, and the nature of business relationship that exist amongst supply chain members. This is based on the observation that the perception of power varied between the upstream and downstream of the supply chain.

5.2 Main conclusion

This PhD dissertation was designed to assess and understand how the RQ's influence SCP and satisfaction in a triadic supply chain context; and to understand whether these perceptions are shared amongst supply chain members. The study was conducted in the context of agribusiness SMEs in a developing Country, namely Uganda. A triadic approach to data collection and analysis was employed in this study. The use of a triadic approach facilitated the assessment of perceptual differences amongst supply chain members in the downstream and upstream segments of the supply chain. The major findings with respect to the key questions are presented in section 5.1. In this section, we highlight the key findings with regards to research gaps that were identified under section 1. 3.

The major motivation behind this PhD research undertaking was the fact that despite the general consensus in SCM literature that the perceptions of all supply chain members should be studied in order to gain insight into their relationship dynamics (Ambrose *et al.*, 2010; Molnár *et al.*, 2010; Oosterhuis *et al.*, 2013; Odongo *et al.*, 2016); the common approach has been to focus on the dyad as a unit of theory and analysis (Klein and Kozlowski, 2000; Oosterhuis *et al.*, 2013). Consequently, researchers have used both single respondent and dyadic samples in order to understand differences in perception of relationship between supply chain members. Moreover, the differences in perceptions have mainly been tested on separate groups of buyers and suppliers, and rarely between buyers and suppliers from the same supply chain relationship (Terpend *et al.*, 2008; Whipple *et al.*, 2010).

By using a triad as a unit of theory and analysis, this dissertation therefore advances the empirical understanding of supply chain relationships beyond the predominant dyadic conceptualisation and analysis. The shift in analysis from dyad to triad, especially the assessment of the downstream and upstream perceptual differences adds a new dimension to the analysis of supply chain relationships and their outcomes. In each of the three research chapters, we found evidence of perceptual differences amongst supply chain members. The

lack of symmetry between the downstream and the upstream proves the relevance of using a triad as a unit of theory and analysis in SCM research. Consequently, this gives credence to the use of the triadic approach especially in agribusiness supply chains with similar characteristics as the one investigated in this study. These results therefore contribute to the ongoing debate in the SCM literature that a firm or a dyad is heavily influenced by the supply chain network in which it operates, hence the need to look at the triad as a unit of theory and analysis.

The observed differences in perception amongst supply chain members also highlight the importance of understanding contextual differences as a basis for SCM decisions. For instance, we observed that formal markets segments were managed based on contracts and trust, while informal markets segments were managed based on power-dependency and trust relationships. Additionally, while efficiency was highly valued in the formal segments, chain balance (understanding) was highly valued in the informal segments. These findings show how a supply chain links its formal and informal segments to ensure success of the entire supply chain. Additionally, it also highlights the pivotal role of the focal firm in linking the formal and informal markets segments, through switching the management approaches/mechanisms depending on the nature of the supply chain partner, and supply chain segment in question. While SCM mechanisms such as trust and contracts have been shown to operate in purely formal and/or informal supply chain contexts, the uniqueness of the maize supply chain (characterised by the existence of both formal and informal segments) points to the fact that the use of these management mechanism will vary depending on the nature of supply chain.

These variations in the success factors for supply chain relationships management also gives credence to the need to study and understand supply chain relationships in different contexts. While we show that building long-term strategic supply chain relationships can be mutually beneficial to supply chain members, we also argue that supply chain members should strive to understand each other's perceptions, interests and expectations in order to be successful.

Consequently, agribusiness SMEs managers, should strive for tailor-made efforts to enhance specific relationship aspects with respect to their individual suppliers and customers. This is because business relationships vary depending on the characteristics of the market and the partner in question, and consequently what works with one partner may not necessarily work with another.

5.3 Contributions

The motivation for conducting this PhD research was to contribute to the knowledge base in the SCM discipline, and to aid the application of that knowledge in professional SCM research and practice. In this section, we revisit the intended conceptual, methodological and empirical contributions as stipulated in sub-section 1.7, and discuss the level of their realisation in line with the results obtained.

This PhD dissertation makes an empirical contribution by investigating supply chain relationships and their outcomes in a developing country context (replication). Further empirical contribution of this dissertation lies in the choice of the sector, the agribusiness sector in developing countries received little past attention in SCM literature. However, its particularities, as discussed in sub-section 1.2, make it an interesting case to study supply chain relationships (extension). Consequently, this research has significant managerial implications for the agribusiness sector, which is dominated by SMEs in developing countries such as Uganda.

Conceptually, this dissertation contributes to the ongoing debate in SCM literature that a firm or a dyad is heavily influenced by the supply in which it operates, as such a supply chain should be conceptualised and analysed as a triad at the very least. Further conceptual contribution lies in the application of the triad as a unit of theory an analysis. The triadic conceptualisation employed in this dissertation goes beyond the predominant dyad approach in SCM. This

dissertation therefore gives empirical evidence and support for using a triad as a unit of theory and analysis.

Theoretically, this dissertation advances the application of TCE, the structural-hole concept, and the balance theory and the RDT in understanding the nature of business relationships and their outcomes, especially in the context of three-tier triadic chains. The observation that the focal firm plays a pivotal role in linking the informal upstream and the formal downstream of the supply chain, gives credence to the use of the structural-hole concept in analysing triadic supply chain relationships. Through switching between relational and contractual mechanisms in managing upstream and downstream relationships, the focal firm creates balance in the supply chain (balance theory). In the process of filling the structural-hole and creating balance in the supply chain, the focal firm utilises its power position as a resource in ensuring that supply chain relationships succeeds (RDT). Additionally, by switching management mechanisms between the upstream and downstream, the focal firm ensures that the least-cost management option is adopted, as stipulated in TCE.

Methodologically, this dissertation made use of generally accepted methods and practices (replication) in SCM to answer the research questions that was put forward. Additionally, this dissertation incorporates novel approaches (innovation) such triadic analysis, SEM, and MSEM, which are innovative in the agribusiness SMEs sector and extension of the use of this approaches in SCM literature. The shift in analysis from a dyad to a triad, as well as the analysis of perceptual differences between the upstream and downstream, further add a new dimension to SCM literature. By adapting and using a triadic approach in the agribusiness SMEs settings, this study innovatively builds on the application of the triad and provides justification for its use in understanding business relationships and their outcomes.

5.4 Practical implications

The results of this dissertation have implication for agribusiness SMEs managers, as well as social implications with regards to the maize supply chain. For agribusiness SMEs managers, these results suggest that their businesses would benefit from building good supply chain relationships with their supply chain partners. However, for these relationships to be mutually beneficial and successful, it is important that managers get a good understanding of their business partners in terms of characteristics, interests and goals. An understanding of supply chain partners would enable managers design tailor-made efforts to enhance specific relationship aspects with respect to their individual suppliers and customers. The rationale is that business relationships are context specific, and as such, what works with one partner may not necessarily work with another.

Socially, the maize supply chain provides a source of livelihood to over 4 million people, most of whom are smallholder farmers and small-scale traders in Uganda. The sector is developing rapidly and has huge growth potentials in terms of local, regional and international trade. As such, improving the informal supply chains business transactions is likely to have strong pro-poor outcomes because of the maize sector potentials. This because, improvements in business transactions will results into improved performances and hence incomes of the farmers and traders involved in the maize supply chain. This will ultimately translate into improved livelihoods and economic development for Uganda.

5.5 Limitations and directions for future research

Like all research undertakings, this dissertation was based on a specific research context, design, methodology and analysis techniques. While making these choices was necessary for the feasibility of the research undertaking, they also pose some limitations that deserve to be acknowledged. Highlighting these limitations also provide opportunities for future research undertakings.

The first limitation arises from the use of the matched triad approach to data collection and analysis. While unique and fitting for this study design, using the matched triad approach to presented a challenge during data collection. This is because many focal firms were not willing to give information concerning their important suppliers and customers. This consequently this limited the number of supply chains that could be identified and studied. Previous studies that have used similar approaches such as Molnár *et al.* (2010), Kühne *et al.* (2013), and Wu *et al.* (2010) have also highlighted the difficulties in achieving representativeness using the matched triad approach. Because of these underlying sampling difficulties, our study sample was not selected to represent the underlying maize supply chain population. As such, generalization of the findings to the entire agribusiness SMEs population should be done cautiously. These results however, provide interesting insights and deserve further considerations in similar contexts using a larger sample size. Future studies could therefore replicate similar methodologies in different commodity chains and country context. Such studies would not only concretise the use of triadic approach to data collection and analysis, but also further justify its use in the analysis of agribusiness supply chain relationships.

The second limitation arise from the fact that, this study was a cross-sectional design based on one commodity chain and in as single country. The findings from this study can therefore be taken as an indicator of the perceived influence of RQ on SCP and satisfaction in a developing country context. Future studies could confirm these results using datasets covering more than one agribusiness supply chain, and in more than one country. Such studies could compare differences in RQ perceptions amongst different supply chains and countries. Additionally, future research could focus on longitudinal assessment of two or more commodity supply chains in different countries. Such studies would give more insights into whether supply chain members perceptions varies according to the commodity and/or country.

Fourthly, while we found evidence of how transaction characteristics influence supply chain management mechanisms, this study did not investigate how the different transaction

typologies such as contracts, spot markets could influence supply chain performance and satisfaction along the supply chain. Looking into the different transaction typologies could provide some insights into whether the nature of relationships amongst supply chain members varies depending on the nature of transaction between/amongst supply chain members. Future studies could investigate how different transaction typologies influence supply chain relationships and as well as SCP and satisfaction.

The last limitation is concerned with the chain level analysis. While we collected triadic data, our triadic supply chain analysis was limited to the assessment of perceptual differences amongst supply chain members, as well as between the upstream and downstream. Consequently, we were not able to compare different supply chains and understand if particular chains performed better than others, and what success factors are responsible for those performance differences. Future studies could therefore expound on this aspect as assess difference between supply chains and their success and/or failure factors.

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Samenvatting

Maïs is een belangrijk graangewas voor de Oegandese economie in termen van handel en inkomen. De economische mogelijkheden en het belang van maïs zijn grotendeels te danken aan het feit dat Oeganda een concurrentievoordeel heeft bij de productie van maïs. Dit komt door de relatief lage productiekosten voor maïs, het vermogen om tweemaal per jaar te produceren en de grotere vraag naar maïs in buurlanden en regio's. Door deze strategische voordelen kunnen verbeteringen in maïs marktsystemen het potentieel hebben om het inkomen van huishoudens te verhogen en bijgevolg bij te dragen tot armoedebestrijding voor de overheersend kleine boerderijen. Dit potentieel wordt echter belemmerd door de gebrekkige infrastructuur (fysieke en marketing), informatie-asymmetrie en toegangsbarrières als gevolg van het inefficiënte functioneren van aanverwante instellingen zoals krediet- en transportsystemen die momenteel de aanvoerketen van maïs in Oeganda kenmerken. Daarnaast hebben recente transformaties in de agro-food sector geleid tot meer concurrerende supply chains. Om te slagen in deze concurrerende marktomgeving, moeten de supply chain leden hun samenwerking met partners vergroten/ verbeteren door langdurige relaties op te zetten en te onderhouden.

Als zodanig is er behoefte aan een systematisch inzicht in de omstandigheden waaronder zakelijke relaties een duurzaam concurrentievoordeel voor supply chain leden kunnen of niet kunnen waarborgen, alsmede hoe de operationele prestaties van een onderneming kunnen profiteren van de banden met leveranciers en klanten. Dit doctoraat streefde naar het beoordelen van de percepties van de kwaliteit van de supply chain relaties en de invloed ervan op de prestatie en tevredenheid binnen de keten. Het proefschrift draait om drie onderling verbonden onderzoekshoofdstukken die zijn opgericht op basis van geïdentificeerde onderzoekshiaten uit de management literatuur rond supply chains. In het eerste onderzoekshoofdstuk werd de verwachte invloed van de relatiekwaliteit op de prestatie van de supply chain beoordeeld; In het tweede hoofdstuk werd de potentieel modererende rol van relatiekenmerken geanalyseerd over de relatie tussen de prestaties van de supply chain

enerzijds en de tevredenheid anderzijds. Het derde hoofdstuk onderzocht de waargenomen invloed van macht op de prestatie van de supply chain. Onze conceptualisering omvat het gebruik van een triade als een eenheid van theorie en analyse. We gebruiken primaire gegevens verzameld onder 150 mais supply chain leden (bestaande uit 50 triadische ketens, d.w.z. 50 leveranciers, 50 focusbedrijven en 50 klanten). In de analyse werd een combinatie van beschrijvende statistieken (percentages, frequenties) en structurele vergelijkingsmodellering gebruikt.

Resultaten tonen aan dat goede relatiekwaliteit werd waargenomen om de Supply Chain Performantie (SCP) positief te beïnvloeden. Hoewel verbeterde supply chain performantie met economische tevredenheid was verbonden, was de relatie tussen supply chain performantie en sociale tevredenheid niet significant. Verder bleek dat de relatieduur en de grootte van het bedrijf de relatie tussen SCP en tevredenheid niet gematigd hebben. Op machtsrelaties werd dwangvermogen beschouwd om SCP negatief te beïnvloeden terwijl niet-dwangvermogen werd waargenomen om de SCP positief te beïnvloeden. In alle onderzoekshoofdstukken worden echter verschillen in percepties van supply chain relaties en hun bijhorende resultaten waargenomen tussen de stroomopwaartse en -afwaartse actoren. De waargenomen verschillen in percepties hebben de verschillende mechanismen blootgelegd waarmee de supply chain haar stroomopwaartse en -afwaartse segmenten beheert. Terwijl de formele stroomafwaartse relaties werden beheerd op basis van contracten en vertrouwen, werden de informele stroomopwaartse relaties beheerd op basis van machtsafhankelijkheid en vertrouwen.

In de studiebevindingen werden de volgende belangrijke conclusies getrokken. Door middel van goede leveranciersketensrelaties kunnen de supply chain leden hun eigen prestaties alsook de prestaties van de hele supply chain verbeteren. Omdat percepties van relaties verschillen tussen leden in de keten, moeten supply chain relaties worden aangepast aan de perspectieven, interesses en kenmerken van de respectievelijke supply chain partners. Deze

vastgestelde verschillen in percepties verantwoordt tevens het gebruik van een triade-benadering voor de analyse van supply chain relaties. Met betrekking tot de maïs supply chain, betekenen deze resultaten dat verbeteringen in supply chain relaties het potentieel hebben om de prestaties van de hele supply chain te verhogen. Verbeteringen in de prestatie van de supply chain zullen leiden tot hogere winst en inkomens voor supply chain leden, en daarmee verbeteringen in de levensbeschouwing van de meer dan vier miljoen boeren en handelaren die betrokken zijn bij de maïs supply chain in Oeganda.

De bijdrage van dit proefschrift ligt in het feit dat het de verschillen in perceptie blootstelde, niet alleen tussen stroomafwaarts en stroomopwaarts, maar ook tussen supply chain leden. De waargenomen verschillen in perceptie hebben de verschillende mechanismen blootgelegd waarmee de supply chain haar stroomopwaartse en –afwaartse segmenten beheert. Dit geeft dus praktisch bewijs en ondersteuning voor het gebruik van een triade als een eenheid van de theorie en analyse in het domein van supply chain management. Het feit dat verbeteringen in prestaties werden waargenomen om de economische tevredenheid te verbeteren, en niet sociale tevredenheid, geeft argumenten om tevredenheid verder te bestuderen in termen van zowel de economische als sociale dimensie. Aanvullende bijdrage ligt in de focus op de agribusiness supply chain in een ontwikkelingsland, een dimensie die weinig aandacht heeft gekregen in SCM literatuur. De bevindingen in dit proefschrift hebben dus belangrijke bestuurlijke gevolgen voor agribusiness managers, niet alleen in Oeganda, maar ook in andere ontwikkelingslanden met vergelijkbare supply chain kenmerken.

Annexes

Annexes

Annex I: Questionnaire for the focal firm

Maize supply Chain Management



Note to the respondent: dear respondent, I am a PhD student conducting research on maize value chain management in Uganda. All the information you provide will be handled as strictly confidential (no information to other chain members) and only for academic purposes. This information will only be used for the purpose of this research and to identify your maize value chain partners in order to carry out further interviews.

Questionnaire for Focal Company

Questionnaire ID:

Name of Company.....

Contacts.....

General information

Q1: Business category Wholesaler Processor	Q 2: Please indicate which type of product your company deals in: Maize Flour Animal feeds Maize Seeds Food (e.g. fortified products) Maize Grain Others (please specify):.....
Q3: Legal status: Stock company Limited company Partnership Co-operative Sole proprietorship Other (please specify):-----	Q4: When was this business started? Q 5: Number of employees in your company..... Q6. Monthly sales (kgs)

For the following questions, please indicate the extent to which you agree/disagree with the given statements using the scale below:

Scale:

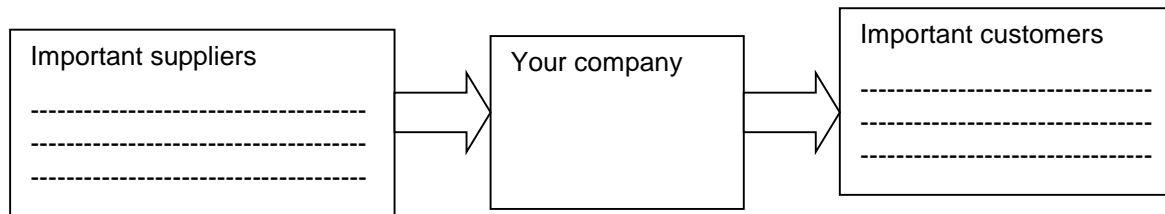
1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree

Business reference information for performance

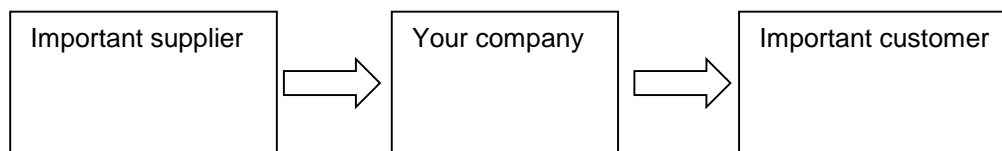
Q7: Please indicate to what extent you agree with the following statements.

Business success	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Our company was profitable in the last 3 years	1	2	3	4	5
Our company achieved business growth in the last 3 years	1	2	3	4	5

Name the most important members of your maize Value chain.



Choose one of your most important supplier and one of your most important customers and answer the following questions related to your maize value chain (maize value chain represented by your company, your chosen supplier and chosen customer)



Reminder to the respondent: Please note that the following questions should be answered specifically for the relationship with the important supplier and customer you nominated.

Q 8: Since when do you have a business relationship with this supplier/ customer?

- Supplier:years.
- Customer:..... years.

VALUE CHAIN PERFORMANCE

Q9: Please indicate to what extent you agree with the following statements related to the performance of your maize Value chain (the chain represents your company, your chosen supplier and customer)

SCN Performance	Your supplier					Your customer					N/A
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	
Efficiency											
Doing business with this supplier/customer helps my company to lower transport costs significantly	1	2	3	4	5	1	2	3	4	5	

SCN Performance	Your supplier					Your customer					N/A
	<i>Strongly disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly agree</i>	<i>Strongly disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly agree</i>	
Doing business with this supplier/customer helps my company to maintain acceptable profitability	1	2	3	4	5	1	2	3	4	5	
Doing business with this supplier/customer helps our company to significantly reduce transaction costs (e.g. information costs, searching costs and monitoring costs)	1	2	3	4	5	1	2	3	4	5	
Responsiveness											
Doing business with this supplier/customer helps my company to reduce lead time (time from sending/getting the request till reply)	1	2	3	4	5	1	2	3	4	5	
Doing business with this supplier/customer contributes to reducing customer/consumer complaints	1	2	3	4	5	1	2	3	4	5	
Doing business with this supplier/customer enable our company to deliver products on time	1	2	3	4	5	1	2	3	4	5	
Quality											
Doing business with this supplier/customer enables my company to produce high quality products	1	2	3	4	5	1	2	3	4	5	

SCN Performance	Your supplier					Your customer					N/A
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	
Doing business with this supplier/customer helps my company to manage product safety (e.g. free from mycotoxins)	1	2	3	4	5	1	2	3	4	5	
Doing business with this supplier/customer helps my company to Value more attractive products (e.g. Right MC, broken seeds, foreign bodies, viability, nutritious)	1	2	3	4	5	1	2	3	4	5	
Chain balance <i>** (e.g. What customers in other markets require (quality, quantity, timing), access to finance, sharing of resources)</i>											
Doing business with our supplier/customer contributes to a more balanced distribution of risks and benefits along the chain	1	2	3	4	5	1	2	3	4	5	
Doing business with our supplier/customer helps my company to better understand other chain members' interests	1	2	3	4	5	1	2	3	4	5	

BUSINESS RELATIONSHIPS

Q10: Please score to what extent you agree with the following statements on your business relationships with your chosen supplier and chosen customer

<i>Trust, commitment, information sharing</i>	<i>Your supplier</i>					<i>Your customer</i>				
	<i>Strongly disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly agree</i>	<i>Strongly disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly agree</i>
<i>Trust</i>										
This supplier/customer does keep their promises	1	2	3	4	5	1	2	3	4	5
Our company has high confidence in this supplier/customer	1	2	3	4	5	1	2	3	4	5
We believe that the information this supplier/customer provides us is always correct	1	2	3	4	5	1	2	3	4	5
This supplier/customer does not consider how their decisions/actions may affect our business*	1	2	3	4	5	1	2	3	4	5
<i>Commitment</i>										
We expect our relationship with this supplier/customer to continue for a long time	1	2	3	4	5	1	2	3	4	5
We would like to continue to cooperate with this supplier/customer	1	2	3	4	5	1	2	3	4	5
We expect our relationship with this supplier/customer to strengthen over time	1	2	3	4	5	1	2	3	4	5

This supplier/Customer has invested considerable effort and resources in building this relationship	1	2	3	4	5	1	2	3	4	5
Information sharing										
This supplier/customer informs us in advance of any changing needs	1	2	3	4	5	1	2	3	4	5
This supplier/customer is expected to provide us with any information which might be helpful for our business operations	1	2	3	4	5	1	2	3	4	5
This supplier/customer is expected to keep us informed about events or changes that may affect us (e.g. products and services, markets)	1	2	3	4	5	1	2	3	4	5
Exchange of information between our company and this supplier/customer takes place frequently	1	2	3	4	5	1	2	3	4	5

Q11: Please score to what extent you agree with the following statements on your business relationships with your chosen supplier and chosen customer

Power, Dependency, conflict	Your Supplier					Your customer				
	<i>Strongly disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly agree</i>	<i>Strongly disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly agree</i>
Dependency										
Our company is not significantly dependent on this supplier's/customer's resources (e.g. transport facilities, financial resources)*	1	2	3	4	5	1	2	3	4	5
Our company is significantly dependent on this supplier's/customer's capabilities (e.g. expertise)	1	2	3	4	5	1	2	3	4	5
Our company can easily replace this supplier/customer*	1	2	3	4	5	1	2	3	4	5
Non-Coercive power										
Our company receives benefits from supplier/customer when we regularly meet their requirements (e.g. financial support or market information)	1	2	3	4	5	1	2	3	4	5
This supplier/customer rewards our company without requiring specific behaviour in return (e.g. financial support, better prices)	1	2	3	4	5	1	2	3	4	5
Coercive power										

Power, Dependency, conflict	Your Supplier					Your customer				
	<i>Strongly disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly agree</i>	<i>Strongly disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly agree</i>
We cannot be sure that this supplier/customer will not retaliate on our company (terminate the contract /lower prices) when we do not accept their business proposals	1	2	3	4	5	1	2	3	4	5
We cannot be sure that this supplier/customer will not neglect our interests (e.g. terminate the contract without any notice) even if we fully meet the conditions detailed in the contract with them	1	2	3	4	5	1	2	3	4	5
Conflict										
We disagree with this supplier/customer on critical issues	1	2	3	4	5	1	2	3	4	5
Our business interest doesn't match with that of this supplier/customer	1	2	3	4	5	1	2	3	4	5
We often have debates with this supplier/customer on several issues	1	2	3	4	5	1	2	3	4	5

Q 12: Please indicate to what extent you agree with the following statements related your satisfaction with your maize Value chain (the chain represents your company, your chosen supplier and your chosen customer)

<i>Satisfaction</i>	<i>Your supplier</i>					<i>Your customer</i>				
	<i>Strongly disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly agree</i>	<i>Strongly disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly agree</i>
Social satisfaction										
This supplier/customer hardly considers our arguments when changing prices*	1	2	3	4	5	1	2	3	4	5

<i>Satisfaction</i>	<i>Your supplier</i>					<i>Your customer</i>				
	<i>Strongly disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly agree</i>	<i>Strongly disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly agree</i>
This supplier/customer leaves our company in the dark about what we ought to know*	1	2	3	4	5	1	2	3	4	5
Interaction between our company and this supplier/customer is characterised by mutual respect	1	2	3	4	5	1	2	3	4	5
This supplier/customer expresses criticisms tactfully	1	2	3	4	5	1	2	3	4	5
Economic satisfaction										
Our business relationship with this supplier/customer significantly contributes to our profitability	1	2	3	4	5	1	2	3	4	5
Our business relationship with this supplier/customer is very attractive because of getting fair prices	1	2	3	4	5	1	2	3	4	5
This supplier/customer provides our company with marketing and sales support of high quality	1	2	3	4	5	1	2	3	4	5
Our relationship with this supplier/customer has provided our company with a dominant market position	1	2	3	4	5	1	2	3	4	5

BUSINESS ENVIRONMENT

Note to respondent: Please answer the following questions with respect to the nature of product(s) that your company deals in

Q13. Please indicate the extent to which you agree with the following statements

Moderating factors	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Product characteristics					
Production in our company can best be described as standard products	1	2	3	4	5
Production in our company can best be described as standard product modified to customer specifications	1	2	3	4	5
Production in our company can best be described as customized products	1	2	3	4	5
Demand uncertainty					
Our master production schedule has a high degree of variation due to changes demand	1	2	3	4	5
The demand for our products fluctuates drastically from month to month	1	2	3	4	5
There are always many buyers for our products*	1	2	3	4	5
The quality specification of the products demanded by our most important customer is always unstable	1	2	3	4	5
Supply uncertainty					
Our most important supplier consistently meet our supply requirements*	1	2	3	4	5
The quality of maize supplied by our most important supplier is always stable and consistent*	1	2	3	4	5
Our supply requirements vary drastically from month to month	1	2	3	4	5
Price uncertainty					
The price of our products varies significantly from month to month	1	2	3	4	5

Annex II: Questionnaire for the supplier

Maize supply chain management



Note to the respondent: dear respondent, I am a PhD student conducting research on maize value chain management in Uganda. All the information you provide will be handled as strictly confidential (no information to other chain members) and only for academic purposes. This information will only be used for the purpose of this research and to identify your maize value chain partners in order to carry further research

Questionnaire for supplier

Questionnaire ID.....

Name of Company.....
 Contacts.....

General information

Q1: Business category - Wholesaler - Retailer - Itinerant trader - Farmer - Processor	Q 2: Please indicate which type of product you deal in - Maize Flour - Animal feeds - Seeds - Food (fortified food products) - Maize Grain - Others(please specify):.....
Q3: Legal status: - Stock company - Limited company - Unlimited partnership - Co-operative - Sole proprietorship - Other (please specify):----- --	Q4: When was this business started? Q 5: Number of employees in your company..... Q6. Monthly sales (kgs)

For the following questions, please indicate the extent to which you agree/disagree with the given statements using the scale below.

Scale:

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree

Business performance reference information

Q7: Please indicate to what extent you agree with the following statements

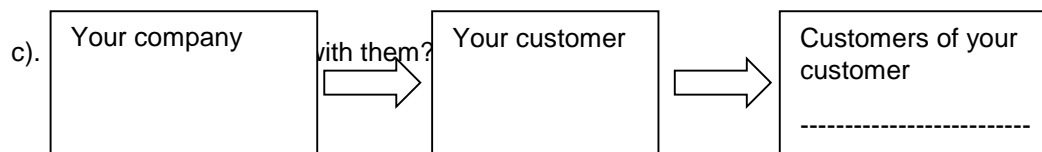
Business success	Strongly disagree	Disagree	Neutral	Agree	Strongly disagree
Our company was profitable in the last 3 years	1	2	3	4	5
Our company achieved business growth in the last 3 years	1	2	3	4	5

Value chain performance

Your company was mentioned by.....as their major supplier,

Q8. a), Do you know any of the customers of this customer? 1=Yes 0=No

b), If yes in (a) above, please indicate the name(s) of the customers of this customer below.



Reminder to the respondent: For the remainder of the questions, please answered specifically for the business relationship with the customer you have nominated

Q9: Since when do you have a business relationship with this customer?.....(years)

VALUE CHAIN PERFORMANCE

Q10: Please indicate to what extent you agree with the following statements related to the performance of your maize value chain.

Value chain performance	Your customer					
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	N/A
Efficiency						
Doing business with this customer helps my company to lower transport costs significantly	1	2	3	4	5	
Doing business with this customer helps my company to maintain acceptable profitability	1	2	3	4	5	
Doing business with this customer helps our company to significantly reduce transaction costs (e.g. information costs, searching costs and monitoring costs)	1	2	3	4	5	
Responsiveness						
Doing business with this customer helps my company to reduce lead time (time from sending/getting the request till reply)	1	2	3	4	5	
Doing business with this customer contributes to reducing customer complaints	1	2	3	4	5	
Doing business with this customer enables my company to deliver products on time	1	2	3	4	5	
Quality						
Doing business with this customer enable my company to produce high quality products	1	2	3	4	5	
Doing business with this customer helps my company to manage product safety	1	2	3	4	5	
Doing business with this customer helps my company to Value more attractive products	1	2	3	4	5	
Chain balance						
Doing business with this customer contributes to a more balanced distribution of risks and benefits along the chain	1	2	3	4	5	
Doing business with this customer helps my company to better understand other chain members' interests	1	2	3	4	5	

BUSINESS RELATIONSHIPS

Q11: Please indicate to what extent you agree with the following statements on your business relationships with your customer:

Trust, commitment, information sharing	Your customer				
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Trust					
This customer keeps their promises	1	2	3	4	5
Our company has high confidence in this customer	1	2	3	4	5
We believe that the information this customer provides us is always correct	1	2	3	4	5
This customer does not consider how their decisions/ actions may affect us*	1	2	3	4	5
Commitment					
We expect our relationship with this customer to continue for a long time	1	2	3	4	5
We would like to continue to cooperate with this customer	1	2	3	4	5
We expect our relationship with this customer to strengthen over time	1	2	3	4	5
This customer has invested considerable effort and resources in building this relationship	1	2	3	4	5
Information sharing					
This customer informs us in advance of any changing needs	1	2	3	4	5
This customer is expected to provide us with any information which might be helpful for our business operations	1	2	3	4	5
This customer is expected to keep us informed about events or changes that may affect us (e.g. products and services, markets)	1	2	3	4	5
Exchange of information between our company and this customer takes place frequently	1	2	3	4	5

Q12: Please score to what extent you agree with the following statements on your business relationships with your customer

Power, Dependency, Conflict	Your customer				
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Dependency					
Our company is not significantly dependent on this customer's resources (e.g. transport facilities, financial resources)*	1	2	3	4	5
Our company is significantly dependent on this customer's capabilities (e.g. expertise)	1	2	3	4	5
Our company can easily replace this customer*	1	2	3	4	5
Non-coercive power					
Our company receives benefits from this customer when we regularly meet their requirements (e.g. financial support, market information)	1	2	3	4	5
This customer rewards our company without requiring specific behaviour in return (financial support, better prices)	1	2	3	4	5
Coercive power					
We cannot be sure that this customer will not retaliate on our company (terminate the contract, lower prices) when we do not accept their business proposals	1	2	3	4	5

Power, Dependency, Conflict	Your customer				
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
We cannot be sure that this customer will not neglect our interests (e.g. terminate the contract without any notice) even if we fully meet the conditions detailed in the contract with them	1	2	3	4	5
Conflict					
We disagree with this customer on critical issues	1	2	3	4	5
Our business interest does not match with that of this customer	1	2	3	4	5
We often have debates with this customer on several issues	1	2	3	4	5

Q13: Please indicate to what extent you agree with the following statements related to your satisfaction with your maize value chain

Satisfaction	Your customer				
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Social satisfaction					
This customer hardly considers our arguments when changing prices*	1	2	3	4	5
This customer leaves our company in the dark about what we ought to know*	1	2	3	4	5
The interaction between our company and this customer is characterised by mutual respect	1	2	3	4	5
This customer expresses criticisms tactfully	1	2	3	4	5
Economic satisfaction					
This business relationship with our customer significantly contributes to our profitability	1	2	3	4	5
Our business relationship with this customer is very attractive because of getting fair prices	1	2	3	4	5
This customer provides my company with marketing and sales support of high quality	1	2	3	4	5
Our relationship with this customer has provided our company with a dominant market position	1	2	3	4	5

BUSINESS ENVIRONMENT

Note to respondent: Please answer the following questions with respect to the nature of product(s) that your company deals in/produces

Q14: Please indicate the extent to which you agree with the following statements

Moderating factors	<i>Strongly disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly agree</i>
Product characteristics					
Production in our company can best be described as standard products	1	2	3	4	5
Production in our company can best be described as standard product modified to customer specifications	1	2	3	4	5
Production in our company can best be described as customized products	1	2	3	4	5
Demand uncertainty					
Our master production schedule has a high degree of variation due to changes demand	1	2	3	4	5
The demand for our products fluctuates drastically from month to month	1	2	3	4	5
There are always many buyers for our products*	1	2	3	4	5
The quality specification of the products demanded by our most important customer is always unstable					
Supply uncertainty					
Our most important supplier consistently meet our supply requirements*	1	2	3	4	5
The quality of maize supplied by our most important supplier is always stable and consistent*	1	2	3	4	5
Our supply requirements vary drastically from month to month	1	2	3	4	5
Price uncertainty					
Price of our product (s) varies significantly from month to month	1	2	3	4	5

Annex III: Questionnaire for the customer



Note to the respondent: dear respondent, I am a PhD student conducting research on maize value chain management in Uganda. All the information you provide will be handled as strictly confidential (no information to other chain members) and only for academic purposes. This information will only be used for the purpose of this research and to identify your maize value chain partners in order to carry out further research

Name of Company.....
 Contacts.....

GENERAL INFORMATION

Q1: Business category - Distributor - Retailer - Processor	Q 2: Please indicate which type of product you deal in - Maize Flour - Animal feeds - Seeds - Food (e.g. fortified food products) - Maize Grain - Others(please specify):.....
Q3: Legal status: - Stock company - Limited company - Partnership - Co-operative - Sole proprietorship - Other (please specify):----- --	Q4: When was this business started? <hr/> Q 5: Number of employees in your company..... <hr/> Q6. Monthly sales (kgs)

For the following questions, please indicate the extent to which you agree/disagree with the given statements using the scale below.

Scale:

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree

BUSINESS REFERENCE INFORMATION FOR PERFORMANCE

Q7. Please indicate to what extent you agree with the following statements

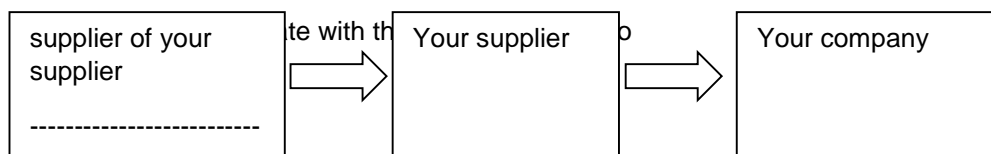
Business success	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Our company was profitable in the last 3 years	1	2	3	4	5
Our company achieved business growth in the last 3 years	1	2	3	4	5

VALUE CHAIN PERFORMANCE

Your company was mentioned by.....as their major customer,

- Q8.** a), Do you know any of the suppliers of this supplier? 1=Yes 0=No
 b), If yes in (a) above, please indicate the name(s) of the supplier of this supplier below.

Name the most important suppliers of your company



Reminder to the respondent: Please note that the following questions should be answered specifically for the relationship with the supplier you nominated.

Q9: Since when do you have a business relationship with this supplier?.....(year)

VALUE CHAIN PERFORMANCE

Q10: Please indicate to what extent you agree with the following statements related to the performance of your maize value chain (the value chain represented by your company, your supplier and the suppliers of your supplier)

Value chain performance	Your supplier					
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	N/A
Efficiency						
Doing business with this supplier helps my company to lower transport costs significantly	1	2	3	4	5	
Doing business with this supplier helps my company to maintain acceptable profitability	1	2	3	4	5	
Doing business with this supplier helps our company to significantly reduce transaction costs (e.g. information costs, searching costs and monitoring costs)	1	2	3	4	5	
Responsiveness						
Doing business with this supplier helps my company to reduce lead time (time from sending/getting the request till reply)	1	2	3	4	5	
Doing business with this supplier contributes to reducing customer/consumer complaints	1	2	3	4	5	
Doing business with this supplier enable our company to deliver products on time	1	2	3	4	5	
Quality						
Doing business with our supplier helps my company to manage product safety (e.g. free from mycotoxins)	1	2	3	4	5	
Doing business with our supplier helps my company to produce more attractive products (e.g. Right MC, broken seeds, foreign bodies, viability, nutritious)	1	2	3	4	5	
Doing business with this supplier enables my company to produce high quality products	1	2	3	4	5	
Chain balance						
Doing business with this supplier contributes to a more balanced distribution of risks and benefits along the chain	1	2	3	4	5	
Doing business with this supplier helps my company to better understand other chain members' interests	1	2	3	4	5	

BUSINESS RELATIONSHIPS

Q11: Please score to what extent you agree with the following statements on your business relationships with your supplier

<i>Trust, commitment, information sharing</i>	<i>Your supplier</i>				
	<i>Strongly disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly agree</i>
<i>Trust</i>					
This supplier keeps their promises	1	2	3	4	5
Our company has high confidence in this supplier	1	2	3	4	5
We believe that the information this supplier provides us is always correct	1	2	3	4	5
This supplier does not consider how their decisions/ actions may affect us*	1	2	3	4	5
<i>Commitment</i>					
We expect our relationship with this supplier to continue for a long time	1	2	3	4	5
We would like to continue to cooperate with this supplier	1	2	3	4	5
We expect our relationship with this supplier to strengthen over time	1	2	3	4	5
This supplier has invested considerable effort and resources in building this relationship	1	2	3	4	5
<i>Information sharing</i>					
This supplier informs us in advance of any changing needs	1	2	3	4	5
This supplier is expected to provide us with any information which might be helpful for our business operations	1	2	3	4	5
This supplier is expected to keep us informed about events or changes that may affect us (e.g. products and services, markets)	1	2	3	4	5
Exchange of information between our company and this supplier takes place frequently	1	2	3	4	5

Q12: Please score to what extent you agree with the following statements on your business relationships with your supplier

Power and dependency	Supplier				
	<i>Strongly disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly agree</i>
<i>Dependency</i>					
Our company is significantly dependent on this supplier's resources (e.g. transport facilities, financial resources)*	1	2	3	4	5
Our company is significantly dependent on this supplier's capabilities (soft skills, such as expertise)	1	2	3	4	5
Our company can easily replace this supplier*	1	2	3	4	5
<i>Non-coercive power</i>					
Our company receives benefits from this supplier when we regularly meet their requirements (e.g. financial support, market information)	1	2	3	4	5
This supplier rewards our company without requiring specific behaviour in return (e.g. financial support, better prices)	1	2	3	4	5
<i>Coercive power</i>					
We cannot be sure that this supplier will not retaliate on our company (e.g. terminate contract, lower prices) when we don't accept their business proposal	1	2	3	4	5

Power and dependency	Supplier				
	<i>Strongly disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly agree</i>
We can't be sure that this supplier will not neglect our interests (terminate the contract without any notice) even if we fully meet the conditions detailed in the contract with them	1	2	3	4	5
Conflict					
We disagree with this supplier on critical issues	1	2	3	4	5
Our business interest doesn't match with that of this supplier	1	2	3	4	5
We often have debates with this supplier on several issues	1	2	3	4	5

Q13: Please indicate to what extent you agree with the following statements related your satisfaction with your maize value chain

<i>Satisfaction</i>	<i>Your supplier</i>				
	<i>Strongly disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly agree</i>
Social satisfaction					
This supplier hardly considers our arguments when changing prices*	1	2	3	4	5
This supplier leaves our company in the dark about what we ought to know	1	2	3	4	5
The interaction between our company and this supplier is characterised by mutual respect*	1	2	3	4	5
Our supplier expresses criticisms tactfully	1	2	3	4	5
Economic satisfaction					
Our business relationship with this supplier significantly contributes to our profitability	1	2	3	4	5
Our business relationship with this supplier is very attractive because of getting fair prices	1	2	3	4	5
This supplier provides my company with marketing and sales support of high quality	1	2	3	4	5
Our relationship with this supplier has provided our company with a dominant market position	1	2	3	4	5

BUSINESS ENVIRONMENT

Note to respondent: Please answer the following questions with respect to the nature of product(s) that you company deals in

Q14: Please indicate the extent to which you agree with the following statement

Moderating factors	<i>Strongly disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly agree</i>
Product characteristics					
Production in our company can best be described as standard products	1	2	3	4	5
Production in our company can best be described as standard product modified to customer specifications	1	2	3	4	5
Production in our company can best be described as customized products	1	2	3	4	5
Demand Uncertainty					
Our master production schedule has a high degree of variation due to changes demand	1	2	3	4	5
The demand for our products fluctuates drastically from month to month	1	2	3	4	5
There are always many buyers for our products*	1	2	3	4	5
The quality specification of the products demanded by our most important customer is always unstable	1	2	3	4	5
Supply uncertainty					
Our most important supplier consistently meet our supply requirements*	1	2	3	4	5
The quality of maize supplied by our most important supplier is always stable and consistent*	1	2	3	4	5
Our supply requirements vary drastically from month to month	1	2	3	4	5
Price uncertainty					
Price of our products varies significantly from month to month	1	2	3	4	5

Curriculum Vitae

Curriculum Vitae

Biography

Walter Odongo was born on December 24, 1978 in the present day Dokolo district, Northern Uganda. He obtained a Bachelor of Science degree in Agriculture in 2004, and a Master's of Science degree in Agricultural and Applied Economics in 2013 from Makerere University, Kampala. He obtained a Post Graduate Diploma in Project planning and Management in 2006 from Gulu University. In October 2013, Walter embarked on a doctoral research at Ghent University, Belgium. He successfully completed the Doctoral Training Program in Applied Biological Sciences (Agricultural Sciences) in the department of Agricultural Economics, Faculty of Bioscience Engineering in December 2017. Walter has participated in several international scientific conferences, seminars and workshops with oral contributions. Walter has several research articles published in international peer reviewed journals. Walter has specialised skills and interests in project proposal writing and implementation, supply chain management research, agricultural and rural development, and designing and managing outreach interventions. Currently, he is a lecturer of Agricultural Economics in the department of Rural Development and Agribusiness, Faculty of Agriculture and Environment, Gulu University, in Uganda.

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Faculty of Agriculture and Environment, Gulu University,
P.O. Box 166 Gulu, Uganda

Tel (mobile): +256 777036100/+256 701036100

Email: odongo78@gmail.com/ w.odongo@gu.ac.ug

Skype: odongo. walter

Education

2013	Masters of Science in Agricultural and Applied Economics, Makerere University, Uganda.
2006	Post Graduate Diploma in Project Planning and Management, Gulu University, Uganda.
2004	Bachelor of Science in Agriculture, Makerere University, Uganda.

Work experience

October 2013 to date

Ph.D. Researcher, Department of Agricultural Economics, Faculty of Bioscience Engineering, Ghent University (BE).

Job responsibilities: Research on relationship quality and supply chain performance in agribusiness supply chains; writing peer-reviewed papers; Participation in international scientific conferences, seminars and workshops with oral contributions; and proposal writing to attract national and international project funding.

October 2005 to Date

Lecturer, Faculty of Agriculture and Environment, Gulu University.

Job responsibilities: Teaching (*Sociology, Research methods, Project planning and management; Marketing, Entrepreneurship, Communication skills, micro/macro-economics*); Coordinating outreach programs; supervision of graduate and undergraduate students research; writing research and development proposals.

Specialised training

October, 2016

Leadership foundation course, Ghent University

September, 2016

Plunge into your Own Business Plans, Ghent University

March, 2016

Certificate course in Learning, action research and outreach for inclusive development, ICRA, the Netherlands

December, 2013

Advanced academic English: Writing skills- Bioscience Engineering

September, 2011

Food security fellowship training at Oklahoma State University, USA.

August 2010

Certificate Course in research data management and analysis

Supervision of MSc. students

1. MSc. Title: *The contribution of wild fruits and vegetables to household nutrition in Acholi Sub-region of Uganda*. Student: Lawrence Okidi. Institution: Gulu University. Status: Completed
2. MSc. Title: *Influence of trust and power on informal agribusiness supply chains performance, the case of maize and tomatoes*. Student: Auma Juliet Ochaya. Institution: Gulu University; Status: On-going
3. MSc. Title: *Integrating nutrition in household food production: a case study of Lango sub region of Uganda*. Student: Elinga Maxwell. Institution: Gulu University. Status: On-going

Research funding

- 2016: Manager for the project “Agronomic Bio fortification to improve iodine intake in Northern Uganda: a stakeholder based approach” funded by VLIR-UOS, Belgium.
- 2012: Project manager for the “Consolidation of peace through strengthening Women’s Economic Associations in Northern Uganda”, funded by the World Bank.
- 2011: Co-researcher for the project “Unlocking the potential of edible insects for improved food security, nutrition and adaptation to climate change in the Lake Victoria basin, NR-05-10, Funded by Inter-University Council for East Africa
- 2010: Leader of the project “Capacity Building of smallholder farmers in Gulu District in Agribusiness and Entrepreneurship skills, funded by JICA

Publications in A1 Journals

1. Odongo, W., Dora, M., Molnár, A., Ongeng, D., & Gellynck, W. (2017). Role of power in supply chain performance: Evidence from agribusiness SMEs in Uganda. *Journal of Agribusiness in Developing and Emerging economies*, 7(3), pp.1-18
2. Odongo, W., Dora, M., Molnár, A., Ongeng, D., & Gellynck, X. (2016). Performance perceptions among food supply chain members: a triadic assessment of the influence of supply chain relationship quality on supply chain performance. *British Food Journal*, 118(7), 1783-1799.
3. De Steur, H., Odongo, W., & Gellynck, X. (2016). Applying the food technology neophobia scale in a developing country context. A case-study on processed *matooke* (cooking banana) flour in Central Uganda. *Appetite*, 96, 391-398.

Other publications

1. Okia C.A., Odongo W., Nzabamwita P., Ndimubandi J., Nalika N., and Nyeko, P, 2017. Local knowledge and practices on use and management of edible insects in Lake Victoria basin, East Africa. *Journal of Insects as Food and Feed*, pp.1-12.
2. Odongo, W., Kalule, S., Kule, E., Ndyomugenyi, E., Omara, P., & Ongeng, D. (2017). Responsiveness of agricultural training curricula in African universities to labour market needs: the case of Gulu University in Uganda. *African Journal of Rural Development*, 2(1), 67-76.
3. Kalule S.W., Odongo W., Kule E., E.K. Ndyomugenyi E.K., Omara., P., and Ongeng D. 2016. Conceptualizing Student-Centred Outreach Model for experiential learning and community transformation. *African Journal of Rural Development*, Vol. 1(3): 2016: pp. 219 – 227.
4. Kalule, S. W, Mugonola, B, Odongo, W & Ongeng, D. University student-centred outreach for rural innovations and community transformation in northern Uganda. *Proceedings of the Fourth RUFORUM Biennial Regional Conference 21 - 25 July 2014, Maputo, Mozambique.*

Conference presentations

1. Relationship Quality and Performance in Supply Chain Networks- a literature review” a paper presented at the 11th Wageningen International Conference on Chain and Network Management at Anacapri, Naples (Italy), June 4th- 6th, 2014.
2. The effect of power on supply chain performance: *Does supply chain members’ perceptions differ?’* A paper presented at the International Conference on Agribusiness in Emerging Economies, January 6-7, 2016 in Anand, India.
3. Performance perceptions among supply chain members: *A triadic assessment of the influence of supply chain relationship quality on supply chain performance.* A paper presented at the 10th IGLS Forum, February 15-18, 2016.
4. Conceptualizing satisfaction in triadic supply chains: Is it an antecedent or a consequence of relationship quality”. A paper presented at the 26th Annual IFAMA World Conference & 12th Wageningen International Conference on Chain and Network Management (WICANEM), Aarhus, Denmark | June 19 – 23, 2016.
5. What comes first, ‘satisfaction’ or ‘relationship quality’? Evidence from agribusiness SMEs. A paper presented at the 5th World Conference on Production and Operations Management, 6-10, September 2016 – Havana –Cuba.
6. Effect of supply chain performance on supply chain satisfaction. A paper presented at the 11th IGLS-Forum, February 13th-17th, 2017.

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Hope, that stubborn thing inside us that insists, despite all the evidence to the contrary, that something better awaits us so long as we have the courage to keep reaching, to keep working, and to keep fighting.

...Barack Obama
