Drivers, Boundaries and Performance Outcomes of Coopetition Capability: A Study of Small and Medium-sized Enterprises in a Developing Economy

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Intellectual property statement

I, Stella Zulu-Chisanga, confirm that the work herein presented is my own and that where reference has been made to other works, due credit has been given.

Dedications

To my parents - Mr and Mrs M.B Zulu, my loudest cheerleaders, for always believing in me even when I didn't believe in myself. Thank you for your unconditional love, support and prayers.

To my incredibly wonderful children: Joel, Valerie and Dylan (expected), for bringing out the best in me-constantly challenging and reminding me the importance of a work-life balance and that family is the most important part of my life. Walking through this PhD journey with you in my life has been even more fulfilling. May you attain more than mummy ever has!

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Abstract

With the growing globalisation and rapid technological change in today's business world, an increasing number of firms in several industries are adopting coopetition - simultaneous pursuit of cooperation and competition, as a strategic tool to improve competitiveness and performance. The logic driving this phenomenon is that since competitors face similar challenges, they may possess diverse resources and capabilities that may benefit each other. Despite its strategic importance to firms, it has been argued that coopetition may undermine firms' survival as it exhibits difficulties such as misunderstandings, opportunism and appropriation concerns. In recent years, coopetition scholars have suggested that for firms to benefit from coopetition as a core strategic tool, firms need to develop coopetition capability to manage the opportunities and challenges associated with cooperating with competitors. Notwithstanding its theoretical appeal to the academic community and interests from managers, current understanding of conceptual domain, development and outcomes of coopetition capability is lacking in the scholarly strategy literature, and small business research is particularly lacking on this topic. Accordingly, the aim of this study is to address this gap in the literature.

The study draws insights from the dynamic capability perspective, institutional theory and resource based view of the firm to develop a model of the drivers, boundary conditions and performance outcomes of coopetition capability. The model is tested in an empirical study of small and medium-sized firms in Zambia, a sub-Saharan African economy. Findings from the study help advance the small business strategy literature in several ways. First, findings show that coopetition capability comprises five distinct but related dimensions that collectively have a positive effect on coopetition performance. Second, while institutional support is negatively associated with coopetition capability, managerial ties and coopetition learning process are positively related to coopetition capability. Third, coopetition capability has an indirect effect on financial performance through coopetition performance. Fourth, while coopetition capability is positively associated with coopetition performance, this relationship becomes stronger when institutional support and coopetition learning process are lower. The study discusses theoretical, managerial and policy implications of the findings whilst providing valuable avenues for future research.

Keywords:

Coopetition capability, institutional support, managerial ties, coopetition learning process, coopetition performance, interfirm relationship, SMEs.

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Chapter 1 : Introduction to the study

"The test of a first-rate intelligence is the ability to hold two opposing ideas in mind at the same time and still retain the ability to function."(F. Scott Fitzgerald).

1.1 Introduction

The aim of this chapter is to introduce the topic of study. A research background and gaps in the literature that motivate the study as well as research objectives are discussed. Expected contributions of the study at the theoretical, empirical, practical and contextual levels are then presented. The chapter ends with an outline of this thesis.

1.2 Research background

The worldwide trends of globalisation, technological evolution and market liberalisation are not only restructuring markets but also challenging traditional approaches to enhancing a firm's performance. Indeed, in today's dynamic and complex business world, it appears that a firm's ability to compete is tied to its ability to cooperate with key market and non-market players (Baron, 1995; Baron, 1999; Mazzola and Perrone, 2013). Focusing on market players, the literature identifies the players to include customers, suppliers, distributors and competitors (Peng and Luo, 2000). Within the context of a firm's cooperation with market actors, past research has extensively examined a firm's cooperation with customers, suppliers and distributors, while efforts to study the dynamics of a firm's cooperation with competitors remain limited and fragmented, and often subsumed within the broader notion of interfirm cooperation. In studying interfirm cooperation with a focus on cooperation between a focal firm and its competitors, researchers have begun to look at the concept of coopetition.

The literature on inter-organizational cooperation now recognizes coopetition (or co-opetition) as a new way of doing business, where cooperation occurs between competitors (Brandenburger and Nalebuff, 1996; Bengtsson and Kock, 2000; Ritala, 2012). Coopetition refers to simultaneous pursuit of cooperation and competition (Raza-Ullah et al., 2014), and is generally viewed as a viable resource pooling strategy that enhances firm competitiveness and growth (Gnyawali and Park, 2011; Bengtsson and Johansson, 2014; Bouncken et al., 2017). Brandenburger and Nalebuff (1996) articulate that the increasing inter-operating activities of many industries meant that competing organizations need to cooperate to ensure that their products worked together to create greater market value. In other words, the coopetition logic is that businesses need to give up fighting over division of the pie (customers) and focus on strategies for growing the pie (Henricks, 1996).

Given their lack of key resources, limited market presence, marketplace illegitimacy and dependence upon narrow product and service lines, small and medium-sized (henceforth SMEs) face a plethora of challenges that may inhibit their growth prospects (Bruton, 2010; Bruton and Rubanik, 2002). To prevail, scholars have advocated that in addition to cooperating with other firms in vertical interfirm alliances, SMEs should also develop horizontal cooperative relationships with competitors, coopetition, to pool resources together to strengthen their competitiveness (e.g., Gnyawali and Park, 2009; Bengtsson and Johansson, 2014; Bouncken and Kraus, 2013). The logic is that since competing firms are likely to face similar challenges they may possess diverse resources and capabilities that may benefit each other. As such, it makes sense for competing firms to cooperate to enhance their collective ability to create market value.

For example, the coopetition logic informs the behaviour of Micro Focus (formerly Novell) supply networking software, Netware, to rival high-technology companies to link desktop computers to printers and file servers. Beyond the high-technology industry, evidence shows that the phenomenon is growing steadily in other industries, including steel, manufacturing, airlines and brewery. In the brewery industry, for example, when Avery Brewing Company Limited in Colorado and River Brewing Company Limited in California in the United States discovered in 2008 that they were both producing "Salvation Beer", they pulled resources together to produce and market Craft Beer, which by 2014, has produced a sustained double-digit sales growth.

The role of coopetition may be of particular interest for small businesses in developing economies who face increased vulnerability to environmental shocks, sudden changes in regulation or technology, limited resource base, and shifting customer needs and expectations among other many challenges (Boso et al., 2013; Acquaah, 2007; Hoskisson et al., 2000). As coopetition scholars have suggested, a coopetition strategy may help SMEs generate mutual and individual business successes (Gnyawali and Park, 2009; Bouncken and Kraus, 2013; Ritala et al., 2014). For example, in Asia SMEs tend to overcome their resource constraints by forming clusters which enable member-firms to seek financial resources together and borrow from each other, which reduces general financial costs (Kauffmann, 2005).

Nevertheless, the literature also indicates that coopetition is a challenging strategy and that some firms do not succeed in coopetition as they do not meet their goals for pursuing this strategy (Gnyawali and Park, 2009; Tomlinson and Fai, 2013; Bouncken and Kraus, 2013; Bengtsson and Kock, 2015). For instance, Gnyawali and Park (2009) suggest that while coopetition may help SMEs gain economies of scale, reduce

marketplace uncertainty and risk, and speed up market entry of new products, the risk of technology theft, the challenge of management style misfit, and loss of focal firm control may cost SMEs for cooperating with competitors. While acknowledging the benefits of coopetition to SMEs, Tomlinson and Fai (2013) argue that coopetition comes with risks such as technology leakage to rivals and loss of control over a firm's innovation process. Surprisingly, their study found that cooperation with rivals does not have significant impact on SMEs' success. When Bouncken and Kraus (2013) examined the coopetition–innovation relationship, they found that coopetition can indeed trigger and, at the same time, limit introduction of radical innovations. Taken together, these equivocal findings suggest that coopetition can be both beneficial and costly for SMEs.

Today, scholars seem to agree that coopetition is inherently paradoxical as it involves cooperation between rivals with different identities, motives, and goals to create common values and realise greater private benefits from that value (e.g., Bouncken et al., 2015; Fernandez et al., 2014; Bengtsson et al., 2016). These differences in the partners lead to opportunistic behaviour and tension which in turn inhibits effectiveness in coopetitive relationships and could damage firm performance. As coopetition is now considered an integral part of many firms' strategy agenda, the fundamental question asked by this study is: *how do firms develop coopetition management capabilities to maximize the benefits of coopetition and contain its costs?*

1.3 Gaps in the literature

Currently, the coopetition literature has evolved on this question. Indeed, the fact that coopetition is now considered an integral part of many firms' strategic agenda, issues of how firms form, nurture and benefit from coopetitive arrangements, how they evolve

and adapt to turbulent market environments, and how they manage coopetitive relationships in such environments have become important questions which are attracting increasing scholarly attention (Bouncken et al., 2015). Importantly, recent coopetition studies have drawn attention to a firm's coopetition management mechanisms that may facilitate successful coopetitive relationships (e.g., Gnyawali and Park, 2011; Bengtsson and Johansson, 2014; Raza-Ullah et al., 2014; Tidström, 2014; Fernandez et al., 2014, Gnyawali et al., 2016). In particular, the Bengtsson and Johansson (2014) study demonstrates that SMEs need to develop alliance portfolio management capabilities to survive in coopetitive relationships with larger firms. More recently, Gnyawali et al. (2016) rely on evidence from few cases of firms to identify capabilities necessary for an effective management of coopetitive relationships.

Although active and constructive scholarly debate on the ontological assumptions of coopetition concepts is still ongoing, which is healthy for scientific discourse (Bagozzi et al., 1991), the debate is currently silent on the dynamics and processes that make up coopetition capability. The existing literature is still not clear with respect to how firms develop and benefit from coopetition capability. Despite the heightened interests of SMEs to cooperate with competitors and the current growing scholarly enthusiasm about the coopetition capability concept, the literature is silent particularly on the processes that SMEs undergo to manage their relationships with competitors.

Given the silence in the coopetition literature on the conceptual domain, drivers, boundary conditions and performance outcomes of coopetition capability, this study borrows from existing theory in the broader interfirm relationship management literature list of managerial tools, practices and principles that firms may use to deal with the opportunities and challenges of coopetition (e.g. Kale and Singh, 2007; Kale

and Singh, 2009; Schilke, 2013). For example, Kale and Singh (2007) and Schilke and Goerzen (2010) found that formalized management routines that enable firms effectively manage their strategic alliances had a positive impact on alliance success. In terms of the drivers of such routines, referred to as alliance capability or alliance management capability in the literature, a review of the literature indicates that past research has largely focused on internal firm factors such as alliance experience, and alliance function as drivers of alliance management capability.

To the extent that there appears consistency in literature that firm specific factors foster the development of interfirm relationship management capabilities (e.g., Kale and Singh, 2009; Heimeriks and Duysters, 2007; Schilke and Goerzen, 2010; Sluyts et al., 2011), a closer inspection of this literature indicates that some components of the antecedents have been ignored. Indeed, studies that have examined the influential role played by a firm's resources and capabilities in determining the extent to which a firm develops interfirm relationship management capabilities have largely focussed on organisational level structural factors to the neglect of individual level resources and processes with potential to foster the development of interfirm relationship management capability. For example, the role of managers and learning processes in the development of relationship management capability is lacking in the literature. Yet strategy theorists suggest these to be critical inputs to the development and success of firms' strategic moves and actions (Barney 1991a; Augier and Teece, 2009; Makadok, 2001; Teece, 2012). In addition, the role that institutions play in shaping interfirm relationship management is not explicitly provided for in the literature. Yet, the institutional theory posits that institutions, as reflected in government legislation as well as in the professional and commercial norms of behaviour in a given environment,

constrain firms' strategic actions (Grewal and Dharwadkar, 2002; North, 1990). This suggests massive implications for firms in interfirm relationships.

Furthermore, a review of the previous interfirm relationship management studies shows that contingent factors have been neglected in most of the studies with Schilke (2014a; 2014b) being notable exceptions. Although relatively more of prior dynamic capability studies have examined the conditions under which dynamic capabilities are likely to be more effective for performance, an analysis of the contingency variables studied indicates a focus on external task environmental factors to the exclusion of institutional environmental factors as well as firm specific factors. Actually, Schilke (2014a), Barretto (2010), and Eriksson (2014) acknowledge this gap and recommend that future studies should include other external and internal contingencies in order to give a holistic picture of the dynamic capability-performance relationship.

An additional deficiency of the extant literature is that much of prior research on the broader interfirm relationship and coopetition in particular, has focused on larger organizations located in industrialised economies in North America and Western Europe. The few studies that have examined interfirm cooperation in SMEs are silent on how such firms develop and manage relationships with competitors. Moreover, hardly has any research investigated sub-Saharan African developing economy SMEs' ability to manage relationships with marketplace rivals (Peng and Bourne, 2009). Yet, as George et al. (2016) inform, Africa presents exciting context and rare opportunity to advance knowledge to existing management theories and to test their relevance beyond the developed economy context. Consequently, this study aims to address the apparent lack of scholarly works on the conceptualisation of coopetition capability, its

determinants, consequences, boundary conditions, and applicability to SMEs in a developing economy.

Indeed, the lack of theoretical convergence and empirical work on the coopetition concepts suggests that a research agenda is justified that uses the existing discourse on the coopetition topic as a platform to launch additional empirical enquiry. In fact, the growing importance of the coopetition phenomenon and the recognized dearth of scholarly research on the topic have prompted leading strategy journals such as Long Range Planning to recently call for special issues on the topic. A major concern is that despite the recognized importance of organizational practices that generate an environment for competition and cooperation to occur simultaneously, scholarly research on the topic is limited (Bouncken et al., 2015), particularly in the small business literature (Padula and Dagnino, 2007, Park et al., 2014).

Accordingly, the motivation of this study is to address the aforementioned gaps in the interfirm relationship literature by exploring the questions of how coopetition capability is conceptualised, how coopetition capability benefits or hurts coopeting partners, how firm specific factors and environmental forces drive coopetition capability, and at the same time condition the outcomes of coopetition capability in SMEs operating in developing societies.

1.4 Research questions

In light of the issues discussed above, this study hopes to build on the inter-firm relationship management scholarship in general, and the coopetition studies in particular, by providing answers to the following five questions:

1. What is the nature of coopetition capability and how can it be conceptualised?

2. What factors foster the development of coopetition capability?

3. To what extent is coopetition capability related to coopetition performance?

4. To what extent is coopetition performance related to financial performance?

5. What factors condition the coopetition performance outcomes of coopetition capability?

1.5 Research objectives

In seeking to answer the above research questions, the study aims to extend the current understanding of the conceptual domain of coopetition capability, the factors and processes underlying its development, its performance outcomes and contingencies. To this end, the study proposes, describes and empirically tests a model comprising the antecedents, boundary conditions and performance outcomes of coopetition capability. The results should provide a better understanding of the building blocks and antecedents of coopetition capability, associations between coopetition capability and performance as well as contingencies on the coopetition capability-coopetition performance relationship. Ultimately, the study hopes to provide insights and suggestions to researchers, practitioners and managers on how firms may build their ability to effectively manage coopetition to benefit and enhance financial performance.

1.6 Contributions from the study

The study centres around the way in which coopetition capability develops and enhances performance. Whereas most coopetition research has focussed on the antecedents and performance outcomes of coopetition, research on how firms can manage their coopetitive relationships to benefit from successful relationships is scarce in the literature. This is surprising considering the fact that the literature clearly stresses the existence of challenges and failure in interfirm relationships (e.g., Dyer and Singh, 1998; Koza and Lewin, 2000; Heimeriks and Duysters, 2007). This study introduces

the notion of coopetition capability, defined as a firm's ability to manage cooperative relationships with its competitors in its industry (Gnyawali and Park, 2011). The study argues that coopetition capability is a critical dynamic capability for managing cooperative relationships with competitors that is yet to be clearly accounted for. As little is known about coopetition capability, the study draws from the resource based view, dynamic capability and interfirm relationship literature, to understand its characteristics. The resource based view suggests that a firm is a bundle of valuable and difficult to copy idiosyncratic resources and capabilities (Barney, 1991a). Dynamic capability scholars claim that it is the capabilities by which firm resources are acquired and deployed in ways that match a firm's market environment that explain firm performance variance (e.g., Teece et al., 1997; Eisenhardt and Martin, 2000; Zollo and Winter, 2002; Wang and Ahmed, 2007). Nielsen (2006) argues that to remain competitive in dynamic markets of today, firms must also possess strong dynamic capabilities for developing and renewing resources and organizational capabilities. In fact, Eisenhardt and Martin (2000) state that dynamic capabilities consist of specific strategic and organizational processes including product development, alliancing, and strategic decision making that create value for firms within dynamic markets by manipulating resources into new value-creating strategies.

Thus, building on these theoretical notions, the study focuses on a firm's processes and routines that collectively endowed it with a capability for managing cooperative relationships with competitors. By so doing, the study helps us to learn more about coopetition performance heterogeneity that is how some firms become successful in coopetitive relationships and achieve superior performance while other firms do not. The understanding is that the capability to manage cooperative relationships with competitors—coopetition capability—accelerates a firm's access to and transfer of

knowledge and other key resources embedded in its competitors which have relevant effect on company growth and competitiveness.

On that account, the study's first theoretical contribution lies in its conceptualisation of the coopetition capability construct. Consistent with Schilke and Goerzen's (2010) conceptualization of alliance management capability, the study demonstrates that coopetition management competence comprises interfirm coopetition coordination, coopetition portfolio coordination, coopetition learning, coopetition proactiveness, and coopetition transformation. These five organizational routines enable firms to effectively and efficiently manage their coopetition arrangements towards successful outcomes. To the author's knowledge, the study is the first to build on and validate Schilke and Goerzen's (2010) work on the conceptualization of interfirm relationship management capability as a multidimensional construct in the context of cooperation with competitors in developing economies. By doing so, the study provides a reliable and valid coopetition capability instrument that coopetition researchers might use and therefore lays a strong foundation for future research in an effort to investigate interfirm relationship management capability including the coopetition context.

Another clear contribution of the study lies in the development and empirically testing of a theoretical model consisting of drivers, boundary conditions and performance outcomes of coopetition capability. The study uncovers knowledge on the antecedents of coopetition capability. More precisely, the study advances knowledge on how managerial ties, coopetition learning process and institutional support lead to the development of coopetition capability. Whereas the literature is silent on the role of managerial ties in building interfirm relationship management capabilities and success, and thus this study advances knowledge in this area, alliance scholars have examined

alliance learning process as an antecedent to alliance success. Surprisingly, empirical research on the relationships among learning mechanisms, management capability and relationship success is missing and the links remain somewhat confusing in the literature. This study therefore represents the first of the studies to untangle the relationships among these three constructs simultaneously.

In addition, while previous research has been effective in using the resource based view, transaction costs theory and game theory to explain the drivers of coopetition as joint value creation, access to resources and efficiency achievement among others, it is quite surprising, that no research has shown signs of appreciating the role of institutions in shaping coopetition. This has denied researchers and practitioners of a thorough understanding of the coopetition phenomenon because firms are embedded not only in the institutional arrangement in their industry, but also in country-specific institutional settings, which should not be ignored when analysing firm behaviour. Ahlstrom and Bruton (2010) share this view and call for the need for researchers to evaluate institutional characteristics of a country with regard to a specific phenomenon rather than in terms of general arrangements. One possible explanation to the lack of application of the institutional theory could be that coopetition studies have mainly been concentrated in developed countries that have long tradition of stable contract laws and strong legal structures, with the assumption that the institutional structures in those countries allow the market to responsibly regulate firms' behaviours (Gray, 1997). However, SMEs in developing economies such as Africa, operate in a different institutional context and face unique institutional challenges such as under-developed legal structures, communication infrastructure and market intermediaries as well as widespread collectivist social setting (Gray, 1997; Salami, 2011). To the best of the researcher's knowledge, this study not only represents the first attempt to examine

institutional environmental factor as a driver and boundary condition of coopetition capability in the coopetition literature but also is one of the few studies to incorporate the institutional environment in the dynamic capabilities and interfirm relationships literatures.

Furthermore, the study sheds light on whether investing in coopetition capability has any value for firms. To this effect, the study investigates the links between coopetition capability and coopetition performance on one hand, and the proposed boundary conditions of institutional support and coopetition learning process on the other hand. Results provide rare and intriguing insights on a capability not comprehensively examined in the coopetition literature. This provides understanding and extends knowledge on how and when firms can manipulate coopetition capability and leverage its benefits.

By conceptualising and empirically testing the drivers, performance outcomes and boundary conditions of coopetition capability as a dynamic capability, this study departs from prior strategy research which has focused primarily on theorising, but not empirically demonstrating the dynamic capability antecedents-contingencies-performance link. The few extant empirical studies to investigate both drivers and outcomes of dynamic capability have not only focused on a limited set of components but have also excluded the boundary conditions. The inclusion of contingencies in this study's model is a timely response to Barreto (2010) and Schilke (2014a) appeals for more comprehensive dynamic capability empirical research that includes contingencies to the performance outcomes of dynamic capability.

At a practical level, the study makes a contribution in the form of policy and managerial implications. The study provides SMEs with implementable insights regarding coopetition. Considering the fact that coopetition can be both value enhancing and value damaging, managers are provided with information on how and when they can manipulate coopetition capability and leverage its benefits. The study also furnishes government institutions insights on the performance outcomes of coopetition capability that will be useful in the formulation of policies that support and promote effective coopetition management to boost performance in SMEs.

Traditionally, studies on coopetition have focused on large firms to the neglect of coopetition in SMEs (Gnyawali and Park, 2009). Yet, coopetition strategy could be of greater importance in SMEs not only because of the firm specific challenges these firms face but also because these ventures are more vulnerable to environmental forces compared to their large-sized counterparts (Morris et al., 2007). As such, this study makes a contextual contribution by examining the coopetition phenomenon in SMEs.

Last but not least, while coopetition has been relatively more researched in developed countries, not much has been done on the subject in developing countries. Therefore, this study extends the frontiers of strategy and coopetition literatures to a context previously unexamined, a developing African economy. By testing the conceptual model on Zambian-based SMEs, the study provides evidence of the applicability of not only the coopetition capability phenomenon but also Western developed and validated measures beyond the developed economy context and is a timely response to appeals (e.g., Hoskisson et al., 2000; Wright et al., 2005; Xu and Meyer, 2013) to strategy researchers to embrace developments in such regional settings to advance the development of theory and practice.

1.7 Author motivations

World over, SMEs are recognised as one of the necessary recipes for economic growth and prosperity (Beyene, 2002). There is evidence that SMEs are an important source of employment creation, provide people with a variety of products and services, intensify competition, increase productivity and positively impact individual lives on multiple levels (Amoros and Bosma, 2014; Kauffmann, 2005; Nolan, 2003). In both developed and developing economies, SMEs are credited for the growth of national economies as they account for the greatest number of employment growth, and therefore are viewed as an important tool for national economic growth (Kauffmann, 2005). In Zambia, in particular, SMEs represent 80% of the private sector and are viewed as one of the sustainable ways of reducing the country's dependence on natural resources such as copper, and of improving the quality of life of households in wealth and job creation (Conway and Shah, 2010). Recognising the critical role of SMEs in economic development, Zambia has run a myriad of SME development and support programmes aimed at enhancing their performance.

Unfortunately, the majority of SMEs in developing economies are weak and stay small due to lack of resources and difficult business conditions (Beyene, 2002; World Bank, 2013). As a result, SMEs in these economies contribute less than 20% to Gross Domestic Product (GDP) yet, the figure can reach up to 60% in high-income countries (Tadesse, 2009). Taking the case of Zambia, SMEs face a plethora of challenges that inhibit their growth and competitiveness. As such, though accounting for the majority of the private sector, SMEs contribute less to GDP(Chibwe, 2008). One of the major challenges SMEs face in Zambia is lack of appropriate resources and capabilities needed for their growth and survival (AfDB, 2010). The lack of resources and

capabilities puts SMEs in Zambia in particular jeopardy with the increasing globalisation and rapid technological change. For the Zambian economy to be competitive in the future, SMEs need to adjust successfully to the new market conditions and competitive situations.

The author views coopetition as a viable strategy for pooling resources and responding to the new competitive conditions and boosting performance of SMEs in Zambia. The author believes that ultimately, successful coopetition should boost economic growth and employment levels. Therefore, motivated by the aim to help improve the competitiveness and performance of SMEs in developing economies in general and in Zambia in particular, this study examines the coopetition phenomenon in SMEs, focusing on how SMEs develop and benefit from management mechanisms of coopetitive relationships.

1.8 Thesis outline

To achieve the stated research objectives and to attend to the other issues discussed in the foregoing sections, this thesis is divided into eight (8) chapters that explain the various aspects of the overall research process and that together make the study complete. Table 1.1 displays an outline of the chapters.

Table 1.1: Outline of thesis chapters

Chapter	Chapter thematic focus
Chapter 1	General introduction to the research, gaps in the literature, research objectives and contributions
Chapter 2	Review and synthesis of coopetition and interfirm relationship literatures
Chapter 3	Theoretical underpinnings guiding the study, conceptualisation of coopetition capability, conceptual model and hypotheses arguments
Chapter 4	Philosophical foundations of the research and methodological processes
Chapter 5	Data examination and descriptive analysis
Chapter 6	Measurement scale development and assessment
Chapter 7	Results
Chapter 8	Discussion of the results, implications, conclusions and study limitations

1.9 Chapter summary

This chapter has presented a general introduction to the study including issues motivating the study as well as gaps in the literature relevant to the study reported in this thesis. In summary, though coopetition appears to be a viable strategy for growth and survival in today's dynamic and competitive business world, it is challenging, with scholarship suggesting positive and negative outcomes. To this effect, the literature points to the importance of investing in interfirm relationship management routines and mechanisms. However, empirical studies focusing on the drivers, boundary conditions and performance outcomes of such mechanisms in SMEs are rare in the literature. Besides, the few extant empirical studies on interfirm relationship management to investigate the antecedents have focused on a limited set of components. Consequently, this study aims to extend previous scholarly works on the interfirm relationship literature in general and the coopetition literature in particular, focusing on understanding the conceptual domain, drivers, boundary conditions and performance outcomes of coopetition capability. The next chapter is therefore devoted to a review of the relevant extant literature on coopetition phenomenon.

Chapter 2 : Literature review

2.1 Introduction

This chapter presents an overview of the relevant extant literature on coopetition and the general interfirm relationship management capability. The review starts with a background on the coopetition concept. This is followed by a review on coopetition in SMEs, the focus of the study. Furthermore, the chapter gives a general review of the interfirm relationship management capability as applied within the strategic alliance scholarship. In so doing, a case for gaps in the interfirm relationship management capability literature in general and the coopetition literature in particular, which merits the study, is established.

2.2 The concept of coopetition

Extant scholarly research on organizational behaviour has broadly considered the existence of competition and cooperation as independent and oppositional (Barney, 2001a; Chen, 2008; Porter, 1980), and often, one relationship is argued to harm the other. The competitive perspective assumes that firms have divergent interests which prompt them to pursue self-interest oriented behaviours. As such, the competitive orientation rests on the win/lose perspective where, for one party to win, the other party must lose. On the other hand, cooperation emphasizes collaboration with other organizations, rather than competition. The cooperative perspective thus assumes that a firm's performance can be enhanced by pooling together complementary resources and capabilities with other firms (John and David, 1998).

However, researchers in the past two decades have argued against the conventional view of competition and cooperation as independent and oppositional (e.g.,

Brandenburger and Nalebuff, 1996; Bengtsson and Kock, 1999; Gnyawali and Madhavan, 2001), with the contention that competition and cooperation may occur simultaneously. It is argued that the traditional notion of competition and cooperation being oppositional ignores the fact that even though competitors may not have a mutual interest to interact with each other, their relationships can also be characterized by mutuality and understanding (Bengtsson and Kock, 1999). On that basis, a third perspective about interfirm interdependences—coopetition—has been introduced to the strategy lexicon, premised on the idea that competing firms may cooperate with each other to create mutual and individual values. Defined as the simultaneous pursuit of cooperation and competition (Raza-Ullah et al., 2014), coopetition is framed as a synthesis between the competitive and the cooperative views, and is viewed as an integrative framework (Padula and Dagnino, 2007) that provides a more realistic and accurate picture of interfirm interdependences.

Although the coopetition concept only became familiar to mainstream business research much later, in 1996 through a study by Brandenburger and Nalebuff, the term coopetition was coined among practitioners as far back as 1911. For example, Kirk S. Pickett of the Oyster manufacturer, Sealshipt, used the term in 1911 to convey the understanding of how Sealshipt dealers were to act towards one another. He directed the dealers that,

"*You are only one of several dealers selling our oysters in your city. But you are not in competition with one another. You are cooperating with one another to develop more business for each of you. You are in 'coopetition', not in competition. What competition there is, is of the kind that you all can fight to common advantage*" (Cherington, 1913:144).

Hunt (1937) also used the term when he called for the unification of competition and cooperation. However, no public attention was received from these early introductions of coopetition. It was not until 1992 when Raymond Noorda, founder of Novell, reintroduced and employed coopetition as a business strategy that Brandenburger and Nalebuff (1996) adopted the term and made it the title of their book.

2.3 Coopetition and related concepts

Given its paradoxical nature of simultaneous cooperation and competition, coopetition is usually perceived as either another form of collusion or another form of strategic alliances. However, the three are not the same.

While both collusion and coopetition involve cooperation with rivals, competing firms in collusion collaborate to fulfil narrow 'selfish' gains such as increasing the partners' surplus through rises in price and power in monopoly (Rusko, 2011). This in turn leads to a decrease in total surplus or social welfare as only the two firms benefit at the expense of consumers. On the other hand, the benefits of coopetition not only spread to the cooperating partners but also to consumers (Peng et al., 2012; Ritala, 2012; Ritala et al., 2014). For example, Peng et al. (2012) found that coopetition did not only permit the attainment of performance levels for coopeting firms but also that it was beneficial to consumers through lowering costs and improving the value of the market offerings. This suggests that coopetition produces a win-win situation between cooperating partners as well as consumers as Luo puts it, "the coopetitive behaviour seeks the positive-sum, efficiency enhancing effects of competition and cooperation" (2007: 131). On the other hand, collusive moves are usually accused of violating legislation governing competition as they mostly relate to price fixing (Wu, 2014), thus cannot fit into the coopetitive framework.

A strategic alliance is another field in which coopetition has been partially examined. For example, Bengtsson and Johansson (2014) used alliance portfolio lens to examine SME coopetitive relationships. Nevertheless, an insightful and interesting distinction can be drawn between the two concepts. While strategic alliances are cooperative agreements, mostly formal, based on a written contract which stipulates the nature of the cooperation, outcomes, duration and controlling ownership, among other things (Zeng and Chen, 2003), coopetition includes both formal and informal cooperation with competitors (Bengtsson and Kock, 2000). Jorde and Teece (1990) define alliances as "bilateral or multilateral relationships characterised by the commitment of two or more partner firms to a common goal" (p.85), suggesting that strategic alliances are nearer to cooperation than competition. In fact, Bengtsson and Kock (2000) makes it clearer that, "Rivalry and conflict are seen as a threat because they can hamper the performance of a strategic alliance" (p. 414). In short, while coopetition emphasises on the coexistence of cooperation and competition, a strategic alliance emphasises on the existence of cooperation only.

Although the above distinctions, if a strategic alliance involves competitive moves, it can be said to be coopetitive and in the same way, a collusion where firms compete in at least one activity is coopetitive (Rusko, 2011).

2.4 Consequences of coopetition

An early discussion on coopetition-performance relationship is provided by Bengtsson and Kock (2000). Through an explorative qualitative study of two Swedish and one Finish industries, they argue and demonstrate that lower costs of developing new products, competence, market knowledge and shorter lead times are some of the gains from coopetitive relationships. However, a company may lose competitive advantage

of using unique resources in activities close to the buyers (Bengtsson and Kock, 2000). Along the same vein, Luo's (2007) study aimed at providing a framework to analyse the rationality, behaviour, evolution, and tactics of coopetition for MNEs in global competition posit that coopetition helps competitors enhance their internal skills and technologies while guarding against transferring competitive advantages to ambitious partners. He claims that through competitive collaboration, firms are able to internalise a partner's skills, reduce costs, risks and uncertainties. This suggests that while Luo (2007) and Bengtsson and Kock (2000) argue for positive effects of coopetition, they also acknowledge the risks, such as transferring competitive advantage to ambitious partners, associated with coopetitive relationships.

Gnyawali and Park (2011) submit that coopetition is a challenging relationship characterised by high levels of tension and a competitor risks losing knowledge to a competitor-partner. This may turn a weak competitor-partner into a strong competitor. Nevertheless, their in-depth case study aimed at investigating why and how coopetition between large firms occurs, concedes that coopetition is very helpful for firms to address major technological challenges, to create benefits for partnering firms, and to advance technological innovation (Gnyawali and Park, 2011).

Meanwhile, Rusko's findings from a case study of the Finnish forest industry aimed at examining the usefulness of coopetition to studying the sustainability of an industry indicate that coopetition is one of the crucial factors accounting for the success and sustainability of the industry (2011). However, in other contexts, Oum et al. (2004) found that while coopetition had a positive impact on firm productivity, it had no impact on profitability.

Recognising previous scholars' ambivalence on the effects of coopetition, Ritala (2012) empirically examined the moderating effects of market uncertainty, network externalities and competitive intensity on the coopetition-innovation and coopetition-market performance relationships. Results from a cross sectional survey of 209 Finnish firms show that while the coopetition strategy is beneficial under high market uncertainty and high network externalities, surprisingly the strategy is not beneficial under high competition intensity when Peng and Bourne (2009) in another context found the strategy beneficial under high competition.

Bouncken and Kraus (2013) are more straightforward in as far as the ambivalence of the effects of coopetition is concerned as can be seen in their title "the double-edged sword of coopetition" (p.205). Unlike Ritala (2012), their study examined knowledge sharing, in-learning and technological uncertainty as moderators influencing coopetition-innovation performance relationship. Their results from a sample of 830 SMEs as well as from qualitative validation interviews show that coopetition has a varying impact on innovation as it can trigger radical innovation, but harm revolutionary innovation. However, since the focus of their study was on innovation performance, they did not look at other firm performance measures.

Wu (2014) also examined the dynamics of cooperation between competing firms in R&D activities, which he calls R&D coopetition, with the innovating firm's technological capability and its alliances with universities as moderators. Data from 1499 Chinese firms support his hypothesis that there exists a bell-shaped relationship between coopetition and product innovation performance. However, the moderators were shown to weaken the relationship.

Taken together, these studies suggest that coopetition is both beneficial and costly. The benefits include pooling of expertise and resources to create synergy, to enlarge economies of scale, to develop and deliver better products and services by learning and working together. However, coopetition may be risky and costly as the coopetitive relationship is usually characterised with high levels of tension and opportunistic exploitation. A firm may also lose its competitive advantage to a weaker competitor. Although the studies provide this variation in the consequences of coopetition, there is a paucity of studies that systematically investigate the conditions under which coopetition is beneficial and costly and those that have, have largely focussed on innovation performance. There is therefore need for further research to address this deficiency in literature in as far as coopetition-firm performance relationship is concerned.

Furthermore, a careful review of the literature indicates that the majority of the studies on coopetition have been qualitative, with few studies empirically examining coopetition using large samples. Gnyawali and Park (2009) acknowledge this gap and attribute the lack of large sample studies and statistical analysis to the nonexistence of appropriate and well-developed coopetition measures. Strictly speaking, there is consistency in terms of direction for further research, with most of the previous studies calling for holistic empirical investigation on the antecedents, moderating factors, and consequences of coopetition (e.g., Bengtsson and Kock, 2000; Gnyawali and Park, 2009; Peng and Bourne, 2009; Ritala, 2012; Fernandez et al., 2014).

2.5 Coopetition in small and medium-sized enterprises

SMEs are typically small in nature and as such, they are not endowed with significant internal resources for market exploitation. This puts them in particular jeopardy

especially with the increasing globalisation and rapid technological change. Actually, research suggests SMEs face numerous challenges. For example, Morris et al. (2007) submits that SMEs are more vulnerable to market uncertainty compared to their medium and large sized counterparts. Levy et al. (2003) also submits that because SMEs tend to have small market shares, narrow product lines, and a niche customer base, it is difficult for them to influence not only price but also business operations as a whole. More recently, Bengtsson and Johansson (2014) have pointed that small firms are challenged by the need for external resources due to their difficulty with obtaining capital and patents.

With the challenges SMEs face, scholars have suggested that coopetition plays a key role in the strategy and performance of SMEs. Gomes-Casseres (1997) in Gnyawali and Park (2009) illustrates how Mips Computer Systems, a small firm was able to compete against IBM and Hewlett-Packard, well-established players, by collaborating with several small semiconductor firms. Tomlinson and Fai (2013) highlight that SMEs need to collaborate with other firms, even larger ones, which own relevant resources which are often not available for purchase in factor markets. This will allow SMEs to gain access to assets that create value, thereby overcoming the resource deficiency constraint. Levy et al. (2003) submit that "SMEs' tendency to engage in coopetition is likely to positively relate to financial performance" (p.4).

However, while this literature indicates that SMEs may benefit from coopetition, other scholars suggest that coopetition may also be risky for SMEs. For example, Gnyawali and Park (2009), using the resource based view, game theory and network theory developed a multilevel conceptual model consisting of factors at the industry, dyadic, and firm level to understand the drivers of coopetition and discuss benefits and costs of

coopetition for SMEs. According to them, economies of scale, reduction of uncertainty and risk and speed of product development are the benefits attributable to coopetition while technological risks, management challenge and loss of control are the costs. However, their conceptual model was not empirically tested to validate their propositions.

After highlighting the benefits of coopetition in SMEs such as access to intrinsic assets, Tomlinson and Fai (2013) also note that coopetition comes with risks such as technology leakage to rivals and loss of control over the innovation process. However, their study, with data obtained from 371 SMEs, found that cooperation with rivals did not have significant impact on innovation. Bouncken and Kraus (2013) with a sample of 830 SMEs also examined the coopetition-innovation performance relationship and found that coopetition can trigger radical innovation, but at the same time harm revolutionary innovation.

To summarise, the literature review indicates that though the importance of coopetition as a strategy for SMEs has been recognised, studies on coopetition have largely focused on large firms to the neglect of coopetition in SMEs. In addition, while a relatively large body of previous research theoretically asserts a positive relationship between coopetition and SME firm performance, fewer empirical studies demonstrate it using multiple and varied firm performance. As Gnyawali and Park (2009:324) submit "Given the novelty of the construct, appropriate and well-developed measures do not exist to perform large sample studies and conduct statistical analyses of coopetition"
Overall, while the majority of coopetition studies suggest the importance of coopetition in SMEs considering the resource constraints and market challenges that SMEs face in this global business environment, there appears no conclusive evidence in literature in

terms of the effects of coopetition on firm performance, suggesting positive effects (e.g., Morris et al., 2007; Rusko, 2011; Ritala, 2012), negative effects (e.g., Park and Russo, 1996), both positive and negative effects (e.g., Luo, 2007; Bouncken and Kraus, 2013; Wu, 2014) and no impact (e.g., Oum et al., 2004; Tomlinson and Fai, 2013). Table 2.1 exhibits a summary of selected studies on coopetition

Table 2.1: Summary of selected studies on coopetition

Authors	Objective of the study	Methodology/firm size /country	Theory	Antecedent variables	Outcome variables of coopetition	Moderators	Key findings
Bengtsson and Kock (1999)	To investigate cooperation and competition in relationships between competitors	Qualitative Large. Sweden.	Network theory, alliances	Cooperation, competition	----	---	A firm can be involved in four different types of horizontal relationships at the same time. Apart from relationships consisting of competition or cooperation, a firm can live in symbiosis by coexisting with other relationships, or being involved in a relationship simultaneously containing elements of both cooperation and competition.
Bengtsson & Kock (2000)	To explore how the division between the cooperative and the competitive part of the relationship can be made and to scrutinise the advantages of coopetition.	Qualitative. Sweden and Finland	----	Efficiency in resource utilisation, need for external resources, closeness of an activity to the customer, competitors' positions and connectedness between them	Time, competence, market knowledge, reputation and other resources of importance for its business. But, competitive advantage of using unique resources in activities close to the buyer is lost	----	Firms tend to more frequently cooperate in activities carried out at a greater distance from buyers and compete in activities closer to buyer.
Tsai (2002)	To investigate the effectiveness of coordination mechanisms on knowledge sharing in interorganisational networks of coopetition	Quantitative. Large multiunit company	Social network	Centralisation and social interaction.	Knowledge sharing	Inter-unit competition	centralisation has a negative effect on knowledge sharing and social interaction has a positive effect on knowledge sharing among units that compete with each other for market share but not among units that compete with each other for internal resources
Levy et al. (2003)	To investigate knowledge sharing and SMEs' attitude to the use of IS	Qualitative. SMEs, UK	Game theory	Knowledge sharing	Information system	----	A game–theoretic framework for analysing interorganisational knowledge sharing under co-opetition and guidelines for the management of explicit knowledge predicated on coordination and control theory has been proposed.
Oum et al. (2004)	To investigate the effect of horizontal alliances on firm performance.	Quantitative. World' top 30 international airlines	Resource dependence theory, transaction cost.	Number of alliances	Firm productivity and profitability	Level of cooperation	Positive impact on firm productivity, but no impact on profitability. Level of cooperation positively influences firm productivity and profitability.

Table 2.1: Summary of selected studies on coopetition (continued)

Authors	Objective of the study	Methodology/firm size /country	Theory	Antecedent variables	Outcome variables of coopetition	Moderators	Key findings
Gnyawali et al. (2006)	To examine how coopetition affects firms' competitive behaviour.	Quantitative. global steel producers	Network structure, competitive dynamics	Network centrality, structural autonomy.	Competitive activity, competitive variety	Market diversity	A firm's centrality is positively related to its volume of competitive actions and that its structural autonomy is positively related to the diversity of such actions. Market diversity moderates the impact of centrality and structural autonomy on competitive behaviour.
Luo et al. (2006)	To investigate the effects of cross-functional coopetition	Quantitative. China	Social embeddedness	Cross functional coopetition, learning mechanism	Learning mechanism, Customer and financial performance	----	Cross-functional coopetition enhances a firm's customer and financial performance. Performance returns to cross-functional coopetition occurs through an underlying learning mechanism
Morris et al. (2007)	To explore the coopetition in a small business context – nature of coopetition and factors that affect a firm's tendency to cooperate with a direct competitor.	Quantitative. SMEs. Turkey.	----	Mutual benefit, trust and commitment	Business performance	----	Proposes an approach to measuring the coopetitive tendencies of small firms, centered on three underlying dimensions: mutual benefit, trust, and commitment. A strong and positive relationship between coopetition and performance is identified.
Luo (2007)	To provide a framework to analyse the rationality, behaviour, evolution, and tactics of coopetition for MNEs in global competition.	Qualitative. MNEs	Competitive dynamic	Increasing interdependence between global partners and the heightened need for collective action. Risk sharing, Strategic flexibility	Efficiency enhancing internalise a partnering rival's skills. reduced costs, risks and uncertainties associated with innovation.	----	Several broad guidelines for building coopetition relationships.
Mariani (2007)	Top analyse the formation of coopetition as an unintended and therefore emergent strategy.	Qualitative: case study. ---- Italy	Institutional theory	Institutional environment	Improved performance	----	Identifies specific strategic learning processes that intervene in the formation of cooperation, and introduces two related new concepts of imposed cooperation and induced coopetition.
Walley (2007)	To present a research agenda for researchers interested in coopetition.	Qualitative: Literature review	----	----	----	----	An agenda for research in the field of coopetition: typologies and models of coopetition; coopetition and firm performance; coopetition within an economy; resources, capabilities, and competencies underpinning coopetition; application of coopetitive strategy; managerial perceptions of coopetition; internal coopetition; coopetition and consumers.

Table 2.1: Summary of selected studies on coopetition (continued)

Authors	Objective of the study	Methodology/firm size /country	Theory	Antecedent variables	Outcome variables of coopetition	Moderators	Key findings
Padula and Dagnino (2007)	To propose the notion of cooperation as a truly coopetitive game and develop propositions on the rise of coopetition.	Qualitative	Game theory	Environment-related and firm-related factors	intrusion of competitive issues within a cooperative game structure	----	Developed a series of propositions linking the rise of coopetition to a set of, respectively, environment-related and firm-related factors in order to explain the drivers of the intrusion of competitive issues within a cooperative game structure.
Chin et al. (2008)	To examine success factors critical to coopetition strategy management.	Qualitative: Literature review and expert interviews manufacturing sector. Hong Kong	----	Management commitment, relationship development, communication management.	Successful coopetition	----	The results show that management leadership and development of trust are the most important success factors
Gnyawali and Park (2009)	To develop a conceptual framework that helps to understand factors influencing coopetition strategies	Qualitative. SMEs, US	Resource based view, game theory, and network theory	Industry level, firm level, dyadic factors:	**Benefits**: economies of scale, reduction of uncertainty and risk, speed in product development. **Costs**: technological risks, management challenge, loss of control.	----	Developed a multilevel conceptual model consisting of factors at the industry, dyadic, and firm level to understand the drivers of coopetition and discuss benefits and costs of coopetition for SMEs.
Peng and Bourne (2009)	To address the coexistence of competition and cooperation between networks, and to depict how networks with different structures interact with each other.	Qualitative: case study of two healthcare networks. Taiwan	Resource Based View and intensive competition and strategic positioning perspectives. Network structure.	Homogeneity and heterogeneity in resources. Intensive competition	----	----	Two organisations will compete and cooperate simultaneously when each organisation has complementary but distinctly different sets of resources and when the field of competition is distinctly separate from the field of coopetition. Two networks will find it easier to balance competition and cooperation when each network has compatible but distinctly different structures.
Bengtsson et al. (2010)	To conceptually develop the understanding of coopetition dynamics and to enhance the conceptual clarity of coopetition.	Qualitative	Game theory	Value creation, and value utilisation: firms create value by sharing knowledge and resources through cooperation, but are forced by competition to utilise outcomes	Achieve growth over time and remain competitive. But, may lead to collusive behaviour and prominent dysfunctions	----	Conceptual, outlines how different types of coopetitive interactions result in archetypical situations where the dynamics of coopetition are present as well as where the dynamics of coopetition are missing due to a lack of balance between cooperation and competition.

Table 2.1: Summary of selected studies on coopetition (continued)

Authors	Objective of the study	Methodology/firm size /country	Theory	Antecedent variables	Outcome variables of coopetition	Moderators	Key findings
Rusko (2011)	To discuss the usefulness of the concept of coopetition to studying the sustainability of an industry.	Case study, linear-analytic structure. Finland	Game theory	Create greater value or benefit, that is, to improve the performance of the firms. To create bigger business pie, while competing to divide it up.	Coopetition as one of the crucial factors contributing to the success of the Finnish forest industry.	----	It is not only strong domestic competition, but also, and especially, coopetition traditions that are the crucial factors contributing to the success of the industry. Coopetition traditions have been present throughout the activities of the Finnish industry, enabling sustainability of the industry to a significant extent.
Gnyawali and Park (2011)	To investigate why and how coopetition between large firms occurs, evolves, and impacts the participating firms and the industry.	Qualitative: in-depth case study. Large firms, US	Resource based view, dynamic capability	Industry and technological challenges and opportunities. Superior and relevant partners' resources and capabilities. Firm strategies and aspirations.	Partners' value creation and appropriation. Industry technological development and standards. Industry competitive dynamics. But, challenging: higher levels of tension, risk loss of knowledge to a competitor-partner. May turn a weak competitor-partner into a strong competitor	Coopetition capability	Coopetition is challenging yet very helpful for firms to address major technological challenges, to create benefits for partnering firms, and to advance technological innovation. Coopetition among giants cause subsequent co-opetition among other firms and results in advanced technological development. Coopetition capabilities enhance common benefits as well as in gaining proportionately large share.
Peng et al. (2012)	To provide a scrutinised review of previous research on coopetition so as to clarify the research stream on coopetition.	Qualitative: in-depth case study over a 15-year period. Taiwan	Competitive dynamics	Summarises literature on antecedents into: resource similarity and market commonality	Key benefits: pooling of expertise and resources to create synergy, to enlarge the economies of scale, to reduce cost and risk, to develop products and deliver better services by learning and working together. **Fail** when difficult to develop trust-based relationship and to share resources.	----	Cooperation with competitors did lead to better performance, at least over a period, in two ways: a. the adoption of coopetition permitted the attainment of performance levels beyond what would otherwise have been possible; b. the adoption of coopetition changed the timeframe, permitting earlier achievement of higher performance levels.
Ritala (2012)	To examine the distinctive contingency factors that matter for a coopetition strategy.	Quantitative. Finland	Game theory and Resource Based View	Coopetition alignment.	Innovation and market performance	Market uncertainty, network externalities.	Coopetition strategy is beneficial under high market uncertainty, when market uncertainty is low, a coopetition strategy does not provide any added value. Coopetition is beneficial to both innovation and market performance under high network externalities
Bouncken and Fredrich (2012)	To examine the performance implications and management antecedents of coopetition.	Quantitative. German	Alliance	Antecedents: alliance strategy, and alliance function. Coopetition.	Competitive success, radical innovation and incremental innovation.	Trust and dependency	Coopetition strongly improves radical innovation. Incremental innovations are only achieved in environments of high trust and high dependency. Coopetition can increase the competitive success of firms significantly only under high trust and high dependency.

Table 2.1: Summary of selected studies on coopetition (continued)

Authors	Objective of the study	Methodology/firm size /country	Theory	Antecedent variables	Outcome variables of coopetition	Moderators	Key findings
Ritala and Hurmelinna-Lukkanen (2012)	To examine why some firms are better able than others to reap benefits from coopetition in innovation.	Quantitative. Large, Finland	----	Absorptive capacity and appropriability	Incremental and radical innovation	Appropriability	Absorptive capacity and appropriability regime both have a positive effect in the pursuit of incremental innovations in coopetition, For radical innovations, appropriability regime has a positive effect, while the effect of absorptive capacity is not statistically significant. Absorptive capacity is positively associated with creation of radical innovations within high levels of appropriability regime.
Bouncken and Kraus (2013)	To provide insight into the effect of coopetition on revolutionary and radical innovation.	Mixed method: quantitative and qualitative interviews validation. SMEs, German	----	Coopetition	Radical innovation; revolutionary innovation	knowledge sharing, learning from partners, and technological uncertainty	Coopetition has a varying impact on innovations of SMEs. Coopetition can trigger radical innovation, but at the same time can harm the extremely novel revolutionary innovation. Three moderators influence coopetition's innovation performance.
Fernandez et al. (2014)	To address critical gap in literature on: a. what are the sources of tension in coopetition? B. How do firms manage tension in their coopetitive relationships?	Qualitative: literature review and in-depth study. ---- Europe	----	Sources of tension at inter-organisational, intra-organisational and inter-individual levels	Common project, coopetition	----	High tension could turn a common project into failure. At the same time, co-opetition could lead to beneficial outcomes is because simultaneity of the elements of both competition and cooperation
Dahl (2014)	To develop a framework that explains change in coopetitive interactions over time.	Qualitative. ---- ----	----	Inter-organisational learning, intra-organisational learning, and the development of the external environment.	Coopetitive interaction.	----	Conceptual, developed a framework that distinguishes three mechanisms underlying change
Park et al. (2014)	To investigate the extent to which coopetition impacts innovation performance	Quantitative. Large, US	----	intensity of competition and intensity of cooperation	Innovation performance	----	Competition and cooperation intensities have non-monotonic positive relationship with firm's coopetition-based innovation performance. Balance coopetition has a positive effect on innovation performance.
Ritala et al. (2014)	To focus on the ways in which the potential advantages of coopetition can be realised by involving competitors in the firm's business model.	Longitudinal qualitative single in-depth case study, and secondary data. ---- ----	----	Coopetition	Market growth, resource efficiency, and increased competitiveness	----	The results provide evidence of how Amazon.com has utilised coopetition-based business models in three particular phases. This has led to market growth, resource efficiency, and increased competitiveness not only for Amazon.com but also for its coopetitive network of third-party sellers, content providers, and large multi-national competitors.

Table 2.1: Summary of selected studies on coopetition (continued

Authors	Objective of the study	Methodology/firm size /country	Theory	Antecedent variables	Outcome variables of coopetition	Moderators	Key findings
Raza-Ullah et al. (2014)	To explore the nature of the paradox inherent in coopetition.	Qualitative. ---- ----	----	Coopetition context: Industrial factors, relational factors and firm-specific factors.	Tension in coopetition: emotional ambivalence at interorganisational and organisational levels	----	Tension comprises both positive and negative emotions simultaneously, also known as emotional ambivalence. Emotional ambivalence in coopetition prevails at different levels, and vary in its level of intensity and persistency in relation to different contexts.
Tomlinson and Fai (2013)	To develop measures; to explore the relationships between innovation and types of cooperation along the vertical supply chain and horizontally with competitor firms.	Quantitative. SMEs UK	----	Buyer cooperation, supplier cooperation and horizontal cooperation.	Innovative capability.	----	The strength of cooperative ties across a range of productive activities within the value chain are important facilitators for SME innovative capability (both product and process innovation). SME cooperation with rivals (coopetition) has no significant impact upon innovation.
Wu (2014)	To examine the dynamics of cooperation between competing firms in their R&D activities (R&D coopetition).	Quantitative. ---- China	----	Coopetition	Product innovation performance	Technological capability, alliances with universities	The results support the existence of a bell-shaped relationship between coopetition and product innovation. Technological capability and alliances with universities (moderating roles) were shown to weaken the relationship.
Bengtsson and Johansson (2014).	To explore managerial challenges that SMEs face when collaborating with large, powerful competitors, and to examine how they balance the relationship to create and sustain business opportunities through coopetition.	Three exploratory case studies. SMEs Sweden	Strategic alliance perspective.	Technological convergence, market convergence and temporality in relationships. Need for external resources.	Create value and strengthens SMEs' competence. But,tension due to size (smallness) and bureaucratic big organisations. Challenges for SMEs in coopetition with big firms: a. how to manage the liabilities of smallness and newness, and b. how to sustain independence in and balance coopetitive relationships.	----	Developed a theoretical model suggesting that SMEs can manage the liabilities of smallness and newness, and sustain independence in and balance coopetitive relationships with large firms if they develop alliance portfolio managing capabilities. The ability to build legitimacy, enhance agility and create role flexibility plays an important role in balancing and navigating among different coopetitive relationships, thereby creating sustaining opportunities.
Tidstrom, (2014).	To investigate how tensions are managed in coopetitive relationships and examine the potential outcomes of the management of such tensions.	Qualitative: Longitudinal comparative case study approach. SMEs Finland	----	Management of tension.	Benefits of coopetition: achieving growth over time, and remaining competitive. But, can be difficult to sustain and balance due to tensions	----	Most tensions are managed by using styles of competition and avoidance and result in mixed outcomes, which implies both positive and negative perception.

Table 2.1: Summary of selected studies on coopetition (continued)

Authors	Objective of the study	Methodology/firm size /country	Theory	Antecedent variables	Outcome variables of coopetition	Moderators	Key findings
Huang and Chu (2015)	To examine the antecedents and consequences of coopetitive strategies in SME accounting agencies.	Quantitative SMEs. Taiwan	----	Expertise heterogeneity, expertise complementarity, competitive action, joint action	Performance Competition strategy, cooperation sttrategy	Trust	Results suggest that expertise heterogeneity positively affects competition strategy, and expertise complementarity positively affects the cooperation strategy.
Bouncken et al. (2015)	To present a systematic literature review on coopetition research.	systematic, evidence informed literature review. ---- ----	-----	----	----	----	Develop a new definition of coopetition and highlight several promising areas for future research, such as the elaboration of theoretical and empirical approaches, the consideration of contextual contingencies, and implications for innovation that involves interorganisational knowledge flow.
Gnyawali et al. (2016)	To develop a framework of paradoxical conditions, paradoxical tension, and performance implications of tension in such relationships.	Qualitative. ---- ----	----	Paradoxical situations: dualities and contradictions	Tension: strain, conflict	Coopetition management	Conceptual, developed a framework for coopetitive tension and performance implications.
Bengtsson et al. (2016)	To investigate the effects of coopetition paradox on managers' experience and perception of coopetitive tensions	Quantitative. ---- Sweden	Paradox perspective	Coopetition paradox	Internal tension, external tension	Coopetition capability	Coopetition capability enables firms to maintain a moderate level of tension regardless of the intensity of coopetition paradox
Fernandez and Chiambaretto (2016)	To provide insights into the management of tensions related to information in coopetition.	Qualitative. ---- ----	----	Tension related to information, formal and informal controls	----	----	Findings suggest that the management of tensions related to information in coopetitive projects requires a combination of formal control mechanisms (to manage information criticality) and informal control mechanisms (to manage information appropriability).
Bouncken et al. (2017)	To investigate the benefits and risks of NPD coopetition on innovation	Quantitative. Large, German	----	New product development alliances pre-launch and launch phases	Radical and incremental innovation	----	Coopetition is advantageous for incremental innovation in both pre-launch and launch phases but good for radical innovation in the launch phase only.

2.6 Management of coopetitive relationships

Given that coopetition comes with both benefits and costs, the literature points to the need for firms to develop coopetition management capabilities and competences to maximize the benefits of coopetition and to contain its costs. In fact, recent coopetition studies have drawn attention to a firm's coopetition management mechanisms that may facilitate successful coopetitive relationships (Gnyawali and Park, 2011; Bengtsson and Johansson, 2014; Raza-Ullah et al., 2014; Tidström, 2014; Fernandez et al., 2014). For example, Bengtsson and Johansson's (2014) study demonstrates that SMEs need to develop alliance portfolio management capabilities to survive in coopetitive relationships with large firms. Gnyawali and Park (2011) rely on evidence from few cases of firms to suggest that coopetition capability development is necessary for an effective management of coopetitive relationships. According to them coopetition capability is a firm's ability to effectively manage coopetitive relationships. More recently, Gnyawali et al. (2016) have proposed that management capabilities moderate the relationship between coopetition strategy and performance. Also, Bengtsson et al. (2016) provide evidence that coopetition capability moderates external tensions and reduces internal tensions in coopetitive relationships.

While these extant works are commendable, the existing literature is still inconclusive with respect to how SMEs develop and benefit from coopetition capability. In addition, the literature is silent particularly on the processes that SMEs undergo to manage their relationships with competitors. Thus, although the overall importance of managing interfirm relationships has been recognized in the broad interfirm cooperation literature, much of extant studies have focused mainly on large organizations. The few that have examined coopetition in SMEs (e.g., Bouncken and Kraus, 2013; Gnyawali and Park,

2009) are silent on how coopetition capability is defined, how it emerges in SMEs, how it is related to SMEs' performance and the key contingencies that may condition its performance consequences. Furthermore, most research on management of coopetitive relationships has been mainly theoretical while empirical studies remain very rare.

Given that coopetition is nascent and so not much exists in the literature, this study reviews the broader interfirm relationship management literature. One of the most often acknowledged models of interfirm relationship management is that of alliance management capability, and accordingly the study relies on this stream of research to provide a background understanding on the conceptualization, antecedents and outcomes of interfirm relationship management capability for this coopetition capability study to build on. Appendix 2A presents a summary of key studies on the antecedents, and outcomes of alliance management capability while the following section highlights the factors that are mainly studied in this line of research.

2.7 Interfirm relationship management capability

Strategy scholars agree that while interfirm relationships are critical for improving competitive advantage and enhancing performance as they allow firms to learn from partners and to gain access to a diverse of external resources (Koza and Lewin, 2000; Russo, 2017), these relationships are challenging and risky and that not all firms succeed in interfirm relationships. For example, Bamford et al. (2003) observe that 30%-70% of alliances do not achieve their shared goals or operational benefits for forming those alliances. In fact, Koza and Lewin (2000) provide empirical evidence that approximately 50% of alliances do not achieve the objectives for forming those alliances. Against this backdrop, a number of studies have been launched to investigate what determines success in interfirm relationships. As a matter of fact, the strategic

alliance management literature provides a list of managerial tools, practices, and principles that firms may use to deal with the opportunities and challenges of strategic alliances (e.g., Kale and Singh, 2007; Kale and Singh, 2009; Schilke and Goerzen, 2010). For example, Kale and Singh (2007) and Schilke and Goerzen (2010) found that formalized management routines that enable firms effectively manage their strategic alliances have a positive impact on alliance success.

In recent years, there seems agreement among interfirm relationship scholars that alliance management capability, a firm's ability to handle or manage its alliances successfully (Schreiner et al., 2009), is a necessary prerequisite for success in interfirm relationships. In terms of theoretical logic and focus various perspectives have been used to study interfirm relationship management capability. These include the network theory, the dynamic capabilities perspective, organisational learning theory, the knowledge-based view, the resource based view and evolutionary economics. However, several studies argue that alliance management capability is a type of dynamic capability with the capacity to purposefully create, extend, or modify a firm's resource base, augmented to include the resources of its alliance partners (Schilke and Goerzen, 2010). As such the majority of the studies use the capabilities perspective to study alliance management capability.

Dynamic capabilities are "the firm's ability to integrate, build, and reconfigure internal and external competences to address changing environments" (Teece et al., 1997:516). According to Winter (2003), dynamic capabilities are based on collections of organizational routines. Teece et al's (1997) influential work shows that dynamic capabilities constitute coordination, learning, sensing and transformation (see chapter 3.1.2 for a detailed discussion on these). Recently, Schilke and Goerzen (2010),

building on dynamic capabilities perspective, provide evidence that alliance management capability is a higher-order construct consisting of interfirm coordination, portfolio coordination, learning, proactiveness and transformation. More specifically, interfirm coordination refers to routines that coordinate activities and resources of individual alliances (Gulati et al., 2005) while portfolio coordination pertains to the comprehensive coordination and governance of a firm's entire alliance portfolio to avoid duplication of actions and produce synergies among the individual alliance (Hoffmann, 2005). Learning routines refer to a firm's ability to learn and transfer knowledge from its alliance partner (Schilke and Goerzen, 2010). Proactiveness relates to a firm's ability to understand the environment and identify new valuable partnering opportunities (Sarkar et al., 2001) and lastly, transformation routines capture a firm's flexibility and willingness to modify alliances according to new environmental contingencies (Schilke and Goerzen, 2010).

Sarkar et al. (2009) have also examined the conceptual domain of alliance management capability and argue that alliance portfolio management consists of three principal organisational routines. First is partnering proactiveness which pertains to a firm's ability to discover and respond to new partnering opportunities faster than its competitors. Second comes relational dimension relates to a firm's skills to develop cooperative relationships of mutual trust and minimisation of opportunistic behaviours. Finally, portfolio coordination pertains to the integration and synchronisation of knowledge transfer flows and activities and resources in collaborative relationships. Similarly, Schreiner et al. (2009) conceptualises alliance management capability as a multidimensional construct and find that it is made up of three skills, namely, coordination, communication and bonding. Coordination relates to the ability to manage and coordinate alliance activities with partners while communication entails

sharing knowledge with partners. On the other hand, bonding pertains to building strong personal relationships among partners.

Being dynamic capabilities, the literature indicates that alliance capabilities are heterogeneously distributed across firms and this is one of the reasons for the variance in alliance success rate among companies (Russo, 2017). To understand why and how alliance capabilities are heterogeneously distributed across firms, scholars have studied how they develop. While a detailed discussion on the dynamic capability view is given in chapter three, a review of the dynamic capabilities literature in general and the alliance management capability literature in particular, in terms of antecedents and outcomes often studied in the literature is given in the following section.

2.7.1 Antecedents

Within the broad dynamic capabilities literature, scholars indicate that a number of internal and external environmental factors affect the likelihood of the development of dynamic capabilities. Internal drivers are firm specific and include the influence of managers, employees and organisational structure and processes on the development of dynamic capabilities (Eriksson, 2014; Ambrosini and Bowman, 2009). On the other hand, external factors enabling or inhibiting the development of dynamic capabilities comprise institutional and task environmental forces of munificence, complexity and dynamism are mainly examined (Barreto, 2010; Ambrosini and Bowman, 2009).

In terms of the specific alliance context, the majority of the work on the development of interfirm management capability investigates mainly the role played by alliance experience, alliance function, and learning in the development of alliance management capability. The three factors are sometimes used as proxies to measure alliance management capability (Niesten and Jolink, 2015). Alliance experience relates to the

number of alliance a firm has or the number of years a firm has been involved in alliances (Kale, 1999; Kale and Singh, 2007). It represents a firm's expertise in alliance management gained from prior alliances (Gulati, 1995; Kale and Singh, 2007) and the understanding is that firms that engage themselves in a great number of alliances are more likely to learn and have alliance management know-how. Building on the assumption that repeated engagements in an activity is beneficial as it leads to learning by doing (Levitt and March, 1988), several studies have found alliance experience to be positively associated with alliance capabilities (e.g., Heimeriks and Duysters, 2007; Simonin, 1997). However, some studies have argued that although alliance experience is an important antecedent of alliance management capability, it is not a sufficient input (e.g., Sluyts et al., 2011). Accordingly, alliance scholars have also explored the role of institutionalised structures, such as alliance office and alliance managers that coordinate all alliance-related activities of the firm. In studying these, scholars emphasise the need for alliance function which pertains to a firm unit or personnel that serves as a repository and distributor of alliance know-how (Kale, 1999; Sluyts et al., 2011) and have found that it can improve alliance management capability is several ways (e.g., Schilke and Goerzen, 2010; Kale and Singh, 2007; Heimerks et al., 2009; Sluyts et al., 2011).

Another factor posited as important input in the development of capabilities is learning. Drawing on organisational learning, evolutionary economics and dynamic capabilities, scholars have suggested (Zollo and Winter, 2002; Schilke, 2014b) that firms build their capabilities through different styles of articulation, codification, sharing and internalisation of lessons learned from previous experience. While several studies such as Kale and Singh (2007) and Sluyts et al. (2011) have found a positive link between

learning and alliance success, empirical research investigating learning mechanisms as antecedents of alliance management capability is thin in the literature.

2.7.2 Outcomes

A review of the dynamic capabilities literature reveals that the outcomes of dynamic capabilities can either be in terms of economic performance of the firm or changes in operational capabilities (Eriksson, 2014). Empirical studies have found either a direct relationship between dynamic capabilities and performance (e.g., Zhang, 2007) or an indirect one through some mechanisms that influence performance such as competitive advantage (e.g., Eisenhardt and Martin, 2000) and changes in operational capabilities (e.g., Chen et al., 2008).

With regard the performance outcomes of alliance management capability, an important concern in the literature is the lack of appropriate measure of performance achieved through interfirm relationships (Castro and Rolddan, 2015). Indeed questions of whether well-managed interfirm relationships should include synergies, economies of scale, positive spill overs and negative conflicts (Sarkar et al., 2009; Castro and Rolddan; 2015) still exist in the literature. While there exists this ambiguity in the literature (in terms of the performance outcomes of alliance management capability), studies most often consider the outcomes of such a capability on two levels. The first level focuses on collective objectives being met and is often coined as alliance success. This pertains to the achievement of mutual goals and the extent to which trust and harmony exists between alliance partners (Kale and Singh, 2007). Several studies have found a positive relationship between alliance management capability and alliance success (e.g., Schilke and Goerzen, 2010; Kale et al., 2002; Draulans et al., 2003). The second level of the outcomes of interfirm relationship management capability is the

individual firm specific outcomes. This relates to the extent to which a firm has achieved its objective of engaging in interfirm relationships such as improvement in a firm's financial position, innovation performance and learning (Gnyawali and Park, 2011).

Overall, while there seem agreement in the literature on the positive influence of alliance capability on alliance success, the majority of the studies have emphasised on the interfirm relationship performance while studies focusing on firm performance are rare in the literature even after Kale and Singh's (2007) recommendation for future research to measure alliance success using varied measures such as financial and accounting data. Another important concern in this line of research is the limited knowledge on the contingencies of interfirm relationship management capability.

2.8 Identified gaps in the literature

To summarise, a review of the coopetition literature in SMEs reveals that cooperative relationships with competitors are risky and challenging. While coopetition scholars have proposed the importance of coopetition capability to succeed in coopetitive relationships, the literature on coopetition does not provide many clues about the precise nature of coopetition capability, its build up and performance outcomes. A plausible explanation could be that because of the novelty of the coopetition research in general and coopetition capability in particular, little research has been done. Given the silence in the coopetition literature on the conceptual domain, drivers boundary conditions and performance outcomes of coopetition capability, the study borrows from existing theory in the broader interfirm relationship management literature.

However, while a useful starting point, gaps still exist in the interfirm relationship literature. For example, there appears an emphasis on internal firm factors such as alliance structure, alliance experience and alliance function, as drivers of alliance management capability to the neglect of external forces that enhance interfirm relationship management capability. In addition, while there is consensus in the literature on the value of interfirm relationship management capability, the literature is less clear on when such value is more or less realised. Actually, Schilke (2014a), Barretto (2010), and Eriksson (2014) acknowledge this gap and recommend that future studies should include other external and internal factors as contingencies in order to give a holistic picture of the dynamic capability-performance relationship. An additional deficiency of the extant literature is that much of extant research on the broader interfirm relationship and coopetition in particular, has mainly focused on larger organizations located in Western developed markets. The few studies that have examined interfirm cooperation in SMEs are silent on how such firms develop and manage relationships with competitors. Consequently, this study aims to address the apparent lack of scholarly works and follows a dynamic capability perspective and Schilke and Goerzen (2010) to develop the notion of coopetition capability and investigate its determinants, consequences, boundary conditions, and applicability to SMEs in a developing economy. A detailed discussion of the study is presented in the next chapter.

2.9 Chapter summary

This chapter has presented an overview of the literature on the coopetition concept. Extant literature on the benefits and costs of coopetition in SMEs has been reviewed. The chapter has also presented a broad view of the antecedent factors and outcomes often studied in the interfirm relationship management literature specifically drawing

from the alliance management capability. Gaps in the literature that this study aims to address have been highlighted. The next chapter proposes and discusses the study's conceptual model.

Chapter 3 : Conceptual framework and hypotheses

3.1 Introduction

In view of the research questions posed and the literature reviewed in the previous chapters, a model linking the drivers, boundary conditions and performance outcomes of coopetition capability is presented in this chapter. The chapter is organised into two sections. The first section discusses the theoretical underpinnings of the study, namely, resource based view, dynamic capability, institutional theory, and the contingency theory. The section also explains how the theories are integrated and applied in this study. The second section discusses the conceptual arguments to support the study's proposed relationships and hypotheses.

3.2 Theoretical underpinnings of the study

Considering its paradoxical and complex nature, an integrated theoretical lens consisting of the resource based view, dynamic capability view, institutional theory, and contingency theory informs the study of the domain, drivers, performance outcomes and boundary conditions of coopetition capability. Specifically, the study draws from the resource based view and dynamic capability to understand the conceptual domain, firm-specific drivers and performance outcomes of coopetition capability. On the other hand, the institutional theory informs the study how external institutional forces might drive development of coopetition capability. Moreover, the contingency theory provides insights into how firm specific and external environment forces might condition the performance outcomes of coopetition capability.

3.2.1 Resource based view

The resource based view (RBV) is a major pillar in the strategic management literature and is one of the frequently used theoretical lenses in interfirm relationship research (Kozlenkova et al., 2014). The RBV focuses on predicting firms' competitive advantage, specifically showing how firms' resources and capabilities serve as sources of competitive advantage. A key assumption of this theory is that resources and capabilities are heterogeneously distributed across firms and are imperfectly immobile, and as such, a firm with resources and capabilities deployed in an appropriate environment is able to conceive of and implement strategies that improve its efficiency and effectiveness (Barney, 1986; 1991a; Peteraf, 1993; Wernerfelt, 1984).

A firm's resources are "assets and capabilities that are available and useful in detecting and responding to market opportunities or threats" (Wade and Hulland, 2004: 109). These resources are classified into physical capital, human capital, and organisational capital (Barney, 1991b). Physical capital resources include the tangible resources available to a firm such as a firm's plant and equipment, its geographic location, and its access to raw materials and finances. Human capital resources relate to the training, experience, judgement, intelligence, relationships, and insight of individual managers and employees in a firm while organisational capital resources refer to a firm's formal reporting structure, its formal and informal planning, culture, controlling and coordinating systems, as well as informal relations among groups within a firm and between a firm and those in its environment. On the other hand, capability refers to the ability of an organisation to perform a coordinated set of tasks, utilising organisational resources, for the purpose of achieving a particular end result (Helfat and Peteraf, 2003). See the next section (3.2.2) for a detailed discussion on capabilities.

However, not all firm resources and capabilities are strategically relevant sources of sustained competitive advantage for a firm (Barney, 2001a). Four attributes (Barney, 2001b; Priem and Butler, 2001; Wade and Hulland, 2004) must be met for a firm's resource to qualify as a source of sustained competitive advantage and these are, the extent to which a resource is: (1) valuable, in the sense that it can be used to exploit opportunities and/or neutralise threats in a firm's environment; (2) rare among a firm's current and potential competition; (3) imperfectly imitable, and (4) cannot be substituted.

A central thesis of the RBV is that these resources and capabilities may not only be found within the firm but also outside the boundaries of the firm, for which reason the RBV has been useful in providing a strong explanatory power of leveraging scarce firm-specific resources through interfirm relationships. For example, strategic alliance scholars have argued, using the RBV, that firms can obtain access to valuable resources and capabilities through inter-organisational alliances to improve performance (e.g., Draulans et al., 2003; Dyer and Singh, 1998; Kale and Singh, 2007; Kogut, 1989; Schilke and Goerzen, 2010; Wang and Rajagopalan, 2015). On that account, the RBV provides useful insights in this study to understand and to explain the resource and capability related antecedents and contingencies to coopetition capability and to firm performance. More specifically, the study postulates that managerial ties and coopetition learning process are firm-specific resources that influence the development of coopetition capability. The study also draws from the RBV to examine coopetition effectiveness as a firm-specific resource that enhances financial performance.

Although the RBV is a useful lens in explaining competitive advantage and performance of organisations, it is not without criticisms. For example, it is criticized

of being static in its nature and inadequate in explaining a firm's competitive advantage in changing environments (Arend and Lévesque, 2010; El Shafeey and Trott, 2014; Kraaijenbrink et al., 2010; Priem and Butler, 2001). The fact that the RBV does not explicitly define and specify the value of a resource is another concern raised by the critics who view it as being overly inclusive and thus unworkable. Importantly, it has been criticised for not being able to explain how firm resources are developed and deployed to earn marketplace advantage. However, despite its limitations, scholars agree that RBV remains an important theoretical lens for explaining firm performance (e.g., Barney, 2001b; Piercy et al., 1998; Kozlenkova et al., 2014; Peng, 2001). In fact, Kozlenkova et al., (2014) provide evidence that the use of the RBV as a framework for explaining and predicting competitive advantage and performance outcomes in marketing research has increased by more than 500% in the past decade.

3.2.2 Dynamic capability view

In view of the limitations of the resource-based view, scholars have sought to explain sources of competitive advantage and firm performance by focusing specifically on the dynamics of organisational capabilities (Helfat et al., 2009; Teece, 2012; Winter, 2000). According to Winter (2000:983), "an organisational capability is a high-level routine (or collection of routines) that, together with its implementing input flows, confers upon an organisation's management a set of decision options for producing significant outputs of a particular type". Generally, the literature classifies capabilities into two, namely, operational capabilities and dynamic capabilities (Barreto, 2010; Helfat and Winter, 2011; Newey and Zahra, 2009; Winter, 2003). An operational capability largely involves performing an activity, such as manufacturing a particular product, using a collection of routines to execute and coordinate a variety of tasks required to perform the activity (Helfat and Winter, 2011). These kinds of capabilities are also referred to as 'zero-level' ordinary capabilities and support a firm's livelihood

in the short term (Barreto, 2010). On the other hand, a dynamic capability is a "learned and stable pattern of collective activity through which an organisation systematically generates and modifies its operating routines in pursuit of improved effectiveness" (Zollo and Winter, 2002:340). Similar definitions of dynamic capabilities as organisational routines and processes that enable firms to strategically manage internal and external skills and competencies to enhance performance are provided by Eisenhardt and Martin (2000) and Teece et al. (1997).

From these definitions and clarifications, it can be deduced that although the two types of capabilities are conceptually distinct in nature, they are related in the sense that, dynamic capabilities govern the rate of change of ordinary operational capabilities (Collis, 1994; Zollo and Winter, 2002). In other words, dynamic capabilities are higher-level capabilities concerned with adaptation and change as they build, integrate, or reconfigure other resources and capabilities (Helfat and Peteraf, 2003). Teece et al. (1997) in their influential work on dynamic capabilities explain that dynamic capabilities do not involve production of a good or provision of a marketable service but instead they focus on building, integrating, or reconfiguring operational capabilities towards a desired organisational goal attainment. This suggests that dynamic capabilities do not directly affect output for the firm in which they reside, but indirectly contribute to the output of the firm through operational capabilities (Barreto, 2010; Newey and Zahra, 2009; Teece et al., 1997).

The dynamic capability view of competitive advantage and firm performance emphasises on organisational routines that help a firm to perform coordinated set of tasks by utilising organisation resources to achieve and sustain competitive advantage (Teece et al, 1997). Routine here refers to behaviour that is learned and highly

repetitive and is founded in part in tacit knowledge (Collis, 1994). It is an extension of the RBV which emphasises the reconfiguration of firm resources and capabilities (Helfat and Peteraf, 2003). The distinction however is that while the RBV focuses on heterogeneity of resources and capabilities among firms as sources of competitive advantage (Barney, 1991a; Priem and Butler, 2001), the dynamic capability approach explains how deliberate organisational efforts help create, extend and modify firms' resource base (Eisenhardt and Martin, 2000; Helfat, 1997; Teece et al., 1997). Thus, the dynamic capability approach addresses RBV's static nature and overly inclusive limitation by explaining how and why organisational routines and processes are used to transform resources and capabilities into sustainable competitive advantage in changing environments.

Barreto (2010) provides a comprehensive review on dynamic capabilities particularly highlighting six major theoretical underpinnings of dynamic capabilities in terms of the *nature, role, creation and development, context, heterogeneity and outcome*. In terms of their nature, dynamic capabilities include abilities or capacities or processes or routines to do something. Their role is to integrate or coordinate, build and reconfigure both internal and external competences. Dynamic capabilities are built rather than bought implying that their creation and their evolutionary paths are embedded in organisational processes and are more focussed on adapting and shaping the external environment. Although the literature is not clear on the kind of environment relevant for dynamic capabilities, researchers seem to suggest that dynamic capabilities are relevant for both stable and dynamic environments (see Baretto, 2010). Similar with the RBV's resources and capabilities framework, dynamic capabilities are heterogeneous across firms as they depend on firm-specific routines and processes. Finally, the dynamic capability approach supplements the RBV as it postulates sustained

competitive advantage as the direct outcome of dynamic capabilities provided that the new resource configuration proves to be valuable, rare, inimitable, and non-substitutable.

However, some scholars have argued that although the dynamic capability concept is appealing in explaining competitive advantage and performance, it is rather vague and elusive and as such it is hard to be observed and measured (Kraatz and Zajac, 2001; Newbert, 2007). Despite the criticisms several researchers (e.g., Schilke and Goerzen, 2010; Helfat et al., 2009; O'reilly and Tushman, 2007; Teece, 2007; Zahra et al., 2006; Czakon, 2009) building on Teece and colleagues (1997) landmark article elaborate the constituents of dynamic capabilities and emphasise the importance of coordination, learning, sensing, and transformation in their discussions and empirical examination of organisational routines. Coordination routines are aimed at allocating resources, assigning tasks, and synchronising activities; learning routines pertain to the processes of generating new knowledge and building new thinking; sensing routines involve scanning, and searching to identify new market opportunities; and transformation routines are aimed at making structural changes to existing business models in response to changes in market conditions (Schilke and Goerzen, 2010; Teece, 2007; Helfat et al, 2009). These four organisational routines are suggested to collectively explain the mechanisms that enable organisations to create, extend and modify their resource base.

3.2.2.1 Coopetition capability as a dynamic capability

The dynamic capability literature suggests that alliance management is a distinct dynamic capability that allows firms to acquire resources and deploy them in ways that match a firm's market environment to achieve superior performance. For example, Eisenhardt and Martin (2000) informs that dynamic capabilities consist of specific strategic and organizational processes including product development, alliance

building, and strategic decision making that create value for firms within a dynamic market space by manipulating resources into new value-creating strategies. In fact, recent empirical studies on alliance success show that firms that had invested in routines and mechanisms for managing interfirm relationships recorded positive interfirm relationship outcomes (e.g., Schilke and Goerzen, 2010; Heimeriks and Duysters, 2007; Kale and Singh, 2007).

Given the paucity of theory on coopetition, this study builds on the theoretical notion of dynamic capabilities and follows previous interfirm relationship management literature (e.g., Teece et al., 1997; Eisenhardt and Martin,2000; Grant, 1996a; Makadok, 2001; Gnyawali and Park, 2011; Thomke and Kuemmerle, 2002; Schilke and Goerzen, 2010) to conceptualise coopetition capability as a higher-order latent organisational capability comprising of organisational routines that enable firms to manage cooperative relationships with competitors to *realise new resource configurations and new opportunities.* This capability is particularly relevant to organisations as the market space within which firms compete continue to collide, split, evolve, and disappear. As a dynamic capability, coopetition capability affords a firm with the ability to perform repeatable patterns of actions (including identifying, initiating, coordinating and restructuring coopetitive relationships) to purposefully create, extend, or modify its resource base in cooperation with coopeting partners (Schilke and Goerzen, 2010).

This study's focus, therefore, is on a firm's processes and routines that collectively endowed it with a capability for managing cooperative relationships with competitors by capturing, disseminating and applying coopetition management knowledge. Consistent with Schilke and Goerzen's (2010) work and with insights gathered from qualitative field interviews (see appendix 4Aiii) coopetition capability is seen as a

multi-layered phenomenon consisting of five identifiable and specific organisational routines: interfirm coopetition coordination, coopetition portfolio coordination, coopetition learning, coopetition proactiveness and coopetition transformation. Interfirm coopetition coordination captures the extent to which a focal firm coordinates its internal business activities with a coopeting partner while coopetition portfolio coordination relates to how a firm comprehensively synchronises its entire pool of coopetitive relationships to avoid relationship overlaps, conflicts and duplication and also to be optimal in allocation of resources to coopetitive projects (Hoffmann, 2005). Coopetition learning refers to a firm's ability to learn and assimilate knowledge from its coopeting partners. Through learning, firms are also able to identify opportunities for joint action (Schilke and Goerzen, 2010) as well as proactively adapt their coopetitive activities accordingly. Coopetition proactiveness is a market sensing mechanism which enables a firm to understand the market environment and identify new valuable coopetition opportunities (Sarkar et al., 2001). Finally, coopetition transformation pertains to a firm's willingness to modify its coopetitive relationships to conform to new environmental contingencies (Reuer and Zollo, 2000).

Since capabilities are a collection of activities and practices that accumulate as a result of years of practice, it is important that these five activities are theoretically brought together to explain an overall coopetition capability phenomenon. As a multidimensional construct, this study follows Law et al. (1998:741) to argue that "the dimensions of a multidimensional construct can be conceptualised under an overall abstraction, and it is theoretically meaningful and parsimonious to use this overall abstraction as a representation of the dimensions". In line with this contention, this research argues that the relations between the overall coopetition capability construct and its dimensions are well-specified theoretically, hence it is justified to make

conclusions about the dimensions at the overall construct level. This aggregation approach is in line with Law et al. (1998) contention that multidimensional constructs exist at a deeper conceptual level than their dimensions, and for that matter it is more parsimonious for the dimensions to be discussed in relations to an overall presentation of the construct. In view of this contention, in discussing coopetition capability in this chapter the study focuses on explaining the overall of coopetition capability as a dynamic capability that affords a firm the know-how and competences to manage its relationships with competitors to extend its resource base (Helfat et al., 2009). Through this capability, firms are able to proactively position themselves in ways that allow them to generate and exploit internal and external firm specific competencies.

The study further argues that coopetition capability exhibits several key characteristics of the RBV (Barney, 1991a) and DCV (Teece et al., 1997). First, it is valuable as its utility will not diminish when it is deployed (Prahalad and Hamel, 1990). Second, it is hard to imitate because the process for developing coopetition capability is embedded in cognitive routines within the firm and as such cannot be observed by competitors. Third, the fact that these processes and routines are created within a firm or between firms, suggests that they cannot be purchased in the open market, hence their immobility. Finally, it is rare because these processes are firm specific and may not be possessed by a large number of rivals, hence its heterogeneity across firms. This conceptualisation of coopetition capability is therefore consistent with the RBV (Barney, 1991a) and DCV (Teece et al., 1997) that a firm that possesses such resources with all four of these attributes will achieve a sustainable competitive advantage.

3.2.3 Institutional theory

The institutional theory postulates that institutional prescriptions and norms shape the nature of much economic activity as they regulate and motivate the behaviour of actors

in a given environment (Lau et al., 2002; Scott, 1995; 2005; DiMaggio, 1994; North, 1990). The understanding under this lens is that organizational activities and outcomes are affected by the environmental context in which the organization is embedded and hence the institutional perspective is used to explain how various groups and organisations better secure their positions and legitimacy by conforming to the rules and norms of the institutional framework within which they operate (DiMaggio, 1994; DiMaggio and Powell, 1983; Pfeffer and Salancik, 1978; Peng, 2003).

According to Grewal and Dharwadkar (2002), institutions; as reflected in government legislation, property rights regimes, as well as in the professional and commercial norms of behaviour, exert conformance pressures on firms and influence strategic choices. These institutional arrangements determine the boundaries and paths for firm behaviour in a given environment and as such can produce entry barriers or create opportunities for action (Bruton et al., 2010; Fligstein, 1996; Grewal and Dharwadkar, 2002; North, 1990). For this reason, variation in strategic actions across contexts may be explained as a function of differences in the existence, saliency, and intensity of particular institutional arrangements. In other words, firms are constrained in their choice of strategic actions in that choice has to be made from a defined set of legitimate options as determined by institutional forces within a given industry, country or region (North, 1990).

In following this theory, three institutional pillars: regulatory, cognitive and normative provided by Scott (1995), are commonly studied in the general management literature. The regulatory force includes the laws and political power that regulate the behaviour and actions of organisations while the cognitive and normative institutional pillars are socially constructed and draw on culture (Manolova et al., 2008). The cognitive pillar

focuses on institutional influence that develops over time through social interactions (Ahlstrom and Bruton, 2010). On the other hand, the normative force defines the behaviours and actions that are expected of organisations (Manolova et al., 2008). As such, both cognitive and normative pillars are highly inert beliefs that occur at a more subconscious level (Hoffman, 1999).

This study focuses on regulatory institutional environment to explain governmental institutional regulatory forces that drive a firm to develop coopetitive relationships (DiMaggio and Powell, 1983; Hoffman, 1999). More specifically, the study examines the influence of institutional support on the development and the performance outcomes of coopetition capability. While limited empirical research has been done on how institutional support shapes business activity, the literature suggests that the institutional support arm of the regulatory force, is critical for any business success and strategic action. In fact, Scott (2013), recognising that most treatments of institutions underscore the legal boundaries and imposition of restrictions to control and constrain behaviour, highlights that government regulation also involves provision of stimulus, guidelines, and resources to support and empower business activities.

Institutional support pertains to institutional arrangements that promote and facilitate effective macroeconomic policies, liberalise trade as well as protect property rights among its many roles (Rondinelli and Behrman, 2000). According to Xu and Meyer (2013) government support is common in developing economies. Although they rarely become directly involved in decision making due to trade liberalisation and privatisation policies, developing economy governments, in their efforts to encourage industrial growth and job creation, tend to implement policies that support firms in specific industries or of specific sizes or specific ownership (Luo et al., 2010; WIR,

2008; Cai et al., 2010). Typical business supports include industry guidelines, provision of low interest financial services, training, platforms to meet and form contacts and other mechanisms to support and boost performance of firms (Batra and Mahmood, 2003; Acevedo and Tan, 2011). Within the framework of governmental supports is also the propensity of governments to encourage cooperation between industry players to reduce the risk of monopolistic behaviour. For example, the Zambian government provides preferential procurement incentives to foreign business entities that are in partnerships with specific group of local industry players (MCTI, 2011).

3.2.4 Contingency theory

The contingency theory is a subset of the contingency approach in science which postulates that the effect of one variable on another depends upon some third variable (Donaldson, 1999). The contingency approach suggests that there is no one best way for organising a firm and that firm performance is influenced by external and internal constraints (Donaldson, 2001). Some internal constraints are: structure, strategy, and resources while external constraints include economic, technological, legal, political and task environment contingencies (Burns and Stalker, 1961; Donaldson, 2001; Child, 1975; Wilden et al., 2013). The contingency theory perspective to organisational performance assumes that fit between an organisational behaviour and its context, whether internal or external, determines performance of organisations (Venkatraman, 1989; Van de Ven and Drazin, 1984). Therefore, following this perspective, researchers tend to consider these constraints when analysing firm performance.

While the dynamic capabilities perspective provides a strong theoretical base to explain how organisational routines and processes enable a firm to develop and deploy its resources and capabilities to earn superior performance, this perspective has been criticised for its limited discussion on when resources and capabilities become more or

less useful in driving organisational performance (see Arend and Bromiley, 2009; Barreto, 2010; Wilden et al., 2013). Indeed, in as much as it is expected that firms with greater dynamic capabilities are more likely to achieve superior performance, it may be an overstatement to assume that dynamic capabilities will always drive performance. As Teece et al. (1997) suggest, the influence of dynamic capabilities on firm performance may be contingent on the firm's context. To this end, Shamsie et al. (2009) provide evidence to show that the extent to which dynamic capabilities lead to performance is dependent on the context within which the capabilities are deployed. Similarly, Schilke (2014a) examines and finds evidence to show that environmental dynamism moderates the effect of two dynamic capabilities, namely; alliance management capability and new product development capability, on competitive advantage.

Although there is a lacuna in the interfirm relationships literature with regard to studies that incorporate contingencies on the link between interfirm relationship management capability and performance outcomes (Schilke (2014a; 2014b) as notable exceptions), this study follows precedence from these limited earlier studies on dynamic capabilities to take a contingent view of the consequences of coopetition capability. Specifically, the study argues that the performance benefits of coopetition capability depend not only on the underlying organisational routines, but also on the institutional context within which the capability is deployed. Furthermore, cognisant of the fact that firm behaviour is at least partly constrained or facilitated by firm specific factors (Venkatraman, 1989), the study argues that coopetition learning process is a firm specific internal contingency force whose variability can moderate the effect of coopetition capability on performance. In taking this contingency approach, therefore, this study directly responds to several calls on scholars to incorporate relevant contingencies to better

understand the consequences of dynamic capabilities (e.g., Schilke, 2014a; Barreto, 2010; Eriksson, 2014; Wilden et al., 2013).

3.3 Conceptual model and hypotheses development

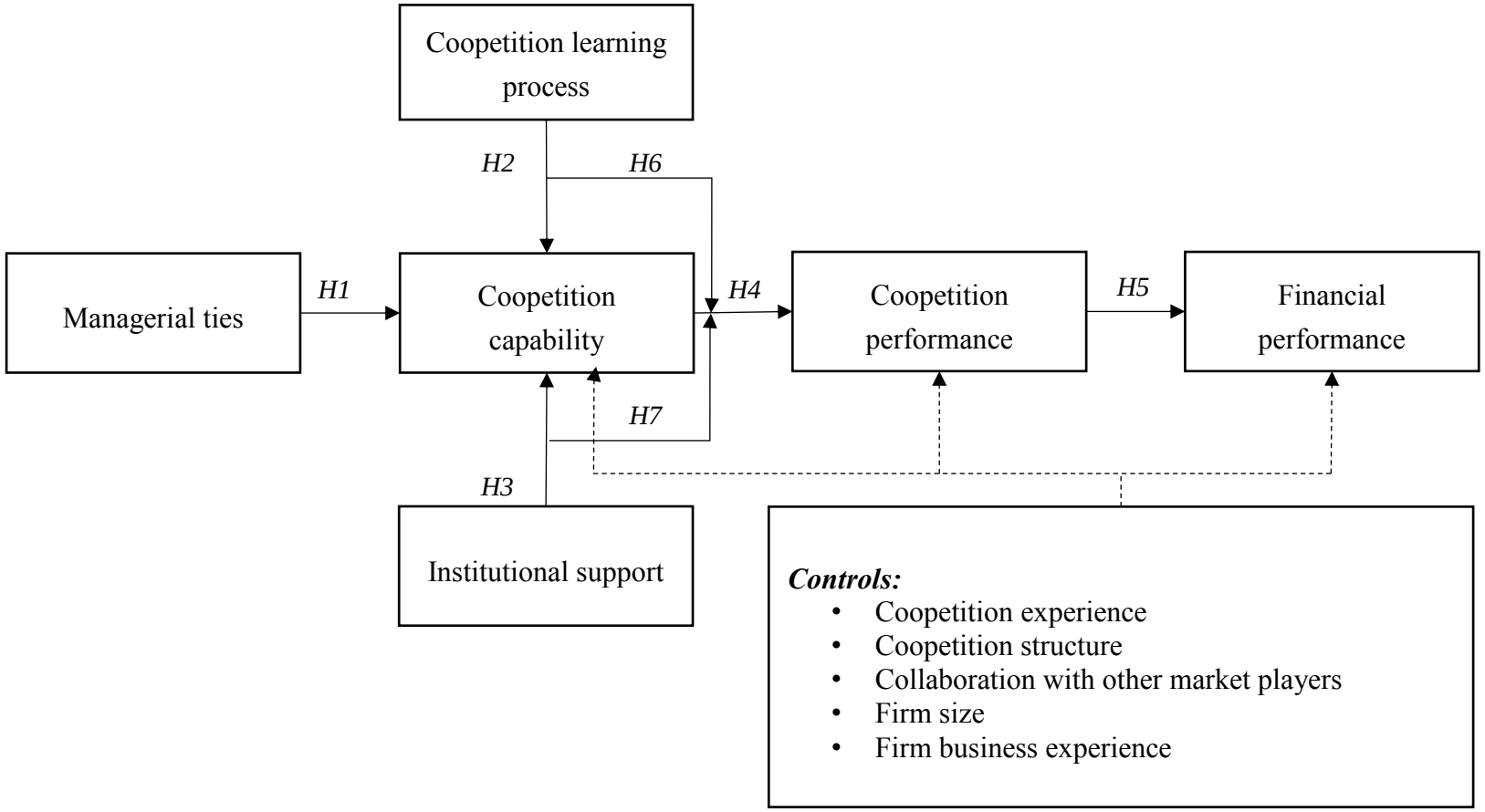
Figure 3.1 presents the study's conceptual model hypothesising the proposed drivers, boundary conditions and performance outcomes of coopetition capability. Managerial ties and coopetition learning process represent internal organisational resource factors while institutional support is hypothesised as an external factor that facilitate the development of coopetition capability, with the later driving coopetition performance. The model also proposes coopetition learning process and institutional support as contingencies on the coopetition capability-coopetition performance link.

The model was developed from a blend of arguments and notions taken from the exploratory field interviews (see appendix 4Aiii:), extant research and theories, and the researcher's own logic. The study recognises the fact that the model does not exhaust the possible factors of the drivers, performance outcomes and boundary conditions of coopetition capability. However, in the researcher's guided opinion, based on the relevant theoretical lenses earlier discussed, existing literature on interfirm relationship management and exploratory field interviews, they are the most critical variables.

In addition, the model includes variables at the individual (managerial ties), organisational (coopetition learning process, coopetition performance, financial performance), and environmental (institutional support) levels consistent with recommendation by strategy scholars (e.g., Barreto, 2010; Eriksson, 2014; Covin and Slevin, 1991) for more comprehensive and reasonably adequate in scope research models that include variables at the three levels. Furthermore, the inclusion of

boundary conditions is acquainted by the fact that performance is not as easily achieved as normally assumed, rather, it depends on other variables (Granovetter, 1985; North, 1990; Donaldson, 2001; Venkatraman, 1989). Moreover, the study controls for other variables that are likely to have an influence on the hypothesised relationships.

Figure 3.1:Conceptual Model



3.3.1 The effect of managerial ties on coopetition capability

Generally, firms establish interfirm relationships and exchange mechanisms through behaviours and actions of managers. In the particular case of SMEs, it is argued that such firms regard their top executives as one of the most important human resource assets in driving a firm's success. The contention is that such businesses largely rely on top managers, who are usually the owners, for making and implementing most of the important decisions (Lubatkin et al., 2006; Man et al., 2002; Steenkamp and Kashyap, 2010). The literature suggests that managers offer two types of resources, namely, human capital as indicated by their experience, and social capital as indicated by their external ties (Granovetter, 1985; Shane and Cable, 2002; McGee et al., 1995; Li and Zhang, 2007; Augier and Teece, 2009). Managerial ties refer to a manager's social relations and networks with managers in other business entities and ties to leaders in governmental, non-governmental and key industry stakeholders (Peng and Luo, 2000).

From a resource-based view perspective, managerial ties are viewed in this study as firm specific resources (Barney, 1991a) that is critical to the development of coopetition capability. Li and Zhang (2007) postulate that managerial ties allow firms to access critical resources, such as information, which can facilitate learning and development of expertise and skills including management and exploitation of interfirm relationships. Thus, interactions with other executives enable managers to have a better understanding of critical interfirm relationship processes and issues as they learn from their own experience or experience of others in the social relations and networks. In addition, managerial ties may provide managers opportunities to identify and capture business opportunities and, can be used as a foundation for understanding the developments of coopetition sensing and seizing (Augier and Teece, 2009). Since managers play a critical role in both identifying and capturing strategic opportunities,

coordinating the necessary resources, and initiating new business models (Steenkamp and Kashyap, 2010), it is reasonable to expect firms with strong managerial ties to more effectively coordinate cooperative relations with competitors; to be more proactive in identifying and exploiting coopetitive opportunities; and to restructure coopetitive relationships when need arises.

Although coopetitive relationships are more complex than other relationships that do not involve rival firms working together, the extent to which firms develop the ability to effectively cooperate with competitors can to some extent be explained by the way in which the individual executives in the firm relate with managers of other firms in the industry. Hence, a firm's ability to manage cooperation with competitors can be considered as an extension of its management skills and experience of its managerial ties. Through these ties, managers are able to learn and apply approaches and practices related to effectively managing external relationships and this should be an impetus for coopetition capability. In fact, Lu et al. (2010) provide evidence that managerial ties has a positive effect on the development of information acquisition capability. Further, managerial ties provides firms access to industry information held by competing firms (Li et al., 2014), to the extent that closer ties between managers of a focal firm and managers in other firms may grant firms access to industry information, which may subsequently strengthen a firm's ability to manage relationships with collaborating competitors. Consequently, the study hypothesises that;

H1: *Managerial ties is positively related to coopetition capability.*

3.3.2 Coopetition learning process and coopetition capability

Coopetition learning process refers to internal processes that help a firm learn, accumulate and leverage coopetition management know-how and best practices (Kale and Singh, 2007). The literature recognises organisational learning processes and

routines as key resources within the firm for enhancing a firm's interfirm relationship performance. Indeed, there is evidence that a firm's ability to learn helps a firm to develop superior knowledge on how interfirm relationships should be managed, which leads to a significantly better interfirm relationship outcome (e.g. Kale and Singh, 2007; Sluyts et al., 2011). Despite this revelation, there remains a lack of clarity with respect to the relationship between interfirm relationship management capability and the learning process in the strategic interfirm relationship literature.

Although strategic alliance scholars (e.g. Draulans et al., 2003, Kale and Singh, 2007; Schike and Goerzen, 2010; Sluyts et al., 2011) have tried to examine how alliance management capability develops, and have suggested a number of factors such as alliance function, alliance experience and top management support, as necessary for the successful development of alliance management capability, the link between learning process and interfirm relationship management capability is not clearly provided for in the literature. In fact, Kale and Singh (2007) have examined the learning process and have conceptualised it as a second-order dynamic capability that is positively associated with alliance success. Yet, the dynamic capabilities literature hints to a link between learning and the development of dynamic capabilities. For example, Zollo and Winter (2002) posit that dynamic capabilities arise from learning and that learning mechanisms could be regarded as second-order dynamic capabilities. They further suggest that learning mechanisms shape operating routines directly as well as by the intermediate step of dynamic capabilities.

This study draws motivation from the RBV to argue that coopetition learning process is a firm specific resource that is positively related to coopetition capability. In line with previous strategy literature on organisational learning (Kogut and Zander, 1992; Zollo

and Winter, 2002; Zollo and Singh, 2004; Kale and Singh, 2007; Sluyts et al., 2011) the study distinguishes four types of coopetition learning processes: articulation, codification, sharing and internalisation. Articulation relates to the extent to which managers are able to externalise, through spoken or written words, personally held coopetition experiences and knowledge (Zollo and Singh, 2004). Through articulation, it is expected that coopetition know-how is made more explicit and should therefore allow a firm (other members within the firm) easy access to coopetition knowledge and to better understand its coopetition experiences. Consequently, this should make a firm to be more effective in managing both future and ongoing coopetitive relationships.

Codification involves documentation of existing knowledge and using the codified resources to guide action (Kogut and Zander, 1992; Nonaka, 1994; Zollo and Winter, 2002). As such, a firm that invests in coopetition guidelines, checklists and manuals will have a clear guide and framework for managing coopetitive relationships and this should improve its coopetition skills and competencies.

This study further argues that by sharing their coopetition experiences and knowledge within the firm, firms will be able to increase their coopetition know-how. In fact, the RBV of the firm postulates that knowledge sharing not only between firms, but even more importantly within the firm is critical for competitive advantage (Barney, 1991a; Grant, 1996b). Indeed, as Grant (1996b) demonstrates, organisational capability is an outcome of a firm's ability to harness and integrate the knowledge (both tacit and/or codified) of many individuals within a firm. In fact, Kale and Singh (2007) calls for face-to-face dialogue within firms to allow members to share individually held tacit knowledge and to help managers conceptualise alliance knowledge that is being disseminated throughout the firm. Lastly, internalisation processes such as training and

mentorship programs allows firms to absorb coopetition knowledge and best practices, and thereby be able to manage coopetitive relationships more effectively. Taken together, all the four aspects of coopetition learning process should increase a firm's coopetition management knowledge, and thus developing an increased coopetition management capability.

Based on this, it is suggested in this study that coopetition learning processes which relate to deliberate efforts to articulate, codify, share, and internalise coopetition know-how within a firm, is positively related to coopetition capability. The reasoning is that through these processes, a firm is able to learn, accumulate, and leverage interfirm relationship management know-how and best practices (Kale and Singh, 2007; Sluyts et al., 2011; Zollo and Winter, 2002), that will not only allow a firm to understand its current coopetition situation but also permit it to predict future changes. Coopetition learning process should allow a firm to generate superior knowledge about its coopetitive relationships and in this sense, should be a precondition for coopetition capability. Consequently, the study expects that:

H2: *Coopetition learning process is positively related to coopetition capability.*

3.3.3 The effect of institutional support on coopetition capability

While previous scholarly works have overlooked the influence of the institutional environment in explaining the drivers of coopetition, the role of institutions in shaping individual and organisational behaviour cannot be overemphasised. The fact that firms are embedded in institutional frameworks of norms, values, and rules of exchange (North, 1990), suggests that firm behaviour is constrained or facilitated by these institutional forces (Meyer and Peng, 2005; North, 1990; Fligstein, 1996). Institutional arrangements, which include governmental legislations, regulatory requirements, enforcement mechanisms, incentive structures, as well as the presence and absence of

professional and commercial norms of acceptable behaviour constrain or stimulate a firm's action and/or behaviour by affecting their value or their cost (North, 1990; Dunning and Lundan, 2008; Meyer et al., 2009; Peng, 2003). Therefore, as Hitt et al. (2004) submit, institutional arrangements can produce entry barriers or create opportunities for strategic actions.

Accordingly, this study draws from the institutional theory to postulate that a firm may make a choice to develop coopetition capability on the basis of its perception and interpretation of the value and cost of the prevailing institutional environment structures, practices, rules and requirements. For example, if the institutional environment has rules or mechanisms that motivate a firm to cooperate with competitors, the firm will invest more in managing coopetitive relationships so as to benefit more from the relationships. However, if coopetition is perceived as unwelcome behaviour and therefore increasingly discouraged in an institutional environment, a firm is more likely to be prohibited from engaging in this relationship and thus is not likely to invest in coopetition capability. As such, the extent to which a firm develops coopetition capability is likely to be driven by the institutional environment. Therefore, the study expects institutional support, that is, increases in levels of institutional support as demonstrated by business support provided by governmental agencies would be associated with a greater propensity of a firm to develop coopetition capability.

This expectation is in line with previous coopetition research. For example, Mariani's (2007) study finds that the regulatory demand by Italian regional policy makers through the imposition of cooperation on firms triggered the emergence of coopetition among three competitive opera houses. Additionally, Cai et al. (2010) find that government support has a direct positive effect on information sharing and collaborative planning in

Chinese manufacturing companies surveyed provides further support for the present prediction. Moreover, evidence from the study's field interviews (see appendix 4Aiii:) shows that government intervention in SME business activities is common in Zambia, the setting for this study. Although not directly involved in the decision making of SMEs due to its privatisation policy, the government implements policies that provide support to SME businesses, including tax holidays to SMEs in specific industries. For example, it was revealed during the field interviews that government's requirement for local content forced foreign firms to cooperate with competing local firms. Thus, drawing from the institutional environment logic and these considerations, this study argues that increases in institutional support for interfirm cooperation will be associated with increases in coopetition capability development. As such, it is hypothesised that;

H3: *Institutional support is positively related to coopetition capability.*

3.3.4 Coopetition capability and coopetition performance

With the growing challenges associated with interfirm relationships, business strategy scholars (e.g., Heimeriks and Duysters, 2007; Kale et al., 2002; Kogut, 1989; Schilke and Goerzen, 2010; Simonin, 1997) argue that special management skills must be implemented to strengthen a firm's interfirm relationship performance. In fact, prior strategic alliance research (e.g., Sarkar et al., 2001; Schilke and Goerzen, 2010; Sluyts et al., 2011) demonstrates that alliance management capability leads to superior alliance performance as it enables firms to deal with the uncertainties and challenges characterised in interfirm relationships to successfully manage their alliances.

Considering the numerous challenges associated with cooperation with competitors provided in the literature (see Bouncken et al., 2015) and also uncovered in the qualitative field interviews (e.g., misunderstandings, loss of control, opportunism), coopetition capability in this study is viewed as a relationship management capability

that enables a firm to efficiently and effectively execute coopetitive tasks and exploit opportunities that coopetition creates to its own benefit. The study draws motivation from the RBV and dynamic capability to develop a better understanding of the role of coopetition capability on coopetition performance, defined as a firm's success with coopetitive relationships. Coopetition capability is viewed as an inimitable dynamic capability that enables a firm to efficiently and effectively execute coopetition tasks and exploit opportunities that the coopetition creates to its own benefit (Schilke and Goerzen, 2010). A Firm with high levels of coopetition capability is proactive and responsive in both identifying and exploiting partnering opportunities, and as such is more likely to initiate pre-emptive actions in response to identified opportunities faster than a firm with low levels, and thus have a competitive edge in coopetition. In addition, a firm with high levels of coopetition capability is not only far more quickly able to identify appropriate coopeting partners, engage in and manage coopetitive relationships in a way that benefits it but also possibly restructure and terminate unprofitable relationships that could damage performance (Schilke and Goerzen, 2010).

Following these insights, it is possible to argue that because coopetition capability is difficult to obtain and imitate (see section 3.2.2.1) and it allows firms to exploit coopetitive relationships fully by anticipating problems, mobilising resources and seeking synergies, it has the potential to enhance a firm's coopetitive performance. This argument is consistent with prior strategic alliance research which has hinted to a positive relationship between alliance management capability and alliance success (Kogut, 1989; Simonin, 1997; Draulans et al., 2003; Kale and Singh, 2009; Schilke and Goerzen, 2010; Sluyts et al., 2011). Actually, Gnyawali and Park (2011) stress the importance of firms to develop relationship management capabilities that allow anticipation of trends and faster adjustments to changes in coopetitive relationships. In

fact, they demonstrate how Samsung's internal capability to manage interfirm relationships allowed it to benefit more from its alliance with Sony. Gonçalves and Conceição (2008) also advise managers to develop interfirm relationship management capability if they are to fully exploit the benefits of alliances.

H4*: Coopetition capability is positively related to coopetition performance.*

3.3.5 Coopetition performance and financial performance

Notwithstanding the fact that coopetition is pursued for a variety of reasons, the study argues that the overriding reason for the interest in the coopetition topic is the widespread belief that it stimulates economic performance of individual firms. Actually, the interfirm relationship literature suggests that firms engage in collaborative efforts with other firms to pool their resources and capabilities together in an effort to achieve both mutual and individual goals. Mutual goals relate to common goals on which the relationships are built and held together while individual goals are firm specific such as market and financial performance (Wilson, 1995). There is evidence in the literature that firms in coopetitive relationships are able to reap a variety of benefits such as cost and risk sharing, access to a variety of coopetitive partner's skills, knowledge, resources and capabilities in various value chain activities to enhance performance (Bouncken et al., 2015; Gnyawali and Park, 2009). In light of this, the study views that any system or model of coopetition would be remiss to ignore the construct of firm performance.

This study draws from the RBV to model coopetition performance i.e. successful relationships with competitors, as an inimitable socially complex firm resource that enables firms to benefit from greater access to resources and expanded market opportunities and improve its performance. According to Barney (1995), socially complex resources such as trust, friendship, and reputation are more difficult to imitate

than capital-based resources and are likely to enhance performance. Through coopetition, a firm owns and has access to resources that are immobile, not readily bought nor sold in the factor markets and is likely to enjoy superior financial performance. Conversely, considering the costs and risks associated with coopetition, a firm with low coopetition performance (less strong and less harmonious coopetitive relationships), is likely to capture lower benefits from coopetition. Instead, since such relationships are likely to be characterised with low trusts, opportunism, conflicts, legal issues and other costs (Ritala and Hurmelinna-Laukkanen, 2009; Gnyawali and Park, 2009; Bouncken et al., 2015), low coopetition performance could erode financial performance.

Coopetition performance is therefore expected to be positively associated with financial performance as it allows a firm to have access to potentially valuable resources and opportunities such as market information, financial means and market entry relative to competitors. Indeed, because coopetition performance is a heterogeneous and immobile resource that is controlled by a firm, variations in financial performance of firms could be explained by the differences in the diversity of resources and capabilities that firms own and/or have access to as a result of the performance of their coopetitive relationships. Based on this discussion, and in following the resource based view of the firm, this study contends that coopetition performance is a firm specific resource associated with superior financial performance as it enables a firm to reduce costs and increase the benefits associated with coopetitive relationships. The key point to note is that a firm in coopetition is likely to record superior financial value on the basis of resources derived from successful interfirm relationships. Thus,

H5*: Coopetition performance is positively related to financial performance.*

3.3.6 Moderating effects of coopetition learning process

There is evidence in the alliance literature that both the learning process and interfirm management capability are critical antecedents to interfirm relationship success. Surprisingly, the literature is silent on the value of investing in both mechanisms concurrently. Yet, isolated resources or capabilities, may not be effective as single assets for performance but that their value arises in the way they interact with other resources, as complementarities, to affect performance (Xiong and Bharadwaj, 2011). Therefore, drawing from the contingency view and consistent with the resource complementarity notion, this study suggests that coopetition learning process is a complementary resource that can help boost the coopetition relationship success outcomes of coopetition capability. It could be that coopetition performance stems from a recombination of various resources and capabilities and, a firm's learning process that involves articulation, codification, sharing and internalisation of coopetition knowledge increases the potential to effectively manage coopetitive relationships. As posited by Zollo and Winter (2002), firms that make deliberate learning efforts to articulate, codify, share and internalise coopetition knowledge are able to enhance their capabilities (e.g., coopetition capability) by making associations between past actions, the effectiveness of those actions, and future actions and therefore succeed in coopetitive relationships.

On the other hand, firms with low internal firm learning processes are less likely to exchange coopetition management knowledge and so may not be very effective in their management of coopetitive relationships, a necessary ingredient for coopetition success. Research on knowledge transfer and organisation learning indicates that learning mechanisms of articulation, codification, sharing and internalization help firms to accumulate, use and extend their knowledge to improve processes and capabilities

(eg., Kale and Singh, 2007; Felicio et al., 2012; Bouncken and Fredrich, 2016). Thus, this study suggests that greater internal firm learning processes may enable firms to benefit more from higher levels of coopetition capability as it can aid in effective exchange of market wisdom and industry-wide insider intelligence on coopetitive relationships. Hence;

H6: *The positive effect of coopetition capability on coopetition performance is strengthened when levels of coopetition learning process are high.*

3.3.7 Moderating effects of institutional support

While the literature remains silent about the kind of external environment forces that may condition the coopetition capability-coopetition performance relationship, this study draws from the institutional theory to argue that the coopetition capability-coopetition performance relationship is contingent upon differential levels of institutional support available to a firm. To this end, the study expects that the effect of coopetition capability on coopetition performance will be strengthened when levels of institutional support are higher.. In situations of abundant institutional support for interfirm cooperation between market rivals, including institutional regimes that regulate industry behaviour and functional institutional infrastructure that is capable of adjudicating conflicts in interfirm cooperations, firms are more willing to share resources which may increase the performance outcomes of coopetition capability. Accordingly, it may be expected that in environments characterised by high levels of institutional support, firms are likely to use coopetitive relationships to exploit the ample resources and opportunities available in partnering firms and so the performance outcomes of coopetition capability are likely to be enhanced in such environments.

Conversely, under conditions of low institutional support, increases in coopetition capability may not produce a superior coopetition performance outcome in that a low institutional support may heighten mistrust among industry actors which may render

capabilities in managing cooperation with rivals less beneficial. Given the resource challenges that SMEs face, in situations with low institutional support firms are likely to be more careful and tight-fisted with the little resources that they may have and might not be very willing to invest in coopetition capability or even share their resources with their competitors. Furthermore, coopetitive partners in institutional environments with low support are more likely to act opportunistically and breach contract terms, ignore obligations, withhold information and other resources, which may result in the other partnering firms to cease contributing valuable resources and information toward the relationship or holding back to avoid being exploited (Lui et al., 2009).

However, as institutional support increases, firms also endeavour to achieve more productivity by partnering more with their competitors. This is to suggest that because there are few market resources and opportunities for firms to exploit via coopetitive relationships in environments characterised by low levels of institutional support, firms are unlikely to invest more in managing coopetitive relationships and this weakens coopetition performance. This logic is in line with Park et al. (2002) argument that in declining markets characterised by fewer opportunities, firms have difficulty acquiring resources through interfirm collaboration owing to unclear prospects of the market. As such, firms tend to become more concerned with securing their own independency than with creating (unnecessary) dependence on other firms. Hence, the study hypothesises that;

H7: *The positive effect of coopetition capability on coopetition performance is strengthened when levels of institutional support are high.*

3.4 Chapter summary

This chapter has discussed the four theories guiding the conceptual arguments developed for the proposed study. The study draws from the resource based view and dynamic capability to understand the conceptual domain, firm-specific drivers and performance outcomes of coopetition capability. On the other hand, the institutional theory informs the study how external institutional forces might drive coopetition capability. Moreover, the contingency theory provides insights into how external and firm specific factors might condition the performance outcomes of coopetition capability. A preliminary conceptual model which hypothesises the drivers i.e. managerial ties, coopetition learning processes (internal firm specific resource) and institutional support (external environment forces); boundary conditions (i.e. coopetition learning process and institutional support); and performance outcomes of coopetition capability (coopetition performance which leads to financial performance) is presented. Arguments for these relationships are also presented.

Chapter 4 : Research methodology

4.1 Introduction

This chapter discusses key methodological aspects, including philosophical foundations that form the basis of this study. The research design, research setting, procedures of sampling, data collection and analysis are all presented. The chapter also presents ways on how the study deals with research validity and reliability related concerns as well as method bias.

4.2 Research philosophical perspective

An exploration of philosophical perspectives is essential with particular reference to research methodology as it helps researchers to refine and specify the type of evidence to be gathered, the way in which the evidence is to be interpreted and how the evidence helps to answer the research questions posed (Winch, 2008). Additionally, an understanding of the research philosophy enables and assists researchers evaluate different methodologies and methods and avoid inappropriate use by identifying the limitations of particular approaches. In other words, although not always laid bare, a researcher's view of what knowledge is does not only guide their choices about what to study but also raises significant methodological implications (Johnson et al., 2007). Thus, it is imperative to understand the various philosophical perspectives that guide social scientists in their effort to develop knowledge about social phenomenon. In fact, Proctor (1998) submits that consistency between the aim of a research study, the research questions, the chosen methods, and the personal philosophy of the researcher is the essential underpinning and rationale for any research project. In the same vein, Clark (1998) also submits that research methods can be described, considered and classified at different levels, and that the philosophical level is the most basic. This is

due to the fact that there exists an interrelationship between ontological (what is the nature of reality), epistemological (what can be known), and methodological (how can researchers discover what they believe can be known) levels of enquiry (Scotland, 2012; Clark, 1998; Guba and Lincoln, 1994).

Until recently, social scientists have debated on the use of two opposing philosophical paradigms: positivism and constructionism (Tsai and Liu, 2005). Positivism is a deductive approach to developing knowledge which views reality as external and objective. Epistemologically, knowledge is only of significance if it is based on observations of the external reality (Easterby-Smith et al., 2012). Positivism assumes an independent relationship between the observer and the observed, and makes use of quantitative data collection and analysis techniques to identify regularities and/or make causal inferences (Tashakkori and Teddlie, 1998). At the other extreme, constructionism views reality as socially constructed and given meaning by people (Andrews, 2012). This ontological view assumes that "social phenomena and categories are not only produced through social interaction but also that they are in constant state of revision" (Bryman, 2012:33). Accordingly, it is assumed here that knowledge and truth are created based on how people make sense of the world especially through sharing their experiences with others (Craib, 1997). Since the objective is not to make law-like generalisations but to gain a deep understanding of social phenomena, constructionists employ exploratory qualitative methods.

Nonetheless, scholars (e.g., Benton and Craib, 2010; Saunders and Lewis, 2012; Johnson and Onwuegbuzie, 2004; Tashakkori and Teddlie, 2010; Creswell, 2014) now acknowledge that philosophically the qualitative and quantitative paradigms are not diverse or mutually incompatible as often conveyed and that staunch identification with

a particular paradigm may not be as accurate, or even useful an endeavour as past trends would indicate. Consequently, this has seen the introduction of the third view, the abductive pragmatism. Simply defined as "the class of research where the researcher mixes or combines quantitative and qualitative research techniques, methods, approaches, concepts or language into a single study" (Johnson and Onwuegbuzie, 2004:17), pragmatism is oriented towards solving practical problems in the real world as it entails conceptualising social problems that are observed, and based on the conceptualisations, formulating hypotheses and applying theory to justify and predict actions (Morgan, 2007; Benton and Craib, 2010). In following this view which considers truth to be 'what works', scholars are able to move back and forth between different approaches to theory using the inductive results from a qualitative approach as inputs to the deductive goals of a quantitative approach, and vice versa (Benton and Craib, 2010).

4.2.1 Philosophical perspective for this study

Due to the complexity nature of and the present state of knowledge on coopetition capability, the pragmatism-mixed method approach design guides this study. The fact that there is a dearth of research on coopetition capability in SMEs in developing economies, the initial phase of the study aimed at gaining a deeper understanding of the coopetition phenomenon, was guided by the constructionism-qualitative approach. Highly interactive interviews, to allow answers to complex questions on coopetition capability, characterised this phase of the study. On the other hand, the positivism-quantitative approach informs the second phase of the study with an aim to validate and/or invalidate observations made in the qualitative phase and to make law-like generalisations of the findings to other populations. By so doing, this study benefits from the use of a variety of data sources, multiple methods to study a research problem and multiple perspectives to interpret the results. In fact, the adoption of the pragmatic

approach is consistent with recommendations by Stevens in Tashakkori and Teddlie (2003) and Greene (2006) that complex and multiplex social phenomena demand mixed investigative tools. However, it should be noted that although both perspectives are used, the study principally employs a quantitative methodological approach to data collection and analysis.

4.3 Research context and setting

In contrast to most interfirm relationship research which has occurred largely in the context of developed economies, this study has Zambia, a developing economy in Sub-Saharan Africa, as the main context in which to study the nature and dynamics of the coopetition phenomenon for a variety of reasons. First, studying coopetition in the context of a developing economy is a timely response to appeals (e.g., Hoskisson et al., 2000; Wright et al., 2005; Mesquita and Lazzarini, 2008) to strategy researchers to embrace developments in other regional settings to advance the development of theory and practice. Indeed, while coopetition studies in the context of developed economies relatively abound, the dearth of coopetition research in the context of developing economies has denied researchers of thorough theoretical and empirical understanding of the coopetition dynamics in such economies. Clearly, because of the institutional, political and economic differences between developed and developing economies, strategy theories promulgated for developed market economies may not be appropriate for developing economies. Thus, exploring the coopetition capability phenomenon and understanding how and why it emerges, its impact on performance in the context of developing economies provides new theoretical and empirical insights into the strategy literature.

Second, Zambia has in the recent past experienced robust economic growth and capital inflows, and like many other developing economies, the country is implementing the International Monetary Fund/World Bank's recommended structural adjustments programs that include monetary and banking reforms, privatisation of state-owned enterprises and removal of import and foreign exchange restrictions (World Bank, 2013). This has inevitably shaped managerial assumptions and decision making processes of many firms, including decisions regarding how to cooperate with other firms in order to effectively and efficiently create and deliver customer value. As such, Zambia makes useful case scenario to investigate the dynamics of the coopetition phenomenon in the context of developing economies, satisfying Hoskisson et al's (2000) two criteria for defining developing economies, which are; "a rapid pace of economic development, and government policies favouring economic liberalisation and the adoption of a free-market system" (p. 249). Third, because of the presence of strong collectivistic cultures in most developing economies, gaining competitive advantage through network relationships and ties with market and/or non-market players is an important focus of firms in these economies (Acquaah, 2007). As such, coopetition takes on instrumental relevance in such economies.

The choice of the SMEs context is based on the fact that in spite of the successes of reducing business failure rates in recent years, many SMEs are still burdened with severe resource limitations and institutional challenges that threaten their competitiveness. To this end, scholars (e.g., Morris et al., 2007; Gnyawali and Park, 2009; Bouncken and Kraus, 2013) have suggested that coopetition plays an important role in enhancing the performance of SMEs. However, a review of the empirical coopetition literature reveals inconsistencies regarding the relationship between coopetition and performance, especially in SMEs. The fact that many Sub-Saharan

African economies are dominated by activities of SMEs that are severely burdened with resource limitations and institutional challenges that threaten their competitiveness and survival, studying coopetition in SMEs located in Sub-Sahara Africa should provide useful insights into how coopetition capability help enhance SMEs' competitive positions.

4.4 Research design

A research design is defined as a detailed blueprint of how, when and where the data are to be collected and analysed (Malhotra et al., 2013). It is considered to be an important methodological decision as it not only influences the success of a project but also ensures that the evidence collected is suitable for theory testing. Therefore, having the research problem defined, research objectives clearly stated (chapter one) and hypotheses developed (chapter 3), it is important to explain how the research objectives and hypotheses are going to be tested.

The social sciences literature identifies three broad types of research designs: exploratory, descriptive and causal (Churchill, 1996; Malhotra et al., 2013; Creswell, 2014). The three differ in terms of research purpose, research questions, precision of the hypotheses and data collection methods (Aaker, 2011). For example, while exploratory research is essentially intended to provide initial ideas and insights into the general nature of a problem, the possible decision alternatives, and relevant variables that need to be examined; descriptive research is typically focussed on describing the frequency of occurrence of a phenomenon or the nature of the relationship between variables (Churchill, 1999). Causal on the other hand is concerned with examining cause-and-effect relationships between variables (Churchill, 1999).

This study employed exploratory and descriptive research designs. Since relatively little is known regarding the drivers and performance outcomes of coopetition capability in SMEs in Zambia, exploratory research was used as an initial platform for gaining an understanding of the research setting and of the study constructs and their applicability. Indeed, the exploratory study provided useful insights into the research problem, formulation of the hypothesised relationships and identification of key informants. Descriptive research was thereafter deployed to collect the data needed to examine associations among drivers, boundary conditions and performance outcomes of coopetition capability. The fact that the researcher was not able to manipulate the variables studied in order to establish cause-and-effect relationships rendered causal research design unsuitable.

4.4.1 Research design for this study

Having settled on exploratory and descriptive research, there was need to determine the type of descriptive research that was best for the study. A decision had to therefore be made between the two predominant types of descriptive research studies: cross sectional and longitudinal, identified in the literature (Churchill and Iacobucci, 2005; Malhotra, 2012). A cross-sectional study involves the collection of data on more than one case at a defined point in time. The aim is to gather a body of data, both quantitative and qualitative, from a pool of participants with varied characteristics and demographics at a specific point in time (Bryman and Bell, 2015). Cross sectional studies are popular among marketing academics and practitioners as they allow for inferences to be made from large samples in a cheaper and faster way (Rindfleisch et al., 2008; Churchill and Iacobucci, 2005).

In contrast, longitudinal studies involve the collection of data from the same panel of participants over long periods of time. Basically, longitudinal studies observe and

compare variables from a specific sample at different points in time in order to enhance understanding of the variables and examine developments or changes in the variables over time (Churchill and Iacobucci, 2005). While longitudinal studies ensure high accuracy when it comes to observation of changes as they can show change patterns over time, they tend to suffer from panel attrition and lack proper guidelines on when to conduct further waves of data collection (Rindfleisch et al., 2008). The great amount of time and financial resources needed to effectively collect data also pose a huge challenge in longitudinal studies.

In view of these limitations of longitudinal studies, especially of the ones that concern time and financial resources, cross-sectional research design was adopted as best suitable for the study. Although cross sectional surveys are said to be prone to common method bias and limited in their degree of casual inferences, cross sectional survey studies remain popular in marketing research because of their ability to collect data on a wide range of variables from a representative sample of the population of interest in a more efficient manner. Indeed, this being a doctoral research with a strict deadline and limited budgets, a longitudinal study was a less realistic and practical option.

In addition, the fact that the aim of the study is not to detect changes in variables over time but to examine relationships between variables rendered the longitudinal design, which is best for studying trends in pattern over time, less desirable. Moreover, the study employed some of the suggestions by methodologists to minimise the threat of common method variance bias. Chapter 6 presents a detailed discussion on this. In the sections that follow next, a discussion on the two phases of data collection techniques for the study is provided, beginning with a discussion on field interviews.

4.5 Data collection techniques

4.5.1 Phase 1 - exploratory interviews

A series of in-depth interviews aimed at gaining an understanding of coopetition in SMEs was conducted with 15 managers by the researcher. Appendices 4Aii and 4Aiii present details of the companies interviewed and word list for content analysis on the study constructs, respectively. The interviews were primarily conducted to verify the applicability and relevance of the constructs included in the conceptual framework as well as to identify suitable indicators for measuring each of the constructs. Further, the interviews were used to examine the hypothesized linkages between the constructs and to explore the structure of the proposed conceptual model.

To ensure accuracy and consistency of findings, a semi-structured interview guide was developed and closely followed during the field study (see appendix 4Ai). Essentially, this tool was developed under the continuous guidance of three principal research advisors and was pre-tested among two of the researcher's senior PhD colleagues to determine the likely length of the interview, to check that the questions are likely to be understood and that they are not leading or offending the respondents.

During the field interviews, respondents were encouraged to explicate their answers and to be free to ask questions so as to bring more clarity to the discussions. The interviews begun with an introduction to the study, an explanation of its objectives, scope and importance with a view to creating awareness of the study and to addressing potential concerns about the information sought from the respondents. Informants were then asked to describe how they managed their firms' relationships with competitors, the motivating factors and the outcomes of their management efforts. For each

informant interviewed, it was of paramount importance to ensure that the informants were individuals not only with a broad view of their firms' interfirm engagements, but also who were responsible for the firm's management of coopetitive relationships. Such individuals included chief executive officers, key accounts managers, key account coordinators and corporate relations managers. The actual interviews lasted between 60 minutes and 120 minutes.

Insights from the interviews served as input to the second phase of the study by informing the development of a survey instrument. Appropriate adjustments to the model was also made based on the interview insights. After data collection was completed, the data was transcribed within 24 hours of their occurrence to preserve the quality of information. The interview transcripts were then read through and analysed to generate themes of the dimensions, drivers and outcomes of coopetition capability. This involved identifying commonalities and differences across respondents and highlighting the themes that emerged from each interview. Accordingly, quotes from different interviews that related to a particular theme were recorded. Through an iterative process of going back and forth through the collected data and gathering descriptive codes by comparing the informant responses (Hsieh and Shannon, 2005), the coopetition capability dimensions were narrowed into five themes: interfirm coopetition coordination, coopetition portfolio coordination, coopetition learning, coopetition proactiveness and coopetition transformation. In terms of the drivers, two broad themes emerged: external environment drivers and internal firm specific factors. Additionally, relationship success, coined coopetition performance in this study, emerged as a direct outcome of coopetition capability which subsequently improved financial performance.

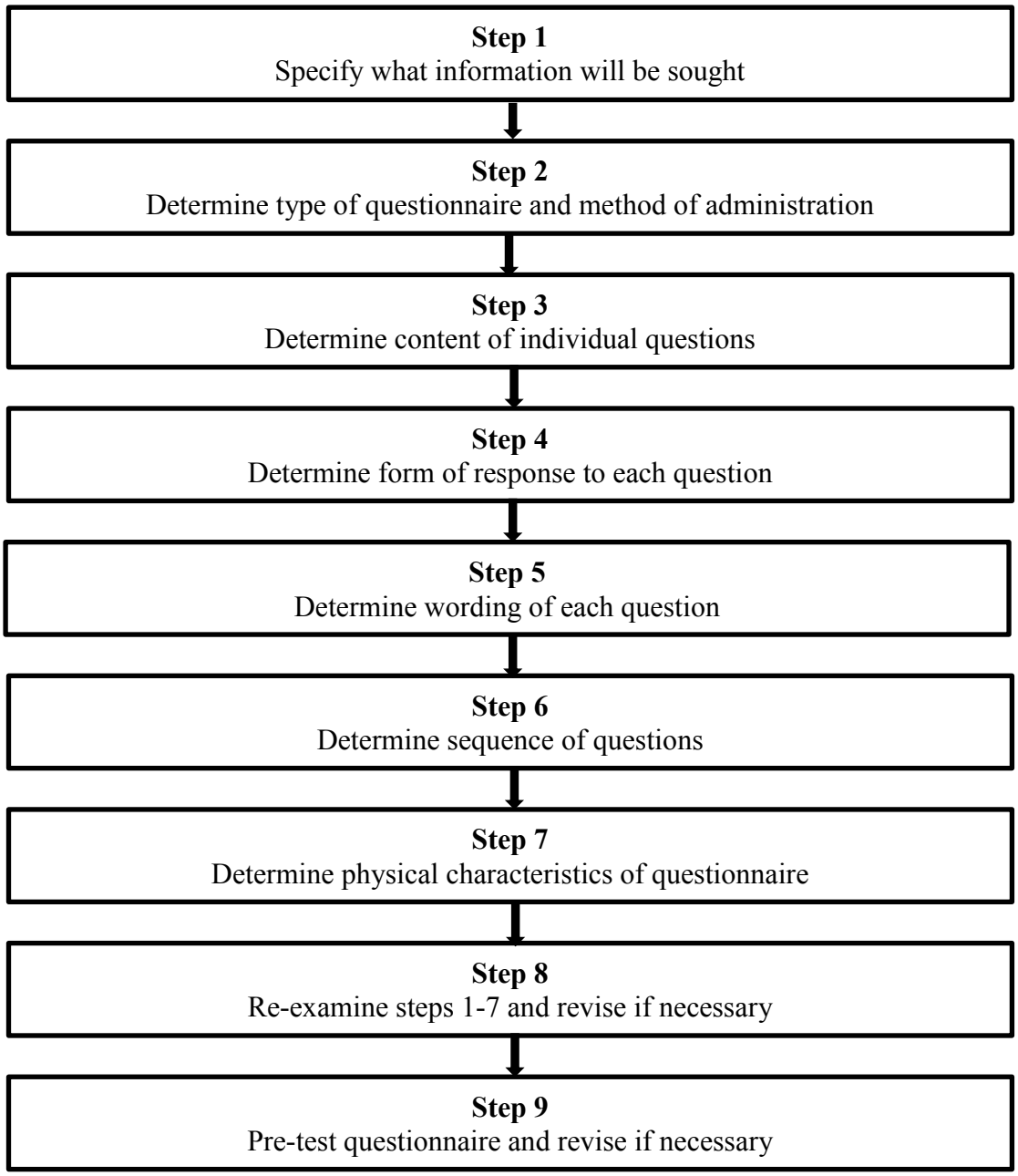
4.5.2 Phase 2 - Questionnaire-based survey

With rich insights from the qualitative study, it was necessary to proceed to Phase 2, the large scale survey-based study, to explore further the coopetition phenomenon. The primary aim of the survey-based was to provide superior evidence for a conclusion on the study's proposed conceptual model developed from a review of the extant literature and preliminary results of the qualitative study. The survey which forms the main platform for gathering data, was also necessary to validate and/or invalidate observations made in the exploratory phase and to make generalizations of the findings to other populations. To this effect, a questionnaire, defined as "a structured technique for data collection that consists of a series of questions, written or verbal, that a respondent answers" (Malhotra, 2004: 280), appropriate for this study was developed drawing its inputs from the first phase (exploratory interviews) of the study. In the sections that follow next, a detailed description of the questionnaire design process recommended by Churchill (1979) that was followed in this study is given.

4.6 Questionnaire design process

Designing a questionnaire that effectively accomplishes the data collection purpose and avoids common data collection errors such as sampling error, measurement error and non-response error is one of the most challenging tasks social scientists using the survey approach to collect data must undertake. Hence, in following Churchill's (1979) questionnaire design procedure, careful attention was paid when designing the questionnaire for this study so as to ensure that the instrument adequately covered the relevant variables and that the instrument was appropriate for the targeted audience. Figure 4.1 below presents a step by step guide into the design of a questionnaire. Although the guide provides useful insights into the development of a questionnaire it should not be taken too literally.

Figure 4.1 :Questionnaire Development Procedure



Adopted from Churchill (1979)

4.6.1 Type of information sought

A careful analysis of the type of information sought was conducted. Guided by the objectives of the study and the conceptual model developed, a review of the relevant literature was conducted in search of existing measures of coopetition capability. However, considering the fact that the coopetition phenomenon is a new concept and not much on the construct has been done, appropriate measures were non-existent. It

was therefore necessary at this juncture to further search the broader interfirm relationships literature for measures that could be adapted to suit as measures for the purpose and context of this study.

More specifically, the scale-search task began by looking at existing scales that measured the dimensions of alliance management capability, with coopetition capability in mind. The measures were adapted to fit the definitions developed in chapters two and three. The same scale-search task through a review of relevant literature was done for all other constructs in the model. Moreover, as earlier stated, exploratory face-to-face interviews were conducted with SME managers in Zambia to gain a deeper understanding of the constructs and to capture the constructs in the words of the managers in order to incorporate their understanding of the constructs in the questionnaire's scale items. Table 4.1 provides a summary of the type of information sought from the respondents. This is then followed by a discussion on how the constructs are finally operationalised in this study.

Table 4.1 : Type of information sought from respondents

Main construct 1. Coopetition capability
Criterion variables 1. Coopetition performance 2. Financial performance
Drivers 1. Managerial ties 2. Coopetition learning process 3. Institutional support
Contingencies 1. Coopetition learning process 2. Institutional support
Controls 1. Firm age 2. Firm size 3. Coopetition experience 4. Cooperation with other market players 5. Coopetition structure

4.6.1.1 Operationalisation of study constructs

This section discusses how study constructs were operationalised. Appendix 4Bi exhibits details of the items used while a brief discussion on the measures is presented below.

4.6.1.2 Coopetition capability

In developing measures of coopetition capability, the researcher adapted from Schilke and Goerzen's (2010) scale of alliance management capability. Defined as a firm's ability to manage a portfolio of its cooperative relationships with competitors, the coopetition capability scale is conceptualised as a second-order, five-dimensional construct consisting of:

1. *Coopetition interfirm coordination*, a five item construct which pertains to the governance of individual coopetitive relationships.
2. *Coopetition portfolio coordination* relates to the integration of the firm's various coopetitive relationships and four items captured this construct.
3. *Coopetition learning* refers to routines designed to facilitate knowledge transfers across organisational boundaries and was captured by six items.
4. *Coopetition proactiveness* is defined as routine efforts to identify potentially valuable partnering opportunities. The scale consists of six items.
5. *Coopetition transformation* relates to routines to modify coopetitive relationships over the course of the coopetition process and was measured by four items.

All the items for the five dimensions of coopetition capability were measured on a seven-point Likert-type scale, anchored at 1 = "strongly disagree" and 7 = "strongly agree". The items were revised where necessary to reflect interviewees articulation of how they manage cooperative relationships with competitors.

4.6.1.3 Coopetition performance

This study draws from the alliance literature (e.g., Schilke and Goerzen, 2010; Kale and Singh, 2007; Christoffersen et al., 2014; Franco and Haase, 2015) to define coopetition performance as a firm's success with coopetitive relationships. Although the alliance literature provides various measures of performance including objective (e.g., stability and accounting) and subjective measures, conceptualisation of interfirm relationship performance remains inconsistent and ambiguous in the literature (Robson et al., 2002). This, notwithstanding, subjective measures adapted from Kale and Singh (2007) were used to measure coopetition performance because of a number of reasons. First, the use of subjective measures is recommended in the interfirm relationship literature because it does not only provide a consistent and uniform way to measure performance across a large sample of interfirm relations but also because there is evidence for a positive correlation between interfirm relationship performance assessments based on this measure, with other objective measures that use accounting or financial data (Geringer and Hebert, 1991). For example, Geringer and Hebert (1991) found high correlation between stability measures and subjective performance measures, indicating that different performance measures are interchangeable. Second, as Kauser and Shaw (2004) submit, it is extremely difficult to obtain reliable objective data of interfirm relationship outcomes. In fact, the exploratory interviews revealed that managers had difficulty in disclosing objective coopetition performance data as there is no provision for coopetition performance in the formal financial reports of the companies. Moreover, a more recent comprehensive review conducted by Christoffersen et al. (2014) reveals that subjective performance measures are the most frequently used measure of performance.

In the questionnaire, respondents were asked to indicate the extent to which their partnerships with competitors were harmonious ,and the extent to which their firm achieved its objective in forming the partnerships. A seven-point Liker-typet scale ranging from strongly disagree (1) to strongly agree (7) was used to capture respondents' perception of the four indicants of the construct incorporating inputs from field interviews which indicated relationship success as a critical outcome of effective management of coopetitive relationships.

4.6.1.4 Financial Performance

Both objective and subjective measures of financial performance were included in the questionnaire in line with insights from the field interviews which pointed to financial success as an outcome of successful relationships with competitors. However, informed by Geringer and Hebert's (1991) recommendation that measures of performance can be used interchangeably especially in cases where there is high correlation of the measures, objective measures were used in the analysis. To obtain an objective measure of financial performance, respondents were asked to indicate the annual sales and profit for the previous year. This more objective measure was significantly related to the subjective measure of financial performance ($r = 0.68$; $p < .01$).

4.6.1.5 Managerial ties

Managerial ties captured the extent to which a manager of a focal firm had connections with managers or employees of other firms including governmental and industry bodies (Luo, 2003). Shane and Cable's (2002) four item scale, also used by Boso et al. (2013), was adapted and used in this study. The scale was anchored on a seven-point Likert-type scale ranging from 1 = not at all to 7 = to an extreme extent.

4.6.1.6 Coopetition learning process

Following Kale and Singh (2007) coopetition learning process was conceptualised as a four-dimensional construct consisting of: coopetition knowledge articulation,

coopetition knowledge codification, coopetition knowledge sharing and coopetition knowledge internalisation. Multi-item scales adapted from Kale and Singh (2007) anchored on a seven-point Likert-type scale with 1 = strongly disagree and 7 = strongly agree were used to measure each of the four dimensions (six items for articulation and sharing, and four items for codification and internalisation).

4.6.1.7 Institutional support

Institutional support in this study refers to managers' perception of the extent to which government and its agency provide support for their business activities. Such support includes financial, technical, information, raw materials and equipment. The measure was adapted from Li and Atuahene-Gima (2001) and included six items tapping the managers' perception of the extent to which the government and its agency provided support firms consider critical for the successful operations of firms in the industry. These were anchored on a seven-point Likert-type scale with (1) being strongly disagree and (7) being strongly agree.

4.6.1.8 Control variables

In line with previous studies, it seemed prudent to control for five factors: firm size, firm age, firm coopetition experience, collaboration with other market players, and coopetition structure that have the potential to influence the performance outcomes of coopetition capability (e.g., Schilke, 2014a; Schilke and Goerzen, 2010; Ritala, 2012; Kale and Singh 2007; Oum et al., 2004). In terms of firm size, larger firms are more likely to dominate markets and gain competitive advantage due to economies of scale and resource sufficiency (Oum et al., 2004). As such, firm size is likely to influence the performance outcomes of coopetition capability. Firm age is also considered to be a determinant of performance because while older firms are more experienced and are associated with first mover advantages; young firms have a higher failure rate due to liabilities of newness (Kirca et al., 2011). Therefore, firm age is controlled for in order

to mitigate the effects of a firm's establishment in an industry over time which is likely to affect performance (Ritala, 2012). In addition, firms with extensive coopetition experience have general knowledge about coopetitive relationships, which can be valuable and contribute to a firm's capability to effectively manage and benefit from coopetitive relationships. The same holds true for coopetition structure and collaboration with other market players.

In terms of the measures, Firm size was measured by the total number of full-time employees while firm age was measured by the total number of years a firm has been in business (Schreiner et al., 2009; Boso et al., 2013). Coopetition experience was measured by total number of years a firm had been cooperating with competitors. A natural logarithm transformation was taken for the three variables. Multi item indicators adapted from the literature were used to capture coopetition structure and collaboration with other market players (Schilke and Goerzen, 2010; Li and Zhang, 2007; Lau and Bruton, 2011).

4.6.1.9 Profiling variables

Besides the variables in the conceptual model, six questions were included for the purpose of profiling the organisations that were sampled for the study. In fact three of these profiling variables (firm size, firm experience and coopetition experience) are control variables as earlier discussed. Figure 4.2 exhibits the variables.

Figure 4.2 : Profiling Questions

1. In what industry does your company operate?
2. How many years has your company been in this business?
3. How many full-time employees does your company have?
4. How many partnerships with competitors is your company involved in at present?
5. For how long has your company been cooperating with competitors?
6. **Please choose the areas in which you cooperate with your competitors. (please tick)**
   Equipment and technical support; Financial support; Employee training; Subcontracting; Tender submission; Supply of raw materials; Joint advertising; Joint product distribution; Information sharing; Other (please specify)……

4.6.1.10 Other variables

Besides the variables used in this study, other variables were included in the questionnaire for purposes of future research outside the objectives of the present study. Specifically three sets of questions to capture the task environment were included. In addition, questions measuring different aspects of firm performance, namely; customer, strategic, sales and profitability were also included.

4.6.2 Type of questionnaire

Having specified the type of information sought, a decision had to be made regarding how the information was to be gathered. It was decided that the questionnaire be structured to reduce the amount of thinking that respondents needed to undertake to complete it, thereby have higher response and more accurate data. Furthermore, a structured questionnaire with multiple responses from which respondents could pick what best suited their opinion was favoured to make it easy to code and analyse the responses and come up with more accurate generalisation of the findings.

4.6.3 Question wording

Determining wording of each question is a critical task when developing a questionnaire. This is because the way questions are phrased may determine whether respondents understand the question and so are able to answer the question correctly (Churchill, 1996). Respondents may refuse to answer a question they don't understand due to poor phrasing. This may result into item non-response which can cause problems in analysing the data and/or cause measurement error as the recorded response may not reflect the respondent's true position on the issue at hand. In short, question wording is of critical importance as it can directly affect the response to it.

Accordingly, care was taken when framing the questions. Firstly, simple words that the respondents could understand were used. Given that the investigator hails from Zambia,

and has an understanding of the appropriate vocabulary used by managers in that country, common and simple words were used. Also, it was established during the pilot phase of the study that respondents were not comfortable with some terms in the questionnaire. For example, partnership was used in place of alliance, company in place of firm, cooperation with competitors instead of coopetition. In addition, ambiguous words such as never, often and sometimes were avoided in the questionnaire as they might hold different meanings to different respondents. It was also important that the questions were clearly understood by the respondent, and to this end, effort was devoted to make the wording of the questions as simple and to the point as possible to suit the needs of the research context.

The investigator also made it a point to follow scholarly recommendation (e.g., Churchill and Iacobucci, 2005) not to include leading questions in the questionnaire. Furthermore, instead of calling for two responses in one question, questions were split into two separate ones to avoid confusing the respondents.

Although Zambia boasts of over 73 languages spoken, the questionnaire was developed in English for the reason being that it is the official language in Zambia. Therefore, respondents were adequately proficient in it as it is the means of classroom instruction and official communication.

4.6.4 Question sequencing

In designing a questionnaire, scholars (e.g., Malhotra et al., 2013; Malhotra, 2006; Churchill and Iacobucci, 2005) recommend that questions should be arranged in logical order and around thematic topics. To this end, two question sequencing options, the funnel approach which involves asking broad and general questions followed by more specific and tougher questions, and the inverted funnel approach which is the opposite

of the funnel approach are provided in the literature (Churchill and Iacobucci, 2005; Malhotra, 2006). This study followed the funnel approach where the questionnaire started with simple, general, and less taxing questions so as to stimulate the interest of the participants. Specifically, the questions on the respondents' perception on the environment were asked first followed by questions on coopetition capability. Difficult and sensitive questions such as those on performance were placed later in the sequence. The questionnaire ended with less tasking profiling questions on the firm and the respondents. This sequence is recommended by researchers as respondents may feel put-off, threated and are even likely to refuse to complete the questionnaire if too difficult or personal questions are asked at the start (Malhotra, 2006). Another reason why this strategy is recommended is because of the fact that not all respondents fully complete questionnaires. Therefore, by putting the most important items near the beginning, right after the general question items, partially completed questionnaires may still contain important information.

It should be noted that the same questions were asked of each respondent in the same order and respondents were free to answer in their own time and not necessarily in the presence of the researcher. In this case, the respondent had to advise when it would be appropriate to collect back the completed questionnaire. Also, an introduction for each thematic set of questions as well as simple instructions on how to complete the questions were given. For example, in section E of the questionnaire, the following introduction was given: 'This section seeks your overall assessment of the performance of your company's partnerships with its competitors. Please circle a number to indicate the extent to which you agree with the following statements…' This was important in that it helped respondents switch their line of thought as they progressed from one thematic set of questions to the other. Furthermore, considering the fact that all SMEs

irrespective of whether they cooperate or not with competitors were targeted, a branching question was used to direct respondents to different places in the questionnaire based on their response to the 'sifting' question. So, an instruction was given: 'Does your company cooperate with some of its competitors? (Please tick) Yes/No. If your answer is No, go to section F on page 7. If yes, please answer the following questions…'

4.6.5 Response format

While a host of answer formats are available in questionnaire based survey research, such as open-ended answers, multi-dichotomous answers, dichotomous answers, and closed-ended, the closed-ended answer format was adopted in this study for a variety of reasons. Firstly, because the closed-ended format provides respondents with choices from which they may choose the answer that best reflects their opinion (Malhotra et al., 2013), it was considered the best option for the purpose of more objective responses and the planned quantitative analysis in this study. Secondly, this fixed alternatives format was deemed to be more appropriate for comparing responses across multiple respondents. As Burns and Bush (2000) advise, closed ended answer format makes it possible and easy to compute descriptive statistics such as frequencies, means and standard deviations. Thirdly, the closed-ended answer format questionnaire tend to record higher response rate than open-ended because it minimises respondents' effort of thinking about the best answer to give but they can easily pick the choice with minimal thinking effort and time (DeVellis, 1991).

Thus, for most of the questions, respondents were asked to circle or tick, indicating their choice that best applied to them from a given number of options. The study mostly relied on seven-point Likert-type scales which provides a good balance between having enough points of discrimination and having enough response options (Nunnally,

1978). However, it should be mentioned that the questionnaire also contained some open-ended questions which required respondents to fill boxes in with appropriate values, such as those on company experience and number of full time employees.

4.6.6 Physical characteristics of questionnaire

Regarding the layout and physical characteristics of the survey questionnaire, the researcher made it a point that the instrument looked professional to reflect its significance and to encourage respondents to participate. A cover page with a picture of two people greeting each other (reflecting cooperation) was developed. Then a cover letter with an introductory section introducing the research to the respondents and explaining the objectives and significance of the study was prepared. The letter stated the sponsors of the study. A promise of confidentiality was also made in the letter as well as a provision for the respondents' consent. Further the cover letter had information and contact details of the project leaders and the investigator's signature was appended.

An attempt was made to keep the length of the questionnaire to a reasonable and practical level. The questionnaire was divided into different sections with an introduction for each section. The thematic were shaded in grey to show a difference in the themes and instructions in bold to minimise difficulty and confusion in answering the questions. The investigator also made sure that the questionnaire was not crowded to discourage or stress the respondents. This led a total number of pages of the questionnaire to eight (8). See Appendix 4Bii for the questionnaire that was developed for this study and Appendix 4D for the study's ethical approval from the University of Leeds.

4.7 Pre-testing

Once developed, the questionnaire went through a rigorous review phase. To start with, three principal research advisors with experience in developing survey questionnaires were asked to go through and comment on the clarity of the instructions and overall format of the instrument. The investigator also had an opportunity to get comments on how to improve the questionnaire from three senior PhD colleagues who had gone through questionnaire development and were at a stage of either analysing their data or close to completing their doctoral studies. Furthermore, two academic researchers in Zambia, the setting for the study, were asked to review the quality, quantity and clarity of the questionnaire. Several insightful and helpful suggestions on how to improve the questionnaire were given and the investigator modified the questionnaire accordingly.

The revised version was then pilot tested in ten interviews with SME managers in Zambia to examine how well the items reflected the constructs being measured. This also gave a picture of the extent to which the constructs were understood and the extent to which their interpretations were shared across respondents. Furthermore, this allowed the researcher to familiarise herself with potential issues that would arise during the actual survey, including vocabulary.

4.8 Survey administration

With regard method of administration, a critical evaluation of the available methods, namely; mail, telephone, online survey, telephone and personal interviews was conducted in terms of their capabilities and limitations as well as the culture and infrastructure of the country where the study was being done, what would be more efficient and effective as regard achieving a high response rate. Consequently, the door to door personal interviews emerged to be the most appropriate method to meet the

needs of this research. Telephone interviews and mail were not suitable considering that the researcher did not have the contact details of the respondents but relied on a door-to-door approach of identifying them. In addition, although the telephone interview would have been the fastest, it would have been more costly considering the length of the questionnaire while the mail would have been the slowest with the highest non-response rate, considering the level of efficiency of the postal services in Zambia. However, it should be noted that the telephone method was effective for completing those questionnaires which had missing data and for verifying the responses after data collection was completed. It should also be noted that a web based survey was created for the study but considering the infrastructural development and low internet use rates in Zambia, this was not used.

Thus, although expensive and time-consuming, especially when the sample is geographically dispersed as it involves travelling between respondents, personal face to face interviews proved to be the most effective method for collecting data. In addition, personal interviews were favoured because as Saunders and Lewis (2012) submit, the presence of the interviewer tends to generate empathy and interest in the research on the part of the respondent, resulting in high response rates. In terms of the fieldwork personnel, the researcher selected based on academic performance, five research assistants from among the final year undergraduate students at the Copperbelt University. These had to undergo training, before fieldwork had commenced, to ensure the questionnaire is administered in the same manner and that the data is collected uniformly. The objectives and purpose of the study were explained to the assistants during the training, which covered how to make an initial contact, asking questions, probing and recording the answers.

4.9 Response rate enhancement

A number of strategies were employed to motivate informants to complete the questionnaire. To start with, respondents were thanked for agreeing to participate in the study. This was followed by an explanation of the potential benefits of the study given the increasing dynamism and complexity of today's business world. An appeal was then made about how valuable their response was to the success of the study. In addition, the three sponsors of the project (Commonwealth Scholarship, Copperbelt University and University of Leeds) were highlighted in line with recommendation by methodology scholars that sponsoring institutions should be highlighted to boost credibility.

Furthermore, clear and self-explanatory instructions were provided to make it easy for the respondents to complete the questionnaire and reduce the time taken to complete it. To encourage participation, a summary of the findings was offered to the respondents at the end of the questionnaire; respondents were asked to tick and provide an address to which a summary of the results would be sent if interested in the results. Moreover, the researcher's contact details (email address, and telephone numbers for the United Kingdom and Zambia) were provided on the cover page. This not only served as a platform for asking questions when unclear but also gave respondents confidence of the authenticity of the study, and increased their willingness to participate in the study. Finally, the face-to-face approach of administering the questionnaire also proved helpful in enhancing the response rate as respondents were more willing to complete a questionnaire with a researcher in form of an interview than leaving it for them to complete at their own convenient time.

4.10 Sampling procedure

While studies on the whole population generally offer more accurate and reliable results, it is impossible at times to collect or analyse all the data available in a population due to a variety of reasons. For example, the fact that most research projects are time bound with budget constraints, renders collecting data from the whole population which requires a lot of time and financial resources not feasible. Even when time and financial resources are not a constraint, it may be impractical to collect data from a population as some places may not be accessible and/or some members of the population be not be available to participate in the study. In fact, some scholars argue that a sample might provide more useful and reliable results than a census if well planned (e.g., Churchill and Iacubucci, 2006; Zikmund et al., 2013). This is because researchers have to deal with large numbers when conducting an investigation on a population and as such, there is a high likelihood of making errors.

In this study, a sample investigation was deemed more appropriate mainly due to time and financial constraints, as it is a PhD research expected to be completed within a specified period of time. Also, considering the fact that the population for companies cooperating with their competitors in Zambia is unknown (as there are no records indicating this statistic), collecting data from a sample was more practical. However, it should be noted that effort was made to ensure that the sample was representative enough to allow for generalisation of results about the underlying population.

The unit of analysis of this study is all registered SMEs that cooperate with their competitors in Zambia. Thus, because the primary aim of the study was to examine

coopetition capability, all SMEs in Zambia irrespective of industry, size, or core business, engaged in cooperation with competitors form the population of the study.

4.10.1 Sampling design

In terms of the sampling frame, the study relied upon SMEs' registers provided by the Zambia Chamber of Small and Medium Business Association, in charge of small and medium business operations in Zambia. It was however difficult to establish the sampling frame for this study as the records provided did not have reasonably detailed and dependable information on the SMEs. For example, most of the contact details of the firms turned out to be dated, confirming Kriauciunas et al's (2011) submission that unlike in developed economies with established industry players, developing sampling frames is a challenge in most developing economies as industry players are emerging and there exists an absence of established databases. To this effect, they recommend that sampling frame development should be context specific. Within the confines of this study, a combination of purposive and snowball non-probability sampling techniques were employed to identify and select the sample. Purposive sampling, based on the researcher's judgement (Churchill, 1996) was used in identifying key informants, based on the official list provided, defined here as those SMEs who are both knowledgeable of coopetition and are willing to report on the phenomenon. Snowballing approach, whereby initial respondents were relied upon to identify other potential respondents, was also useful (Saunders and Lewis, 2012). In fact snowballing proved to be very effective in this study as most of the respondents were more willing to participate in the study when told that they had been endorsed by a colleague or business partner or trusted authority.

4.10.2 Sample size

A total of 750 questionnaires were distributed. Out of these 506 were completed and collected. However, a total of 221 were removed from the sample as respondents had

answered ‘no’ to the sifting question: Does your company cooperate with some of its competitors. This indicated that the companies did not engage in coopetition and so could not be part of the sample. After eliminating surveys with excessive missing data, 254 usable responses were recorded as shown in table 4.2.

Table 4.2 : Usable questionnaires

Total questionnaires sent out		750
Not returned/collected	244	
Collected		506
Firms that do not coopete	221	
Coopetition sample		285
Missing data/ non useable	31	
Useable		**254**

Going by Churchill’s (1996) definition of number of completed interviews with informants divided by the number of eligible informants in the sample, 86% ([254/285]100) is the effective response rate for this study based on the companies that coopete. The useable response rate is impressive and confirms Saunders and Lewis’ (2012) argument that the face-to-face approach is usually associated with high response rates. The response rate is not only comparable to previous SME research studies (e.g., Hoffman and Schlosser, 2001; Zeng et al., 2010; Runyan et al., 2012) but also in line with the literature on survey-based research (e.g., Hair et al., 2010) which recommends a sample size ranging between 200 and 400 for the purposes of structural equation modelling. A detailed description of the characteristics of the firms in the final sample is provided in chapter 5.

4.11 Characteristics of informants

The study targeted managers who were explicitly responsible for the respective firm's coopetition management operations. The respondents were mostly senior level executives with 26% CEO, 47% senior managers, and 27% others (eg., head of unit). The respondents on average had seven (7) years of experience with their current firms. To enhance quality of the responses, informants' self-reported knowledge of the firm's coopetition activities was assessed on seven-point answer scales ranging from 1= strongly disagree to 7 = strongly agree. The means of 5.85 (SD = 1.07), 6.01 (SD = 1.01) and 6.04 (SD = 1.03) respectively, suggested that informants were very well informed and knowledgeable. Table 4.3 below gives the characteristics of the informants

Table 4.3: Characteristics of informants

Position of respondent	**Frequency**	**Percentage**
CEO	66	26
Senior manager	119	47
Others	69	27
Tenure of respondent in current firm (years)		
< 3	33	13
3-4	55	21.7
5-9	100	39.4
10-14	41	16.1
≥15	25	9.8

4.12 Data analysis techniques

Data collected from the survey was subjected to a series of quantitative analysis to map the nature of coopetition capability and hence draw conclusions on the hypothesised relationships between constructs in the conceptual model. The sections that follow next outline the data analysis techniques for the study.

4.12.1 Data examination and descriptive analysis

Data examination begun with an inspection and where necessary correction of each and every questionnaire for completeness and consistency in terms of for example, having a large section of the questionnaire or pages being omitted or having two conflicting responses. This was found not to be a major problem with the questionnaires as all but two passed this test. Of the two, one had the coopetition section not answered after answering 'Yes' to the question 'Does your company cooperate with its competitors'. The other one answered 'No' to the same question implying that their company did not cooperate with competitors but completed the coopetition section. Efforts to clarify with the respondents proved futile as their telephone lines were either constantly engaged or went unanswered. Following Churchill's (1996) remedy advice on incomplete and inconsistent questionnaires, both questionnaires were removed from analysis.

The data were then coded and entered in SPSS 23.0, and using this software were examined for completeness and appropriateness for analysis. At this stage, data examination was deployed to identify missing data, outliers, and any other possible data entry errors as recommended by Hair et al. (2013). Descriptive analysis was conducted using SPSS 23.0 to give an initial understanding of the characteristics of the data. To this effect, central tendencies and measures of dispersion were used to give summaries and a description of the basic features of the data. Chapter 5 presents results of the descriptive analysis.

4.12.2 Measure validation strategy

With a basic description of the data, the study proceeded to assess the reliability and validity of the measures that were to be used in hypothesis testing. This is considered an important stage aimed at identifying and eliminating poorly performing items for the

measures. In line with the literature, measure assessment for the current research involved exploratory factor analysis (EFA), internal consistency, and confirmatory factor analysis (CFA). According to Hair et al. (2010), EFA is a multivariate statistical test used to identify structure within a set of observed measures. For the current study, EFA was used as an initial data reduction and summarisation strategy. Although most of the scales used in this study have been determined and validated in previous research, there was need to preliminarily explore the links between observed and latent variables being that it is the first time to use the study scales in the contexts of coopetition and Zambia. This was then followed by an assessment of internal consistency and reliability of the scales. Subsequently, a series of CFA were conducted to provide a final empirical validation of the scales. Thus, all constructs employed in this study were submitted to CFA with a goal to establish unidimensionality, reliability and validity of the scales. Unlike EFA which is a data-driven approach aimed at exploring an underlying structure pattern in the data, CFA models were specified and estimated based on an existing theory or prior research (Hair et al., 2006). In assessing the CFA models, different evaluative criteria recommended in the literature were used as detailed in chapter 6.

4.12.3 Multivariate modelling technique

Given that the research model contained more than one relationship between two variables, multivariate data analysis defined as all statistical techniques that simultaneously analyse multiple variables was considered appropriate for the study (Hair et al., 1998). While there are various traditional multivariate modelling techniques such as linear regression, logistic regression, poisson regression and ANOVA, for examining relationships between variables in an empirical research, the structural equation modelling (SEM) remains a popular methodological approach and a powerful weapon in the armoury of the marketing modeller (Steenkamp and Van Trijp,

1991; Bagozzi and Yi, 2012). This is because SEM provides a robust modelling approach of combining much of the analytic strengths of the psychometric tradition (emphasising on the measurement), with those of the econometric tradition (emphasising of modelling multi-equation relationships between observed variables). In other words, SEM allows researchers to estimate relationships not only between latent variables and observed indicators but also structural relationships between latent variables, simultaneously. As opposed to the traditional methods which are limited in terms of number of dependent variables in a given model, the multiple regression for example, SEM allows for the estimation of all parameters of interest in a model including multistage complex models involving direct and indirect relationships simultaneously. In addition, SEM is one of the few techniques that accounts for both systematic and random measurement errors while most of the other techniques ignore or probably assume the error does not exist (Anderson and Gerbing, 1988; Bagozzi and Yi, 2012).

Given the above, SEM was considered the preferred causal modelling method for this study because in addition to providing a comprehensive means for assessing and modifying a theoretical model, SEM allowed for the estimation and accounting for both systematic and random errors. In fact, Diamantopoulos and Siguaw (2000) advise that there is need to make allowances for measurement error especially when dealing with fallible measures such as subjective ratings as is the case in this study. In addition, considering the fact that the study's conceptual model involved testing for more than one dependent variable (coopetition capability, coopetition performance and financial performance) including testing the effect of one dependent variable on another, SEM allowed for the estimation and modelling of the complex relationships between all the variables simultaneously.

Furthermore, because SEM allows for the assessment of dimensionality, reliability and validity of multi-item measures, including convergent validity and discriminant validity, it was deemed suitable to provide a robust means to test the study's proposed relationships in the model. SEM also suits the theory testing objective of this study in line with Steenkamp and Van Trijp's (1991) recommendation that while SEM has potential for decision support modelling, it is also useful in theory testing, a key aspect in developing marketing models. Moreover, with over 200 cases, the study beats the minimum sample size requirement which is a major drawback of the SEM technique, further qualifying SEM as the suitable modelling technique for this study.

In order to enhance the analysis and findings of the study regression analysis using SPSS 23 was also employed. So, while SEM was the primary method to test the hypotheses, regression analysis was used to enhance the robustness of the study's analysis and findings.

4.12.4 Model estimation method

While quite a number of methods, such as Instrumental Variables (IV), Two-stage Least Squares (TSLS), Unweighted Least Squares (ULS) and the Maximum Likelihood (ML), exist to be used to estimate the parameters of a model, the study employed the widely employed ML estimator for SEM. The ML is a full information estimator which unlike other estimators, such as the TSLS where model parameters are estimated for each equation separately, it arrives at all parameter estimates simultaneously by using full information from the entire system (Diamantopoulos and Siguaw, 2000). As such, ML allows for more reliable parametric statistical results (Hair et al., 2006).

Another advantage of performing the SEM using the ML estimation method is that it provides a wider variety of fit indices that could be used to determine how well the model under investigation fits the available data. This is not the case with the limited information estimators such as the two-stage least-squares for latent variable SEM (TSLS). Although the TSLS is a good alternative to the ML, especially in situations when the model is tentative and model specification is uncertain of modest misspecification and no excess violation of normality, the TSLS does not provide much on alternative tests to assess model fit (Diamantopoulos and Siguaw, 2000).

Furthermore, the ML is a scale-free method unlike the ULS which is a scale dependent method and as such requires that all observed variables are measured in the same units (Enders and Bandalos, 2001). Probably another alternative to the ML worth mentioning are the asymptotic distribution-free (ADF) estimators which have the advantage over the ML in that they do not require the data to be normally distributed. However, these require very large sample sizes of at least 1000+ and are computationally demanding (Barroso et al., 2010). Moreover, as Diamantopoulos and Siguaw (2000) argue, assuming the model is correctly specified and the sample size is large enough, most of the estimation methods are more likely to produce estimates that are close to the true parameter.

In this study, the model was specified drawing from theory and the characteristics of the data do not point to excess violations of normality, hence the ML qualifies as an appropriate estimation method for the study. According to Browne (1984) and Joreskog and Sorbom (1993), the ML estimator is a statistically more efficient, consistent, asymptotically unbiased, and asymptotically efficient and asymptotically normal in situations of correct model specification and no excess violation of multivariate

normality. Assessment of structural model fit involved evaluation of goodness-of-fit commonly used by researchers including the chi-square (χ^2) statistic, Normed Fit Index (NFI), Non-Normed Fit Index (NNFI), Comparative Fit Index (CFI), and Root Mean Square Error of Approximation (RMSEA) (e.g., Bagozzi and Yi, 2012; Hair et al., 2006; Kline, 1998; Bentler, 1992). Chapter 6 provides a detailed discussion on these goodness-of-fit measures.

4.12.5 Test power

Another issue that should be considered to increase confidence in the study results is test power. This relates to the probability of making a correct decision and is associated with sample size (Kline, 1998). While some scholars (e.g., Kelloway, 1998; Jackson, 2003) recommend a sample of at least 200 for stable parameter estimation in SEM, other scholars (e.g., Kline, 1998; Hair et al., 2006) suggest different sample size-to-parameter ratio ranging between 5:1 and 20:1. Whichever criteria is used, the sample size for this study of 254 is suitable for model testing using the ML estimation method.

4.12.6 Analysis packages

In terms of the analysis package, the study relies on the Linear Structural RELationships (LISREL) 8.50 software package. While there are several statistical packages that can be used to analyse structural equation models (e.g., MPLUS, EQS, and AMOS), LISREL is the most longstanding and widely distributed statistical software which combines confirmatory factor analysis modelling and structural equation modelling (Byrne, 1998). Although a bit sophisticated and demands a relatively larger sample size especially in cases of model complexity, the LISREL remains a powerful methodology for assessing both the theoretical structure of a measurement instrument (relationship between a given construct and its measures) and the relationships between a construct and other constructs in a given model as it accounts for measurement error. According to Diamantopoulos and Siguaw (2000),

LISREL is a rigorous software in the marketing science as well as in other fields where unbiased estimates of the measure's reliability and validity are critical. In addition, the Statistical Package for the Social Science (SPSS) 23 is used to complement the LISREL software specifically in the preliminary and post hoc data analysis.

4.12.7 Quality criteria

Quality criteria of a research project pertains to the assessment of validity and reliability of the measures used to conduct it (DeVellis, 2003). It is of utmost importance that before testing the hypotheses proposed in a study, a rigorous examination of the measures is conducted to ensure that the measures employed are valid in that they indeed capture the domain of the construct which they purportedly represent (Hair et al., 2006; Peter, 1981). In this study, two types of psychometric properties tests namely reliability and validity were conducted. The aim was to ensure that (a) the measurement scales employed measured the constructs of interest in a consistent and stable manner and (b) the model had good fit to the sample data.

4.12.7.1 Assessment of validity

Validity refers to the degree to which an instrument captures the construct, concept, trait it is supposed to be measuring (Churchill, 1979). Hair et al. (2006) state that an assessment of validity of the measurement scales in a study is of paramount importance as it reveals credibility of research findings. In this study, three kinds of validity for each of the constructs were assessed. First is content validity, also known as face validity, which is the extent to which the domain of a construct is indeed captured by the measure (Churchill, 1979). According to Worthington and Whittaker (2006), content validity is a subjective and systematic assessment of whether the measures reflect the construct they are intended to measure. Thus, it is mainly judgemental based where experts in a given field judge the extent to which a set of items reflect the dimensionality of a given construct. In this study, content validity was assessed during

the questionnaire development specifically during the pretesting stage. As mentioned earlier on in this chapter, the questionnaire was subjected to an extensive review by various people, including academic researchers and company managers, familiar with the questionnaire design process and/or knowledgeable of the areas covered in this study. This pool of people provided helpful suggestions and insights with respect to the clarity, conciseness, length and content of the measures which were incorporated into the design of the final measures for the study.

Convergent validity relates to the extent to which different measures that are designed to tap the same construct correlate with each other (Bagozzi et al., 1991; Campbell and Fiske, 1959). The study's convergent validity was established using structural equation modelling approach, employing confirmatory factor analysis specifically. As chapter 6 provides, convergent validity is achieved as the results of the measurement models estimated indicate large and significant loadings of all the items with respect to their posited constructs. This is in line with the literature which indicates that convergent validity is achieved if the loadings for all the items in a given scale are at least 0.5 (Hair et al., 2006; Bagozzi et al., 1991). In addition, the average variance extracted (AVE) for each construct exceeds Fornell and Larker's (1981) recommended minimum level of 0.50.

In terms of discriminant validity, which is the degree to which a construct is distinct and differs from other constructs in the study (Peter, 1981; Campbell and Fiske, 1959), the highest shared variance (HSV) between each pair of constructs were computed by generating the squared terms of their inter-correlations. Then the AVEs for each construct were compared with the HSV of the respective constructs. Refer to chapter 6 for details of this analysis.

4.12.7.2 Assessment of reliability

While validity pertains to the degree to which an instrument captures the construct, concept, trait it is supposed to be measuring, reliability concerns the extent to which an experiment, test, or any measuring procedure yields the same results on a repeated trials (Bagozzi, 1984; Peter, 1979). In short, reliability relates to the consistency in repeated measurements of the same construct. Reliability is of major concern in research due to the existence of measurement error. It is recommended that researchers estimate the reliability of measures used in a study by taking into account the proportion of the variation in observed values that is as a result of random error or inconsistencies in measurement (Peter, 1979). Zikmund (2003) provides two dimensions, namely; repeatability and internal consistency which can be used to determine reliability of a measure. Repeatability relates to the stability of a measure if it is administered to the same respondent at two separate points in time.

On the other hand, internal consistency, which is the most commonly used reliability test, refers to the stability of the measure across its various items (Werner et al., 1996). Although the literature provides a number of different methods for assessing reliability of a measure including the split-half reliability and the test re-test reliability (Nunnally and Bernstein, 1994; Peter, 1981; DeVellis, 2003), the coefficient alpha reliability test was considered to be a more practical approach for the current study. Apart from it being widely used in the marketing field, the alpha coefficient provides an overall indication of the inter-correlations that exist between a set of items used to measure a construct (Malhotra et al., 2004). The literature recommends coefficients of not less than 0.70 as appropriate in the marketing and management fields, and was used in this study (Nunnally and Bernstein, 1994; Bagozzi and Yi, 2012).

Although widely used, scholars argue that coefficient alpha may misestimate reliability as it assumes that scale items are perfectly correlated and without measurement error (e.g., Armor, 1973; Ping, 2004; Gerbing and Hamilton, 1996; Bollen, 1989). In fact, Gerbing and Anderson (1988) empirically demonstrate that a measurement instrument with unacceptable within-method convergent validity can still have a high reliability score. In view of this, construct (or composite) reliability (CR), which indicates how consistently measures represent the same factor was also computed to further assess reliability of the measures in this study (Hair et al., 2013). To this end, results from the CFA were used to manually compute the CR for each measure using DeVellis (2003) and Netemeyer et al. (2003) simplified formula presented in equation 4.1 below.

Equation 4.1 Formula for Calculating Composite Reliability

$$p_x = \frac{(\sum \lambda_i)^2 \mathrm{Var}(X)}{(\sum \lambda_i)^2 \mathrm{Var}(X) + \sum \mathrm{Var}(e_i)}$$

Where:
Px is the composite reliability of X
Σ is the notation for summation.
λi is the loading of Xi on X.
Var(X) is the disattenuated (measurement error free) variance of X.
ei denotes the measurement error for Xi indicators.

The study set 0.60 as the acceptable minimum score for CR to be adequately established (Bagozzi and Yi, 1988; Fornell and Larcker; 1981, Hair et al., 2010).

In addition to the alpha coefficient, the average variance extracted (AVE) which "assesses the amount of variance captured by a set of items in a scale relative to measurement error" (Netemeyer et al., 2003:153) was used to establish reliability of the measures. The AVE was estimated as a function of all squared standard factor loadings divided by the number of items (Netemeyer et al., 2003; Fornell and Larcker, 1981; Hair et al., 2006; Ping, 2004). Hair et al's (2006) recommended threshold of AVE not

less than 0.50 was adopted in this study. Equation 4.2 exhibits the formula that was used to compute the AVE for each of the study constructs.

Equation 4.2 : Formula for Calculating Average Variance Extracted

$$AVE_x = \frac{(\sum \lambda i^2)Var(X)}{(\sum \lambda i^2)Var(X) + \sum Var(e_i)}$$

Where:
AVEx is average variance extracted for X
Σ is the notation for summation.
λi is the loading of Xi on X.
Var(X) is the disattenuated (measurement error free) variance of X.
ei denotes the measurement error for Xi indicators.

Moreover, item-to-total correlation analysis was conducted to further assess internal consistency of the measurement scales in the measure purification stage. This helped to identify and eliminate items that did not belong to the domain of a particular construct (Churchill, 1979). In essence, internal consistence relates to the extent to which items in a given scale are homogeneous and thus it is expected that items highly correlate in an internally consistent scale (DeVellis, 2003). Inter-item correlation score of above 0.3 was used in this study (Hair et al., 2013).

4.13 Common method variance

It is common practice in research to account for the potential effect of common method variance. Common method variance, also known as common method bias, relates to the variance that is attributable to the measurement method rather than to the constructs the measures represent (MacKenzie and Podsakoff, 2012; Podsakoff et al., 2003). According to Podsakoff et al. (2003), CMV is one of the main sources of measurement error, which is error that relates to both random and systematic errors. While random error relates to statistical fluctuations due to the precision limitations of the

measurement device and thus can be evaluated through statistical analysis, systematic error is difficult to detect and leads to misinterpretation of the study findings as it tends to provide alternative explanations for observed relationships and as such, has more serious effects (MacKenzie and Podsakoff, 2012; Bagozzi, 1984; Krippendorff, 1970). A number of strategies were employed to minimise the effect of CMV in this study (see section 6.8). Moreover, two tests (see chapter 6) were conducted to assess the influence of CMV on the study.

After establishing that the measures of the study had adequate measurement properties, the study proceeded to test the hypotheses. Chapter 6 provides a detailed discussion on the criteria used in assessing the CFA models and results of the measure validation procedure for the current study.

4.14 Chapter summary

This chapter has presented the research methods that were employed to achieve the objectives of this study. Exploratory and descriptive research designs employing interviews and a survey based questionnaire, respectively, as methods of data collection have been discussed. Further, a discussion on the analytical statistical tests such as factor analysis and structural equation modelling as well as issues to deal with common method variance has been presented. The chapter has also presented ways on how the study assessed research validity and reliability related concerns. Results of the descriptive analysis are presented in the next chapter.

Chapter 5 : Data examination and descriptive analysis

5.1 Introduction

The purpose of this chapter is to present descriptive results pertaining to the collected survey data. The chapter begins with a presentation of the profile of the study firms. This is then followed by a presentation on missing value analysis and non-response bias tests that were conducted. A basic snapshot of the statistical characteristics of all the scales in terms of percentage frequencies, mean and standard deviation for each of the items in a scale for a given construct is also presented.

5.2 Profile of the study firms

While all SMEs, irrespective of industry, size, or core business, engaged in cooperation with competitors in Zambia formed the population of the study, responses from 254 SMEs were usable in this study. Table 5.1 displays the profile of these study firms. As shown in table 5.1, the majority of the firms operate in the service industry. The firms also vary in terms of their size with 53% of typical employee numbers that ranged between 20 and 250, consistent with SME definition in developing economy contexts (Fjose et al., 2010) while the companies were 15 years old on average. The majority of the companies (82.7%) had less than 5 coopetitive relationships with 21 as the highest number of coopetitive relationships. Approximately 70% of the study sample had coopetition experience of more than 5 years. The firms coopete in different areas including tender submission, employee training, advertising and product distribution. With these variations in the characteristics of the study sample, this study can boast of being able to uncover potential differences in the coopetition practice across a variety of SME firms.

Table 5.1: Profile of study sample

1.Industry type	**Frequency**	**Percentage**
Service	172	67.7
Manufacturing	82	32.3
2.Firm size		
<20 employees	106	41.7
20-49 employees	66	26
50-149 employees	44	17.3
150 -250 employees	25	9.8
>250 employees	13	5.1
3.Firm age		
<5 years	28	11
5-9 years	78	30.7
10-19 years	90	35.4
20-29 years	29	11.4
≥30 years	29	11.4
4.Number of coopetitive relationships at present		
<5	210	82.7
5-9	32	12.6
≥10	12	4.7
5.Company coopetition experience		
<5 years	84	33.1
5-9 years	127	50
10-19 years	34	13.4
≥20 years	9	3.5
6.Areas of coopetition		
Joint tender submission	44	17.3
Information sharing	39	15.4
Joint advertising	35	13.8
Subcontracting	29	11.4
Joint employee training	26	10.2
Equipment and technical support	25	9.8
Supply of raw materials	18	7.1
Joint product distribution	16	6.3
Financial support	8	3.1
Other	14	5.5

Profile no.	***2***	***3***	***4***	***5***
Minimum value	***10***	***2***	***1***	***1***
Maximum value	***251***	***68***	***21***	***42***
Mean value	***59***	***15***	***4***	***7***

5.3 Missing value analysis

Missing value analysis was conducted to assess the extent to which some questions were left unanswered by respondents. This is consistent with Hair et al's (2013) recommendation that missing data analysis should be conducted to ensure that missing data are not too prevalent or occurring non-randomly before any relationship between variables can be examined. When data are incomplete, it can introduce bias as the precision with which a parameter of interest can be estimated is reduced and thereby lead to misleading results (Molenberghs et al., 2014).

As an initial step to correct the missing data situation in this study, respondents who had indicated their telephone numbers on the questionnaire were contacted and phone interviews were conducted to complete the questionnaires. Although costly, this method proved to be an effective way of making the questionnaires complete for the affected respondents who were contacted. This method also served as an effective way of verifying responses provided by the respondents. However, some respondents did not indicate the telephone numbers on the questionnaire while others although indicated, it was difficult to contact them as their telephones went unanswered or were switched off. Accordingly, as recommended in the literature, missing data analysis was conducted using the expectation maximisation (EM) algorithm in SPSS 23.0 (Little and Rubin, 2014; Little and Schenker, 1995). Results of this analysis showed that missing values did not pose a major challenge as the percentage of missing values was less than 5 per cent for all the variables satisfying Tabachnick and Fidell's (2007) and Hair et al's (2003) allowance of 5 per cent or less of missing values. Note that this was after removing questionnaires with excessive missing data as earlier explained.

5.4 Non-response bias

Non-response bias relates to failure to obtain information from some of the sample elements. The researcher made effort to reduce non-response for example by telephoning those who did not complete the questionnaires reminding them to do so and by going back to the respondents where questionnaires had been dropped but promised they would complete it at a later time. A number of reasons were given for the non-response: the questionnaire is too long; no time to fill in the questionnaire; company policy does not allow participation in research as we don't get to see the results or benefits from research; concerns of being reported to tax authorities for tax evasion. So, because not everyone in the sample completed the questionnaire, it can be expected that this study is likely to be affected by non-response.

To reduce the impact of non-response bias, the study follows Armstrong and Overton (1977) and Etter and Perneger (1997) extrapolation test. Employing this method, non-response was assessed by comparing mean responses on coopetition capability and coopetition performance between the early respondents and late respondents. The early respondents being those who completed the questionnaire on time within the one month agreed timeline while the late respondents are those who responded later or needed more pushing and reminding to complete the questionnaire. The assumption is that late respondents or those who need more pushing to complete the questionnaire could be considered as non-respondents according to Pace (1939).

Accordingly, two groups were created: early respondents group comprising 207 of respondents and late respondents group comprising 47. Response of these groups to two key study constructs namely coopetition capability and coopetition performance were compared. Results of the extrapolation test indicate that nonresponse was not an

issue in this study as there were no significant differences in the responses of the two groups to the two constructs: coopetition capability (t = 0.93; p = 0.2) and coopetition performance (t = 0.86; p = 0.9). Thus, it can be concluded that non-response bias did not significantly affect the study.

5.5 Descriptive findings of scale items

This section presents the descriptive findings for each of the five main constructs of this thesis in the following order: Coopetition capability, managerial ties, coopetition learning process, institutional support, and coopetition performance. Refer to appendix 5A for the descriptive results for the control variables.

5.5.1 Descriptive results of coopetition capability

Table 5.2 exhibits the descriptive findings with respect to the measurement of the five dimensions of the coopetition capability construct, namely, coopetition interfirm coordination (five items), coopetition portfolio coordination (four items) coopetition learning (six items), coopetition proactiveness (six items), and coopetition transformation (four items). SME managers were asked to rate on a seven-point Likert-type scale the extent to which they perceived their companies to have routines and mechanisms for managing coopetition, with (1) being strongly disagree and (7) being strongly agree.

From the table, it can be seen that the mean score for all the items for each of the five dimensions of coopetition capability is above the mid-point of 3.5. This suggests that respondents perceived their companies to have the necessary routines and mechanisms for managing coopetitive relationships. While the mean scores for all the items of the five dimensions were above the mid-point, it is worth mentioning that coopetition learning exhibited the highest average mean score of 5.14. Coopetition interfirm

coordination was second highest with an average mean score of 4.76; followed by coopetition portfolio coordination (4.63); and then coopetition proactiveness (4.22). Coopetition transformation yielded the lowest average mean score of 4.12. It can also be seen from table 5.2 that there is considerable variation in the participant's responses as indicated by the significant standard deviations.

Table 5.2 :Descriptive findings for coopetition capability scale

Items	Response scale							Scale descriptive	
	Strongly disagree						Strongly agree		
Coopetition interfirm coordination	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**Mean**	**SD**
Joint activities with our competing partners are well coordinated.	3.5%	5.1%	8.3%	19.7%	31.5%	22.8%	9.1%	4.75	1.44
Joint tasks with our competing partners fit very well.	5.1%	1.6%	5.1%	22.5%	26.4%	28%	11.4%	4.93	1.46
Joint work with our competing partners is harmonised.	2%	2%	8.3%	15.4%	30.3%	29.9%	12.2%	5.09	1.33
Systematically coordinate strategies across different partnerships with competitors.	7.9%	3.9%	7.9%	18.9%	30.7%	22.8%	7.1%	4.59	1.57
Great deal of communication with our competing partners on most decisions.	5.9%	6.3%	12.6%	25.2%	20.1%	20.9%	9.1%	4.46	1.60
Coopetition portfolio coordination									
Coordination among the cooperative activities of our different competing partners.	5.9%	6.3%	7.9%	31.5%	24%	16.1%	8.3%	4.43	1.53
Determine areas of synergy with our competing partners.	9.1%	5.5%	9.4%	19.7%	32.3%	16.9%	7.1%	4.40	1.61
Interdependencies between our competing partners are identified.	2.8%	3.5%	5.1%	18.1%	27.6%	33.1%	9.8%	5.02	1.37
Determine any overlaps between our different competing partners.	6.3%	5.1%	9.5%	16.9%	27.6%	26.8%	7.9%	4.66	1.58
Coopetition learning									
Have the capability to learn from our competing partners.	2%	1.2%	5.5%	10.6%	26%	28.7%	26%	5.48	1.36
Have the managerial competence to absorb new knowledge from our competing partners.	2%	2%	4.3%	12.2%	26%	33.9%	19.7%	5.28	1.39
Have adequate routines to analyse the information obtained from our competing partners.	1.6%	2.8%	7.5%	13.8%	20.5%	36.6%	17.3%	5.28	1.39

Table 5.2: Descriptive findings for coopetition capability scale (continued)

Items	Response scale							Scale descriptive	
	Strongly disagree						Strongly agree		
Coopetition learning	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**Mean**	**SD**
Conduct periodic reviews of our partnerships with competitors.	3.9%	9.5%	5.5%	17.7%	29.1%	24.4%	9.8%	4.71	1.56
Modify relationships with our competing partners as we learn from experience.	2.8%	8.3%	5.9%	11.4%	29.2%	26%	16.5%	5.00	1.57
We integrate our existing knowledge with new information acquired from competing partners.	2%	5.5%	7.9%	15.4%	23.3%	26%	20.1%	5.11	1.53
Coopetition proactiveness									
We pre-empt our competition by entering into partnership opportunities with our competitors.	16.2%	11%	15%	29.2%	12.6%	12.2%	3.9%	3.63	1.70
We often take the initiative in approaching competitors with partnership proposals.	11%	17.7%	12.6%	16.9%	21.3%	14.6%	5.9%	3.87	1.77
We are proactive in finding and going after partnerships with competitors.	11%	11.8%	12.6%	22.5%	22.5%	14.6%	5.1%	3.98	1.70
We monitor our environment to identify partnership-with-competitors opportunities.	7.9%	12.6%	7.9%	21.7%	21.7%	17.7%	10.6%	4.33	1.75
We gather information about prospective competing partners from various forums (e.g., trade shows, publications, internet etc.).	4.7%	7.1%	7.1%	14.2%	28.8%	25.2%	13%	4.83	1.60
We are alert to market developments that create potential partnership-with-competitors opportunities.	5.1%	5.5%	9.1%	23.2%	22.8%	23.2%	11%	4.67	1.58
Coopetition transformation									
We are willing to put aside contractual terms to improve the outcome of our partnerships with competitors.	8.3%	16.9%	13%	26.4%	19.7%	9.8%	5.5%	3.83	1.62

Table 5.2: Descriptive findings for coopetition capability scale (continued)

Items	Response scale							Scale descriptive	
	Strongly disagree						Strongly agree		
Coopetition transformation	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**Mean**	**SD**
We would rather modify a partnership agreement with our competitors than insist on the original terms.	8.3%	15.7%	10.2%	24%	20.1%	15%	6.7%	4.03	1.70
We are willing to change our partnership with competitors in case of any change in the business environment.	7.1%	10.2%	8.3%	21.3%	24.8%	19.3%	9.1%	4.41	1.68
Flexibility is characteristic of our partnership-with-competitors' management process.	7.1%	9.1%	7.9%	28%	23.6%	16.3%	8.3%	4.34	1.61

5.5.2 Descriptive results of managerial ties

Managerial ties in this study captures the extent to which a manager perceived to have skills to connect with managers and/or employees of other companies. This was measured on a seven-point Likert-type scale ranging from (1) not at all to (7) to an extreme extent. Descriptive results in table 5.3 show that the mean scores for all the items are well above the mid-point of the scale with the item labelled "I can obtain information about my industry faster than my competitors" having the highest mean value (5.2). It can therefore be concluded that managers perceived to have strong connections with managers and/or employees of other companies. The significant standard deviations for all the items indicate that there is considerable variation in the participants' responses.

Table 5.3 : Descriptive findings for coopetition managerial ties scale

Item	Response scale							Scale descriptive	
	Not at all						to an extreme extent		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	Mean	SD
I can obtain information about my industry faster than competitors.	1.2%	2%	5.5%	21.3%	25.6%	26.4	18.1	5.2	1.32
I can obtain resources needed for business success faster than competitors.	3.1%	2.8%	5.1%	26.4%	26.4%	25.6%	10.6%	4.89	1.38
I have a professional relationship with someone influential in my industry.	7.9%	2.8%	9.1%	16.1%	18.9%	33.1%	12.2%	4.84	1.69
I have engaged with someone influential in my industry in informal social activity.	18.5	6.7%	4.7%	20.5%	18.1%	21.3%	10.2	4.17	1.98

5.5.3 Descriptive results of coopetition learning process

Coopetition learning process was conceptualised as a second-order construct comprising coopetition knowledge articulation (six items), coopetition knowledge codification (four items), coopetition knowledge sharing (six items) and coopetition knowledge internalisation (four items). A seven-point Likert-type scale anchored by (1) = strongly disagree and (7) = strongly agree was used to capture the participants' perception as regards the presence of these coopetition learning processes in their companies.

Descriptive results displayed in table 5.4 indicate that most of the responses fell on the upper-end of the scale in all types of coopetition learning processes. The mean scores for all the items are above the mid-point of the scale. It can therefore be concluded that most of the participants considered their companies to employ the four coopetition learning processes. Coopetition knowledge sharing yielded the highest average mean value (4.27), followed by coopetition knowledge articulation (4.18) and then coopetition knowledge codification (4.06). Coopetition knowledge internalisation recorded the lowest average mean value (3.96). The standard deviations are significant for all the items indicating that there was considerate variation in the response

Table 5.4 :Descriptive findings for coopetition learning process scale

Item	Response scale							Scale descriptive	
	Strongly disagree						Strongly agree		
Coopetition knowledge articulation	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**Mean**	**SD**
The manager involved with partnerships with competitors is regularly debriefed about their prior and/or current partnership experience.	11.4%	11.4%	11.4%	20.2%	25.6%	14.2%	5.5%	4.02	1.71
The manager responsible for partnerships with competitors maintains a report of all major partnership decisions.	9.4%	11.8%	9.4%	21.3%	21.7%	21.7%	4.7%	4.18	1.70
The manager regularly reports on the performance of the partnerships with competitors.	9.8%	15%	8.3%	18.7%	15.4%	24.8%	7.1%	4.19	1.83
We maintain a database containing factual information of each of our partnerships with competitors (e.g., date and purpose of formation).	9.4%	11.4%	14.6%	24.4%	15.4%	16.9%	7.9%	4.07	1.73
We maintain a contact list of individuals from within who can provide assistance on partnerships with competitors.	8.7%	5.5%	12.2%	25.2%	17.7%	23.6%	7.1%	4.37	1.66
We maintain a contact list of individuals from outside who can provide assistance on partnerships with competitors.	10.6%	7.5%	10.6%	23.2%	21.3%	19.7%	7.1%	4.24	1.72
Coopetition knowledge codification									
The manager follows a well-defined process to guide the formation or management of any partnership with competitors.	12.6%	9.8%	7.9%	29.9%	12.6%	20.5%	6.7%	4.08	1.78
Guidelines are developed and used to assist managerial decision making while forming or managing partnerships with competitors.	11%	9.1%	11.4%	26%	16.9%	16.1%	9.4%	4.15	1.77

Table 5.4: Descriptive findings for coopetition learning process scale (continued)

Item	Response scale							Scale descriptive	
	Strongly disagree						Strongly agree		
Coopetition knowledge codification	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**Mean**	**SD**
Manuals (containing tools) are developed and used to assist managerial decision making while forming or managing partnerships with competitors.	11.8%	11.8%	12.6%	23.6%	15.7%	15.4%	9.1%	4.02	1.81
We update the guidelines or manuals related to partnerships with competitors	13.8%	9.4%	12.6%	24.4%	16.1%	14.2%	9.1%	3.99	1.82
Coopetition knowledge sharing									
Management conducts a collective review to assess the progress and performance of its partnerships with competitors.	8.3%	8.3%	10.2%	22.9%	23.6%	20.5%	6.3%	4.32	1.65
Management participates in forums such as committees to take stock of their management experience related to partnerships with competitors.	8.3%	9.8%	11.8%	20.1%	23.6%	18.1%	8.3%	4.29	1.70
Management participates in forums such as meetings, to exchange information and experiences related to partnerships with competitors.	6.3%	8.3%	11.4%	18.1%	26.8%	21.3%	7.9%	4.46	1.62
Management engages in informal sharing and exchange of information related to partnerships with competitors with colleagues.	7.1%	6.3%	10.2%	24.4%	26.8%	18.5%	6.7%	4.40	1.56
Managers with prior experience in managing partnerships with competitors are usually rotated across some of the company's partnerships.	10.2%	11.8%	7.1%	24.4%	26.4%	14.2%	5.9%	4.11	1.68
Managerial incentives are used to encourage individual managers to share their management experience related to partnerships with competitors.	14.2%	10.2%	6.3%	24.8%	22.4%	16.1%	5.9%	4.03	1.78

Table 5.4: Descriptive findings for coopetition learning process scale (continued)

Item	Response scale							Scale descriptive	
	Strongly disagree						Strongly agree		
Coopetition knowledge internalisation	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**Mean**	**SD**
Managers attend in-house training programs on managing partnerships with competitors.	16.5%	10.2%	8.7%	30.3%	13.4%	14.6%	6.3%	3.83	1.80
Managers attend externally conducted training programs on managing partnerships with competitors.	11%	16.5%	15.4%	20.5%	15.7%	16.1%	4.7%	3.81	1.74
We provide opportunities for on-the-job training to individuals who are relatively new to managing partnerships with competitors.	12.6%	9.1%	11.8%	23.2%	19.3%	13%	11%	4.11	1.82
We provide managers access to information on prior and ongoing partnerships with competitors.	11.4%	11.8%	9.4%	20.1%	18.9%	18.5%	9.8%	4.18	1.84

5.5.4 Descriptive results of institutional support

Six items were used to capture the institutional support construct. Respondents were asked to indicate on a seven point Likert-type scale the extent to which the government and its agencies provided the support they consider critical for the successful operations of firms in their industry. A low score (1) = strongly disagree would indicate that institutional support is very low, and a high score (7) = strongly agree would indicate that the government and its agencies highly support business operations of firms in the respective industry. As shown in table 5.5, apart from one, all the items yielded mean scores lower than the 3.5 mid-point. This suggests that respondents slightly disagree that the government and its agencies provide support for firms in the industry. However, there is some variation in the responses as indicated by the significant average standard deviation (1.92).

Table 5.5: Descriptive findings for institutional support scale

Item	Response scale							Scale Descriptive	
	Strongly disagree						Strongly agree		
The government and its agencies…	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**Mean**	**SD**
provide needed technical support for companies.	25.6%	22.4%	11%	10.6%	14.2%	10.2%	5.9%	3.2	1.94
play a significant role in providing financial support for companies.	28.7%	24.8%	10.6%	11%	9.1%	11.4%	4.3%	2.98	1.90
help companies to obtain raw materials and equipment needed for their operations.	29.9%	22%	12.2%	10.2%	7.1%	11%	7.5%	3.05	2
sets aside government contracts for new and small businesses.	21.7%	19.3%	10.6%	18.9%	12.2%	13.4%	3.9%	3.37	1.86
have special support available for individuals who want to start a new business.	18.5%	17.3%	14.2%	19.3%	12.2%	13%	5.5%	3.5	1.85
assist individuals with starting their own businesses.	25.6	14.2%	9.1%	16.5%	16.1%	13.8%	5.1%	3.46	1.95

5.5.5 Descriptive results of coopetition performance

Coopetition performance in this study relates to the performance of the coopetitive relationships in terms of strength and harmoniousness of the relationships as well as primary objectives in forming the relationships being achieved. On a seven-point Likert-type scale ranging from (1) = strongly disagree and (7) = strongly agree, mean scores above the mid-point scale with significant standard deviations were obtained for all the four items of this scale. This means that the respondents generally were satisfied with the performance of their coopetitive relationships. Table 5.6 below displays the descriptive results for coopetition performance.

Table 5.6 : Descriptive findings for coopetition performance scale

Items	Response scale							Scale descriptive	
	Strongly disagree						Strongly agree		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	Mean	SD
Our partnerships with competitors are characterized by strong and harmonious relationships.	7.5%	6.7%	4.7%	21.7%	26.8%	24%	8.7%	4.60	1.62
Our company has achieved its primary objective in forming the partnerships with competitors.	7.1%	8.3%	7.9%	22.5%	25.6%	18.9%	9.8%	4.48	1.65
Our company's competitive position has been greatly enhanced due to partnerships with competitors.	7.1%	6.7%	9.8%	25.6%	18.1%	26.8%	5.9%	4.45	1.62
Our company has been successful in learning some critical skills or capabilities from its competing partners.	2.8%	7.1%	5.1%	18.5%	23.6%	31.1%	11.8%	4.94	1.50

5.6 Normality and outliers

Considering that the quantitative analysis technique for the study is SEM using the ML estimation method, which requires that the data in the sample under investigation is normally distributed, an examination on the spread of the data was conducted. The study relied upon skewness, which indicates symmetry of the distribution and kurtosis, which indicates peakedness of the distribution, to determine normality of the data (Finch, et al., 1997). According to Hair et al. (2003), non-normality obtains in the data if skewness is higher than 3 and kurtosis is higher than 21, and it is recommended that such data abnormality is corrected (Churchill, 1995). A test of normality for this study revealed that the multi-item scales did not deviate significantly from normality as skewness and kurtosis scores were within the acceptable limits (see chapter 6 for the results). As regards the single item constructs (company age, coopetition experience, financial performance, and company size), a natural logarithm of the scale's items was calculated before being included in hypotheses testing as recommended by Osborne and Waters (2002).

Subsequently, a check for outliers, extreme data points with a unique combination of characteristics from other observations (Hair et al., 1998), was conducted to further determine normality of the data. Because these can distort a study's findings, it is recommended that they are discarded from the data (West et al., 1995). The assessment of extreme values in this study did not reveal worrying possible influence of outliers. The fact that the study is confined to a rating scale ranging from 1 to 7 must have precluded any possibility of observations falling outside this range. In cases where no rating scale was used, such as variables used to profile the firms (e.g., age, experience),

a total of eleven cases with extreme values were removed from the analysis in line with Ory and Mokhtarian's (2010) recommendation.

5.7 Chapter summary

The aim of this chapter was to present the descriptive results of the scales used in this study. A profile of the study firms has been presented and indicates a wide variation in characteristics of the study sample. In addition an assessment of missing observations and normality tests of the data has been conducted and discussed. Descriptive results of the multi-item scales are also presented. Apart from institutional support, all the constructs yielded mean scores above the scale mid-point. In addition, a significant standard deviation (>1.0) was obtained for all the multi-item scales indicating considerable variation in the responses of the participants. The next chapter presents measure validation procedures for the study.

Chapter 6 : Measure assessment and purification

6.1 Introduction

Having described the data in the previous chapter, this chapter presents analytical procedures employed to develop valid and reliable measures. One of the major challenges in social science research is to evaluate whether the collected data are in line with the theoretical expectation in terms of pattern and structure of the target construct and to therefore confirm that the measures have indeed measured what they are purported to measure. To this end, organisational methodology scholars (e.g., Anderson, 1987; Churchill, 1979; DeVellis, 2003; Hair et al., 2012; Worthington and Whittaker, 2006; Nunnally and Bernstein, 1994) recommend rigorous statistical analyses are undertaken by way of assessing the viability and validity of the measures before proceeding to hypothesis testing. Factor Analysis is one of the analysis techniques researchers employ to achieve this. By definition, factor analysis is a data reduction technique aimed at establishing unidimensionality, reliability and validity of the scales used in a study (Hair et al., 2013).

As mentioned in the methodology chapter, the multiple item measures used to measure the theoretical constructs for this study were derived from an extensive review of the extant literature. The items' wording were adapted, where necessary, to reflect managers' understanding of the study constructs following suggestions during the exploratory interviews and each item was measured using a seven-point Likert-type scale. The study adopts three analytical procedures commonly used in the measure assessment and purification. First, exploratory factor analysis (EFA) was used to identify the factor structures for a set of variables and to also serve as an initial data reduction strategy by identifying and eliminating poorly performing items (Bandalos, 1996). This was then followed by an assessment of internal consistency of the multi-

item scales by way of item-to-total and item-to-item correlation analysis for all the items in a scale of a given construct. The third kind of analysis, confirmatory factor analysis, was undertaken to establish convergent validity of the measures and dimensionality of the scales. In the sections that follow next, an account is given of the steps followed and the results of the assessment at each stage of the analysis.

6.2 Exploratory factor analysis

EFA was the initial item selection and assessment technique used in this study. The aim was to help (1) determine the number of factors underlying the variation in and correlations among the items, (2) identify the items that load onto particular factors, and (3) remove items that did not load onto any of the extracted factors (Bandalos, 1996). According to Hair et al. (2010), two key factor analysis techniques are often used in factor analysis, namely, the principal component analysis (PCA) and common factor analysis. This study used the principal component analysis which, unlike the common factor analysis, is recommended for item selection and refinement for already established scale. Since the study did not develop any new scale, the common factor analysis was not suitable for the study (Hair et al., 2010; Hair et al., 2006).

Two principles guided this preliminary data reduction strategy. First, all items that highly cross loaded and did not load high on their underlying factors, were removed from further analysis (Steenkamp and Van Trijp, 1991). Second, all items with coefficients of less than 0.4 were also removed (Hair et al., 2006). At the same time, items were evaluated based on content and theoretical interpretation. Due to sample size restriction, the EFA was run in two subsets with conceptually similar constructs (Hair et al., 2010; Tabachnick and Fidell, 2007; Guadagnoli and Velicer, 1988). The first set had seven factors: institutional support (INST), collaboration with other market

players (CMKTP), managerial ties (MTIE) and the four dimensions of coopetition learning process of articulation (ARTIC), codification (CODI), sharing (SHAR) and internalisation (INTERN). Thus, a model comprising 36 items was run and the factors were freely estimated, allowing the analysis to take what the data brought up (Anderson and Gerbing, 1988).

Results for the initial EFA for this model returned an eight factor model instead of the expected seven factor model. The eight factors extracted explained 74% of the cumulative variance in the model. An inspection of the results showed that most of the items were not problematic apart from a few. The first being SHAR1 (first indicant of sharing) and INTERN4 (fourth indicant of internalisation) that both cross loaded on ARTIC (articulation). However, since their loadings on ARTIC were lower than their loadings on their underlying factors, it was decided that they are not removed from the model. In addition, the first and second indicants of collaboration with other market players (CMKTP1 and CMKTP2) created a surplus factor (2CMKTP). However, content analysis of the items showed that these needed to be part of this scale and so it was decided that they are not removed from the model but submitted for further analysis. Table 6.1 displays the results of the final EFA for the first set (see Appendix 6A and 6Ai for the initial EFA and eigenvalues results for set 1).

Table 6.1 : Final EFA results for set 1

	Component							
Items	**ARTIC**	**INST**	**CMKTP**	**MTIE**	**SHAR**	**INTERN**	**2CMKTP**	**CODI**
INST1		.48						
INST2		.67						
INST3		.67						
INST4		.77						
INST5		.83						
INST6		.86						
CMKTP1							.81	
CMKTP2							.80	
CMKTP3			-.83					
CMKTP4			-.93					
CMKTP5			-.80					
CMKTP6			-.79					
MTIE1				.81				
MTIE2				.78				
MTIE3				.71				
MTIE4				.85				
ARTIC1	.70							
ARTIC2	.62							
ARTIC3	.58							
ARTIC4	.56							
ARTIC5	.53							
ARTIC6	.40							
CODI1								.92
CODI2								.93
CODI3								.89
CODI4								.93
SHAR1	.45*				.47			
SHAR2					.80			
SHAR3					.82			
SHAR4					.95			
SHAR5					.68			
SHAR6					.68			
INTERN1						-.46		
INTERN2						-.46		
INTERN3						-.63		
INTERN4	.46*					-.50		

*KMO: 0.87; Bartlett's Test: 7457.49 (sig. 0.00); Percentage of variance explained: 74%; * Cross-loading item*

The second set of EFA model comprised 34 items of the remaining seven factors: the five dimensions of coopetition capability namely, coopetition interfirm coordination, coopetition portfolio coordination, coopetition proactiveness, coopetition learning and coopetition transformation; coopetition structure and coopetition performance. As expected, a seven factor solution was returned explaining 71% of the cumulative variance in the model. However, LEARN4 was below the 0.4 cut-off point and was therefore removed from the model. Also, LEARN5 and LEARN6 cross loaded on PCOORD. In line with the principles guiding this analysis, LEARN5 was deleted as its loading on PCOORD was higher than the loading on its underlying factor LEARN. However, LEARN6, though also cross loaded, was not removed from the model as its loading on LEARN was higher than on PCOORD, meaning it was more identified with the LEARN properties. Similarly, PROAC1 was retained despite cross loading on PCOORD as its loading on its underlying factor was relatively higher. Furthermore, PROAC5 and PROAC6 strongly loaded on LEARN and not on its expected underlying factor, PROAC and were thus deleted from the model together with CSTRU4 which significantly loaded on LEARN. Having removed the five items (LEARN4, LEARN5, PROAC5, PROAC6 and CSTRU4), a second EFA was run. Table 6.2 gives the EFA final results for set 2 (see appendix 6B and 6Bi for the initial EFA results for set 2). As can be seen from the table, seven factors were extracted explaining 74% of the cumulative variance, an improvement from the 71% for the initial EFA model. Another point to note on this final model results is that PROAC1 cross loaded on PCOORD but the loading on the underlying factor was higher and so was not removed from the model.

Table 6.2: Final EFA results for set 2

Items	Component						
	PCOORD	TRANS	CSTRU	LEARN	CPERF	ICOORD	PROAC
ICOORD1						.78	
ICOORD2						.71	
ICOORD3						.58	
ICOORD4						.57	
ICOORD5						.57	
PCOORD1	.61						
PCOORD2	.76						
PCOORD3	.41						
PCOORD4	.70						
LEARN1				.87			
LEARN2				.86			
LEARN3				.73			
LEARN6				.62			
PROAC1	.45*						-.49
PROAC2							-.73
PROAC3							-.82
PROAC4							-.62
TRANS1		.85					
TRANS2		.84					
TRANS3		.76					
TRANS4		.83					
CSTRU1			-.82				
CSTRU2			-.86				
CSTRU3			-.70				
CSTRU5			-.78				
CPERF1					-.72		
CPERF2					-.78		
CPERF3					-.84		
CPERF4					-.74		
*KMO: 0.88; Bartlett's Test: 5155.57 (sig. 0.00); Percentage of variance explained: 74%; * Cross-loading item*							

6.3 Internal consistency analysis

The scales that passed EFA were assessed for internal consistency to examine the extent to which items in a given scale correlated with each other and the scale itself and to establish reliability of the scale. This is a common practice in social science and it is

an important quality assurance technique that ensures that the items of the factors that passed EFA are indeed suitable for further analysis in a confirmatory factor analysis (Gerbing and Anderson, 1988).

The rule of thumb when assessing internal consistency is that the higher the item-to-item and the item-to-total scale correlations, the better, and items with low and/or negative correlations are considered for deletion (Netemeyer et al., 2003; Spector, 1992; Nunnally, 1978). This study examined internal consistency of the items and reliability of the scales using the Cronbach's alpha technique provided in SPSS 23.0. Employing this technique, inter-item as well as inter-scale correlations and coefficient alpha for each scale were estimated. Consistent with Hair et al's (2013) recommendation, items with negative correlations and inter-item correlation coefficients and inter-scale correlations of less than critical values of 0.3 and 0.4, respectively, were considered for exclusion from the scales in this study. To determine reliability of the scales, that is the extent to which items in a given scale reliably represented the domain of their underlying factor, a coefficient (Cronbach) alpha of 0.70 was set as the cut-off point (Nunnally and Bernstein, 1994a).

Results show that all scale items met the threshold of at least 0.3 inter-item correlations with managerial ties scale recording the lowest correlation of 0.31(correlations between MTIE1 and MTIE4) and the codification scale items (CODI4 and CODI3) recording the highest inter-item correlation (0.86). See appendix 6C for details. With respect to the item-to-total correlations, all the items are above the minimum recommended threshold value of 0.4 and are in the expected direction as can be seen from table 6.3 below. This is an indication that all the items exhibited strong association with their respective scales, with the lowest being 0.47 MTIE4 to the scale of managerial ties.

Furthermore, it can been seen from the table that the Cronbach's alpha for each scale was greater than Nunnally and Bernstein's (1994a) recommended minimum threshold value of 0.70 ranging from 0.73 to an impressive 0.94. This was taken as an indication of construct reliability across the study scales.

With these satisfactory results, it was concluded that internal consistency for all the scales was established. The study then proceeded to conduct confirmatory factor analysis to further establish convergent and discriminant validity of the measures in readiness for substantive hypothesis testing.

Table 6.3 : Cronbach's alpha and item-to-total correlations

Latent variable (No. of items)	Item	Cronbach's Alpha	Corrected Item-Total Correlation
Institutional support(6)	INST1	.87	.58
	INST2		.73
	INST3		.73
	INST4		.64
	INST5		.65
	INST6		.67
Collaboration with other market players (6)	CMKTP1	.86	.48
	CMKTP2		.48
	CMKTP3		.74
	CMKTP4		.64
	CMKTP5		.80
	CMKTP6		.78
Managerial ties (4)	MTIE1	.73	.48
	MTIE2		.59
	MTIE3		.61
	MTIE4		.47
Coopetition Interfirm coordination (5)	ICOORD1	.85	.63
	ICOORD2		.73
	ICOORD3		.66
	ICOORD4		.61
	ICOORD5		.65

Table 6.3: Cronbach's alpha and item-to-total correlations (continued)

Latent variable (No. of items)	Item	Cronbach's Alpha	Corrected Item-Total Correlation
Coopetition portfolio coordination (4)	PCOORD1	.84	.69
	PCOORD2		.74
	PCOORD3		.59
	PCOORD4		.69
Coopetition learning (4)	LEARN1	.87	.74
	LEARN2		.81
	LEARN3		.70
	LEARN6		.66
Coopetition proactiveness (4)	PROAC1	.85	.59
	PROAC2		.82
	PROAC3		.74
	PROAC4		.62
Coopetition transformation (4)	TRANS1	.89	.72
	TRANS2		.72
	TRANS3		.76
	TRANS4		.80
Coopetition structure (4)	CSTRU1	.85	.68
	CSTRU2		.82
	CSTRU3		.59
	CSTRU5		.70
Coopetition knowledge articulation (6)	ARTIC1	.93	.77
	ARTIC2		.83
	ARTIC3		.81
	ARTIC4		.77
	ARTIC5		.78
	ARTIC6		.75
Coopetition knowledge codification (4)	CODI1	.94	.82
	CODI2		.87
	CODI3		.86
	CODI4		.88
Coopetition knowledge sharing (6)	SHAR1	.91	.72
	SHAR2		.77
	SHAR3		.83
	SHAR4		.70
	SHAR5		.76
	SHAR6		.77

Table 6.3: Cronbach's alpha and Item-to-total correlations (continued)

Latent variable (No. of items)	Item	Cronbach's Alpha	Corrected Item-Total Correlation
Coopetition knowledge internalisation (4)	INTERN1	.91	.75
	INTERN2		.81
	INTERN3		.77
	INTERN4		.82
Coopetition performance (4)	CPERF1	.84	.64
	CPERF2		.73
	CPERF3		.71
	CPERF4		.61

6.4 Confirmatory factor analysis

Following the generally favourable exploratory factor analysis and internal consistency results, the researcher conducted confirmatory factor analysis (CFA) employing the Maximum Likelihood (ML) estimation method in LISREL (See Chapter 4.8 for details). Unlike EFA, CFA is based on a priori theoretical understanding or conceptualisation of a construct and the factor structure underlying a given data. It is aimed at examining the extent to which theory is replicated in the data and hence, it provides researchers with an objective way against which to accept or reject hypotheses about the nature of a construct (Gerbing and Anderson, 1988). It is through CFA that dimensionality of a construct by assessing convergent validity as well as discriminant validity, is established (DeVellis, 2003; Gerbing and Anderson, 1988). Moreover, CFA serves as another data reduction strategy and further scale reliability can be established in the form of composite reliability and average variance extracted (Netemeyer et al., 2003). In short, CFA serves as a robust measurement validation procedure because it accounts for both external and internal consistency and validity of the measures (Schumacker and Lomax, 2010; Byrne, 1998; Gerbing and Anderson, 1988).

Since CFA is based on a priori theoretical understanding of the construct and the underlying factor structure, the researcher pre-specified the composition of the CFA models based on extant theory. To this end, the study followed established guidelines in the literature (e.g., Hair et al., 2013; Diamantopoulos and Siguaw, 2000; Jaworski and Kohli, 1993; Anderson and Gerbing, 1988) for CFA model estimation. Essentially, relationships between observed (items in the questionnaire) and latent variables (unobserved) that the model was to estimate were specified after creating covariance matrix and mean files in LISREL 8.5 software. Each latent variable was corresponded to one and only one of its indicants (Anderson and Gerbing, 1988). Then, as literature recommends, the first latent variable was constrained to one in order to set the unit of measurement of the latent variables (Diamantopoulos and Siguaw, 2000; Hair et al., 2013).

Scholars (e.g., Bentler and Chou, 1987; Gagne and Hancock, 2006; Hair et al., 2006) recommend that a 1:5 ratio between number of parameters and number of observations in a model for a proper model convergence and parameter estimate accuracy. However, considering that the study does not meet this requirement, the study relied on previous research recommendation that CFA is done in subsets in cases where the sample size requirement is not met and there is a relatively large number of parameters to be estimated (Gagne and Hancock, 2006, Bentler and Chou, 1987). This approach is recommended by Gerbing and Anderson (1988), and is widely employed in marketing research (e.g., Katsikeas et al., 2009; Hultman et al., 2009; Morgan et al., 2012).

Accordingly, four measurement models were estimated in this study. To start with, Measurement Model 1 assessed the dimensionality of the main construct, coopetition capability. Drawing from previous interfirm relationship management theory, this

model comprised the five dimensions of coopetition capability, namely; coopetition interfirm coordination, coopetition portfolio coordination, coopetition proactiveness, coopetition learning, and coopetition transformation (Ireland et al., 2002; Schreiner et al., 2009; Schilke and Goerzen, 2010). This was followed by Measurement Model 2 aimed at examining the dimensions of other coopetition themed constructs in the study (i.e. coopetition structure; coopetition learning processes of articulation, codification, sharing and internalisation; and coopetition performance). Measurement Model 3, containing the other constructs in the model (i.e institutional support, collaboration with other market players and managerial relational skills), was later assessed. Lastly, Measurement Model 4, an overall model which comprised all the constructs retained in the three previous models was run. The aim of this model was to assess the robustness of the measures used in this study. Once run, the CFA model results show the overall model fit as well as the contribution of each of the parameters and can serve as basis for model re-specification (Byrne, 2006; Hair et al., 2006; Keith et al., 2006).

6.4.1 Assessment of model fit

A number of measurement assessment criteria drawn from established guidelines in the literature were followed to determine the extent to which a given model was consistent with the empirical data at hand (goodness-of-fit). Firstly, drawing from Hair et al. (2013) and Anderson and Gerbing (1988), only items that had recorded a standardised loading of at least 0.5 on the underlying factors with low correlated errors were considered for inclusion. Secondly, the study relied upon advice to use chi-square goodness-of-fit statistic to assess fit for the CFA models. A low and non-significant chi-square is recommended and it is interpreted as good model fit, meaning that the discrepancy between the sample and the covariance matrices is not significant. In short, the model fits the population data perfectly. On the other hand, a statistically

significant chi-square implies imperfect model fit and a possible rejection of a model (Hu and Bentler, 1999; Diamantopoulos and Siguaw, 2000).

However, scholars (e.g., Byrne, 2006; Hair et al., 1998) caution that because the chi-square statistic is sensitive to sample size, it is not unusual for it to be significant in larger samples, even though there are slight model variations from the data. On account of this limitation, the study followed a common practice in previous research where the normed chi-square (chi-square divided by the degrees of freedom) was estimated to determine fit of the models. The rule of thumb is for this parsimonious fit measure to be not more than three (<3) (Iacobucci, 2010).

In addition, the Root Mean Square Error of Approximation (RMSEA) which is an indication of a standardised summary of the average covariance residuals (the differences between the observed and implied model covariances) was used to examine fit between the specified model and the observed covariances (Bollen, 1989; Diamantopoulos and Siguaw, 2000; Byrne 1998). The study's criteria for model fit was a RMSEA score of ≤ 0.08 in line with Iacobucci's (2010) recommendation.

To test for additional robustness of the measures, three incremental fit statistics were computed: Normed Fit Index (NFI), Non-Normed Fit Index (NNFI) and Comparative Fit Index (CFI). These served to measure proportionate improvements in fit by comparing the specified model to a competing null model (Diamantopoulos and Siguaw, 2000; Byrne, 1998; Hu and Bentler, 1999). For example, while NFI is used to indicate the proportion in the improvement of the overall fit of the CFA model relative to a null model, NNFI serves the same purpose but also serves to correct for model complexity and is usually preferred (Bentler and Chou, 1987). On the other hand, CFI

is similar to NNFI only that CFI is not affected by small sample size (Bentler, 1992). According to Bentler (1992), for good fit, these indices should be 0.90 or better, meaning that the overall fit of the specified model is 90% better than the independence model. Table 6.4 below summarises the model fit indices that guided this study.

Table 6.4: CFA model fit indices

Index	**Threshold**	**Sources**
Chi-Square (χ^2)	≥0.05	Anderson and Garbing, 1988; Bagozzi and Yi, 2012; Byrne, 1998; Bentler, 1992; Bollen, 1990; Gonzales and Griffin, 2001; Iacobucci, 2010.
Normed Chi-Square(χ^2/df)	≤3	
Normed Fit Index (NFI)	≥0.9	
Non-Normed Fit Index (NNFI)	≥0.95	
Comparative Fit Index (CFI)	≥0.95	
Root Mean Square Error of Approximation (RMSEA	≤0.08	

6.4.2 CFA measurement model 1: Scales for coopetition capability

In line with prior alliance management literature (e.g., Schilke and Goerzen, 2010; Schilke, 2014a) which was supported by the exploratory interviews, coopetition capability was viewed as a higher-order construct comprising five dimensions: coopetition interfirm coordination; coopetition portfolio coordination; coopetition learning; coopetition proactiveness; and coopetition transformation, as earlier mentioned. Accordingly a CFA model was estimated comprising 21 indicants of the five dimensions with path coefficients of the first indicant for each dimension fixed to 1.0. The five dimensions were linked to coopetition capability, the higher-order construct, fixing one dimension (coopetition interfirm coordination) to 1.0. As earlier mentioned, factor loadings were used in the scale purification process. Specifically, items with non-significant loadings (<0.5) were excluded from the model.

The chi-square test was used to assess the exact model fit. The initial CFA model (see appendix 6D) did not return a converged solution with acceptable fit. This indicated a need for model purification (i.e.χ^2 = 1522.75; df = 270; RMSEA = 0.14; NNFI = 0.74; CFI = 0.77; IFI = 0.77 and GFI = 0.68). An inspection of the modification indices showed that a number of items had large residuals, indicating need for purification. Therefore, six items (ICOORD4, ICOORD5, PCOORD4, LEARN3, PROAC4, and TRANS4) with residuals higher than 0.5 were deleted from the model and the model was re-specified and re-estimated. This resulted in a better fit to the data as the chi-square, although was still significant, had substantially reduced. Table 6.5 exhibits the results of this re-specified CFA coopetition capability model.

Table 6.5: CFA measurement model 1: Coopetition capability construct

Factor	Standardised loadings[a]	Error variances
COOPETITION CAPABILITY		
Coopetition Interorganisational coordination	**0.81[b]**	
ICOORD1	0.77[b]	0.41
ICOORD2	0.89(13.17)	0.21
ICOORD3	0.68(10.65)	0.53
Coopetition portfolio coordination	**.82(11.72)**	
PCOORD1	0.85[b]	0.28
PCOORD2	0.89(16.96)	0.20
PCOORD3	0.79(14.70)	0.37
Coopetition learning	**.59(8.07)**	
LEARN1	0.80[b]	0.36
LEARN2	0.92 (14.90)	0.16
LEARN3	0.77(13.21)	0.40
Coopetition proactiveness	**.68(8.39)**	
PROAC1	0.70[b]	0.51
PROAC2	0.93(12.28)	0.13
PROAC3	0.78(11.47)	0.40
Coopetition transformation	**.51(6.72)**	
TRANS1	0.76[b]	0.43
TRANS2	0.86(13.21)	0.25
TRANS3	0.85(13.10)	0.28

Fit Indices: χ^2= 232.53; *df* = 85; *p* < 0.01; NFI= 0.90; NNFI=0.95; CFI=0.96; RMSEA =0.08;
[a]*t*-values in parenthesis; [b]fixed parameter; loadings for second-order in bold

From the results it can be seen that the fit indices and factor loadings meet the criteria set for this study. Specifically, all relevant fit statistics were within acceptable limits (χ^2= 232.53; df = 85; $p < 0.01$; NFI= 0.90; NNFI= 0.95; CFI= 0.96; RMSEA = 0.08). In addition, each item loaded strongly on the respective factor with loadings of 0.5 or better, confirming the item's association with the underlying factors.

Given that coopetition capability is the focal construct for this study, there was need to undertake additional assessments to ensure that the scale is indeed a good representation of the construct. Also, additional assessment was necessary to confirm the dimensional structure of the construct. Although it is conceptualised as a higher-order multidimensional construct in this study, one could argue, for example, that it is a single structure construct comprising each of the five dimensions. Therefore, three competing models were run. In the first model, all the 15 items that passed the first null model were forced to load onto one factor, coopetition capability. Then a second model with 5 items, representing the highest loading for each of the five dimensions forced to load onto one factor (coopetition capability), was run. Lastly, a first order CFA with each of the five dimensions with their respective indicants that passed the hypothesised model was run to test if coopetition capability can be conceptualised as a first-order construct with five independent dimensions without a second-order common factor, coopetition capability. The results of the three competing models were then compared with the hypothesised five dimensional higher-order construct model. Table 6.6 below displays the fit indices for the three models (see appendix 6E for the factor loadings of the three competing models).

Table 6.6: Fit indices for the four coopetition capability CFA models

Fit Measure	Hypothesised Five-dimensional higher-order model	Competing Model 1[a]	Competing Model 2[b]	Competing Model 3[c]
χ^2	232.53	1271.24	34.87	190.21
p-values	0.00	0.00	0.00	0.00
Df	85	90	5	80
χ^2/df	2.74	14.12	6.97	2.38
RMSEA	0.08	0.23	0.15	0.07
NNFI	0.95	0.47	0.76	0.96
NFI	0.90	0.52	0.87	0.92
CFI	0.96	0.54	0.88	0.97

***Note**: [a]Competing Model 1 =15items single factor dimensional Model*
[b]Competing Model 2 = five items single factor dimensional Model
[c]Competing Model 3 = five dimensional first order
RMSEA = Root Mean Square Error of Approximation; NNFI = Non-Normed Fit Index; CFI = Comparative Fit Index.

A comparison of the first two competing models with the hypothesised second-order model clearly reveals that the latter offers in many ways the best of the two competing models in terms of fit. For example, the normed chi-square statistic for the three models indicates that the hypothesised model has the smallest value (2.74), suggesting best model fit. Moreover, all other fit heuristics showed that the hypothesised higher-order model has the best fit to the data. However, fit indices for the hypothesised higher-order model are not as good as the third first-order competing model (e.g., normed chi-square statistic of 2.74 versus 2.38). This is not surprising in that although the second-order model explains co-variations among first-order factors in a more parsimonious way, variations shared by the first-order factors cannot be totally explained by a single second-order factor, hence fit indices of a higher-order model can never be better than the corresponding first-order model (Segars and Grover, 1998; Cao and Zhang, 2011). Accordingly, as scholars recommend (e.g., Schilke and Goerzen, 2010; Cao and Zhang, 2011), target coefficient index (T) (where T = first-order χ^2/second-order χ^2) was computed. As shown in table 6.7 the *T* coefficient for coopetition capability (82%) meets the required minimum value of 80% (Marsh and

Hocevar, 1985; Cao and Zhang, 2011) supporting the postulated model structure of coopetition capability as a second-order construct in this study comprising coopetition interfirm coordination; coopetition portfolio coordination; coopetition learning; coopetition proactiveness; coopetition transformation.

Table 6.7: Fit indices for first and second-order model and T coefficients

Construct	Model	χ^2(df)	Normed χ^2	CFI	NNFI	RMSEA	*T* coefficient
Coopetition capability	First-order	190.19(80)	2.38	0.97	0.96	0.07	82%
	Second-order	232.53(85)	2.74	0.96	0.95	0.08	
Coopetition learning process	First-order	303.08(120)	2.53	0.97	0.96	0.07	88%
	Second-order	341.21(128)	2.67	0.96	0.95	0.08	

6.4.3 CFA Measurement model 2: Coopetition themed constructs

In measurement model 2, other coopetition themed constructs (besides the five dimensions of coopetition capability) in the study were examined. These are: coopetition structure; four coopetition learning processes of: coopetition knowledge articulation; coopetition knowledge internalisation; coopetition knowledge sharing; coopetition knowledge codification; and coopetition performance. While coopetition structure and coopetition performance were conceptualised as single factor constructs, coopetition learning process was conceptualised as a higher-order construct comprising coopetition knowledge articulation; coopetition knowledge codification; coopetition knowledge sharing; and coopetition knowledge internalisation in this study. This is in line with interfirm relationship and organisational learning literatures (e.g., Kale and Singh, 2007) and further supported by exploratory interviews.

Again, each item was made to load on its respective factor while the path coefficient of the first items of each factor was fixed to 1.0 as per the CFA specification practice in

this study. The four coopetition learning factors of articulation, codification, sharing and internalisation were linked to the higher-order coopetition learning construct. It was found that of the 28 items in the model, ten items (i.e. CSTRU1, ARTIC4, ARTIC5, ARTIC6, CODI1, SHAR1, SHAR4, SHAR6, INTERN4, and CPERF4) although with seemingly high factor loadings (above 0.5), were associated with large correlated error terms hence were excluded from further analysis. (See appendix 6F for an initial CFA for model 2). Table 6.8 shows the final CFA results for this model after a purification process.

The CFA results show that all goodness-of-fit diagnostic indicators for the purified model meet their respective criteria (Table 6.8). The normed chi-square of 2.67 is below the 3.0 threshold. In addition, all t-values were significant and the lowest item loading was 0.63 well above 0.5 cut-off point. However, because coopetition learning was conceptualised as a higher-order construct in this study, a competing CFA model of coopetition learning with four first-order dimensions was run. The aim was to test if the four factors of coopetition learning are independent with no second-order common factor, coopetition learning underlying all of them (Kale and Singh, 2007). The loadings of the competing first-order four factor model are displayed in appendix 6G. Although the fit indices of the first-order four factor model are better than for the second-order CFA model, the *T* coefficient as shown in table 6.7 above for coopetition learning process is above the required minimum of 80% and demonstrates that a large portion of the variance within the first-order factors can be explained through the second-order construct (Marsh and Hocevar, 1985). This supports the study's conceptualisation of coopetition learning process as a higher-order construct.

Table 6.8: CFA measurement model 2: Coopetition themed constructs

Factor	Standardised loadings[a]	Error variances
Coopetition structure		
CSTRU2	0.86[b]	0.26
CSTRU3	0.63(10.76)	0.60
CSTRU5	0.85(15.87)	0.29
Coopetition knowledge articulation	***0.93[b]***	
ARTIC1[b]	0.87[b]	0.24
ARTIC2	0.90(20.00)	0.19
ARTIC3	0.85(18.00)	0.28
Coopetition knowledge Codification	***0.82(13.47)***	
CODI2[b]	0.89[b]	0.21
CODI3	0.92(22.20)	0.15
CODI4	0.91(21.68)	0.17
Coopetition knowledge Sharing	***0.81(11.68)***	
SHAR2[b]	0.80[b]	0.36
SHAR3	0.88(15.00)	0.23
SHAR5	0.79(13.46)	0.37
Coopetition knowledge Internalisation	***0.74(11.28)***	
INTERN1[b]	0.86[b]	0.26
INTERN2	0.86(15.98)	0.26
INTERN3	0.77(13.82)	0.41
Coopetition performance		
CPERF1[b]	0.79[b]	0.38
CPERF2	0.86(12.94)	0.27
CPERF3	0.71(11.19)	0.49

Fit Indices: $\chi^2 = 341.21$; $df = 128$; $p < 0.01$; NFI = 0.91; NNFI = 0.95; CFI = 0.96; RMSEA = 0.08; [a]*t*-values in parenthesis; [b]fixed parameter. Loadings for second-order construct in bold.

6.4.4 CFA Measurement model 3: Non-coopetition themed constructs

Measurement model 3 estimated three non-coopetition themed constructs of institutional support; collaboration with other market players; and managerial ties. Again, the first item of each factor was fixed to 1.0. The initial CFA produced poor model fit and so an inspection of the factor loadings was conducted. The inspection found 5 items (INST5, INST6, CMKTP2, CMKTP4 and MTIE4) with poor factor

loadings (see appendix 6H). These were deleted from the model, and the model was re-estimated. This CFA model attained acceptable fit to show that the model was a better fit. Table 6.9 displays the factor loadings and fit heuristics for this model.

Table 6.9: CFA measurement model 3: Non-coopetition themed constructs

Factor	Standardised loadings[a]	Error variances
Managerial ties		
MTIE1	0.78[b]	0.40
MTIE2	0.86(8.08)	0.24
MTIE3	0.52(7.15)	0.72
Institutional support		
INST1	0.74[b]	0.46
INST2	0.87(12.90)	0.24
INST3	0.84(12.66)	0.30
INST4	0.56(8.53)	0.68
Collaboration with other market players		
CMKTP1	0.51[b]	0.73
CMKTP3	0.70(7.22)	0.34
CMKTP5	0.94(7.95)	0.18
CMKTP6	0.89(7.91)	0.23

Fit Indices: χ^2 = 79.09; df = 41; p < 0.01; NFI = 0.94; NNFI = 0.96; CFI = 0.97; RMSEA = 0.061;[a]t-values in parenthesis; [b]fixed parameter.

6.4.5 CFA measurement model 4: All study constructs

Finally, measurement model 4 was an overall CFA that contained study constructs examined in the preceding measurement models. Thus, all 44 items retained in model 1 through to model 3 were modelled simultaneously. The aim of this model was to assess the robustness of the measures used in this study. Considering the large number of items included in this model, the model converged with some of the fit heuristics acceptable: (χ^2 = 2173; df = 830; p < 0.01; NFI=0.75; NNFI=0.81; CFI=0.83; RMSEA=0.08) apart from the NFI, NNFI and CFI which were slightly below the threshold set for this study. The normed chi-square and RMSEA met Iacobucci's (2010) upper limit of 3 and 0.08 respectively. On account of this, it was concluded that the measures were robust and thus suitable to be used for hypothesis testing.

6.5 Validity and reliability

Having successfully conducted confirmatory factor analysis for the constructs in this study, all constructs were submitted to convergent validity, discriminant validity and reliability evaluations. The aim was to further establish the extent to which the retained CFA measures reflected their latent constructs and also discriminated from other constructs (Hair et al., 2013) as earlier stated in Chapter 4. In line with recommendation in the measure validation literature, the study assessed the reliability and validity of the constructs by computing the Cronbach alpha, average variance extracted and composite reliability for each of the multi-item constructs (Hair et al., 2006; Bagozzi and Yi, 1988; Ping, 2004; Grewal et al., 2004; Peter 1981; Fornell and Larcker, 1981).

As shown in table 6.10, assessment of reliability and convergent validity in this study indicates satisfactory results. In particular, all the constructs recorded Cronbach alpha above 0.70 satisfying Bagozzi and Yi's (2012) threshold. In addition, the composite reliability (CR) for each construct ranged between 0.77 (managerial ties) and 0.93 (codification), well above the recommended threshold of 0.70 (Bagozzi, 1980). Furthermore, the average variance extracted (AVE) for all constructs were within Hair et al's (2006) accepted cut-off point of 0.50 ranging from 0.54 (managerial ties) to 0.82 (codification) providing further evidence of the reliability as well as convergent validity of the measures.

Moreover, the results indicate that convergent validity was established as all the indicants loaded significantly on their respective factors with 0.52 (third item of managerial ties) as the lowest loading satisfying Hair et al's (2006) threshold of 0.5. The fact that the full CFA model surprisingly converged with decent model fit as well as significant standardised loadings is further proof of robustness of the measures.

Taken together, these statistics provide evidence that the study scales provided a reliable measure of the constructs in the model and have acceptable convergent validity.

Table 6.10: Details of measures and results of validity tests

CONSTRUCTS AND DETAILS OF ITEMS	Alpha	CR	AVE
COOPETITION CAPABILITY			
Coopetition Interorganisational coordination	**0.82**	**0.83**	**0.61**
Cooperative activities with our competing partners are well coordinated. We ensure that joint work tasks with our competing partners fit very well. We ensure that joint work with our competing partners is harmonised.			
Coopetition portfolio coordination	**0.88**	**0.88**	**0.72**
There is a great deal of communication with our competing partners on most decisions. There is coordination among the cooperative activities of our different competing partners. We determine areas of synergy with our competing partners.			
Coopetition learning	**0.86**	**0.87**	**0.69**
We have the capability to learn from our competing partners. We have the managerial competence to absorb new knowledge from our competing partners. We have adequate routines to analyse the information obtained from our competing partners.			
Coopetition proactiveness	**0.84**	**0.85**	**0.66**
We pre-empt our competition by entering into partnership opportunities with our competitors. We often take the initiative in approaching competitors with partnership proposals. We are proactive in finding and going after partnerships with competitors.			
Coopetition transformation	**0.86**	**0.86**	**0.68**
When an unexpected situation arises, we would rather modify a partnership agreement with our competitors than insist on the original terms. We are willing to change our partnership with competitors in case of any change in the business environment. Flexibility, in response to a request for change, is characteristic of our partnership-with-competitors' management process.			

Table 6.10: Details of measures and results of validity tests (continued)

CONSTRUCTS AND DETAILS OF ITEMS	Alpha	CR	AVE
MANAGERIAL TIES	**0.73**	**0.77**	**0.54**
I can obtain information about my industry faster than competitors. I can obtain resources needed for business success faster than competitors. I have a professional relationship with someone influential in my industry.			
COOPETITION LEARNING PROCESS			
Knowledge articulation	**0.91**	**0.91**	**0.77**
The manager involved with partnerships with competitors is regularly debriefed about their prior and/or current partnership experience. The manager responsible for partnerships with competitors maintains a report of all major partnership decisions. The manager regularly reports on the performance of the partnerships with competitors.			
Knowledge codification	**0.93**	**0.93**	**0.82**
Guidelines are developed and used to assist managerial decision making while forming or managing partnerships with competitors. Manuals (containing tools) are developed and used to assist managerial decision making while forming or managing partnerships with competitors. We update the guidelines or manuals related to partnerships with competitors			
Knowledge sharing	**0.86**	**0.86**	**0.68**
Management participates in forums such as committees to take stock of their management experience related to partnerships with competitors. Management participates in forums such as meetings, to exchange information and experiences related to partnerships with competitors. Managers with prior experience in managing partnerships with competitors are usually rotated across some of the company's partnerships.			

Table 6.10: Details of measures and results of validity tests (continued)

CONSTRUCTS AND DETAILS OF ITEMS	Alpha	CR	AVE
Knowledge internalisation	**0.87**	**0.87**	**0.69**
Managers attend in-house training programs on managing partnerships with competitors. Managers attend externally conducted training programs on managing partnerships with competitors. We provide opportunities for on-the-job training to individuals who are relatively new to managing partnerships with competitors.			
INSTITUTIONAL SUPPORT	**0.84**	**0.84**	**0.57**
The government and its agencies provide needed technical support for companies. The government and its agencies play a significant role in providing financial support for companies. The government and its agencies help companies to obtain raw materials and equipment needed for their operations. The government sets aside government contracts for new and small businesses.			
COOPETITION PERFORMANCE	**0.83**	**0.83**	**0.62**
Our partnerships with competitors are characterized by strong and harmonious relationships. Our company has achieved its primary objective in forming the partnerships with competitors. Our company's competitive position has been greatly enhanced due to partnerships with competitors.			
FIRM PERFORMANCE			
Please indicate the (approximate) annual sales of your company in the last year. Please indicate the (approximate) annual profit of your company in the last year			
CONTROLS:			
COLABORATION WITH OTHER MARKET PLAYERS	**0.75**	**0.85**	**0.60**
We spend considerable effort on collaborating with customers. We spend considerable effort on collaborating with suppliers. We spend considerable effort on collaborating with distributors. We maintain good relationships with distributors			
COOPETITION STRUCTURE	**0.84**	**0.82**	**0.61**
There are units primarily dedicated to the management of partnerships with competitors. We have a porous organizational boundary that facilitates better communication with our competing partners. There is an employee(s) primarily dedicated to the management of partnerships with competitors.			

Table 6.10: Details of measures and results of validity tests (continued)

CONSTRUCTS AND DETAILS OF ITEMS
FIRM AGE
How many years has your company been in this business?
FIRM SIZE
How many full-time employees does your company have?
COOPETITION EXPERIENCE
For how long has your company been cooperating with competitors?

The study also examined discriminant validity, which is the extent to which the measures of the study constructs are distinct from one another and capture a phenomenon that other constructs do not (Peter, 1981). The study followed Fornell and Larker's (1981) procedure whereby the highest shared variance (HSV) between each pair of constructs was computed by generating the squared terms of their inter-correlations. Then the AVEs for each construct were compared with the HSV of the respective constructs. Table 6.11 provides results of this analysis. As can be seen from the table, the AVE scores ranged from 0.54 to 0.82 while the squared correlation terms for the constructs ranged from 0 to 0.53. Following Ping (2004) and Anderson and Gerbing, (1988) recommendation, it is evident that discriminant validity for each construct was achieved as the AVE scores are significantly higher than the squared correlation estimates in all cases.

6.6 Creating measurement index

Because of the number of multi-item constructs in the model and considering the analysis software (LISREL 8.5) that was used, there was need to reduce the data for purposes of measurement model evaluation and hypothesis testing. Accordingly, the study proceeded to compute a measurement index by creating composite variables for each of the multi-item construct including the higher-order constructs, relying on established guidelines provided in the psychometric literature (e.g., Churchill, 1979; Ping, 2004; Jaccard and Wan, 1996). The following sections outline how the measurement index was created for all the constructs in this study.

6.6.1 Composites for higher-order constructs

As coopetition capability is a higher-order construct comprising five dimensions: coopetition interfirm coordination, coopetition portfolio coordination, coopetition learning, coopetition proactiveness, and coopetition transformation, a single coopetition

capability score COPCAC was created for the purposes of measurement model evaluation and hypothesis testing. To start with, composite scores for each of the five dimensions were computed from the average of the retained CFA scale items. Thus: ICOORDC = (ICOORD1 + ICOORD2 + ICOORD3)/3; PCOORDC = (PCOORD1 + PCOORD2 + PCOORD3)/3; LEARNC = (LEARN1 + LEARN2 + LEARN3)/3; PROACC = (PROAC1 + PROAC2 +PROAC3)/3; and TRANSC = (TRANS1 + TRANS2 + TRANS3)/3.

Subsequently, a single indicant for coopetition capability, COPCAC, was created by averaging the five newly created single indicants of its dimensions: COPCAC = (ICOORDC + PCOORDC + LEARNC + PROACC + TRANSC)/5. This new coopetition capability score was then used in subsequent analysis and testing.

A similar process was undertaken for the other higher-order construct, coopetition learning process. Single scores for each of its four dimensions: Articulation (ARTIC), Codification (CODI), Sharing (SHAR) and Internalisation (INTERN) were obtained by averaging across their individual appropriate scale items. The single scores of the four dimensions were then averaged to give a single score of the coopetition learning process construct that was used in subsequent analysis.

6.6.2 Composites for single factor constructs

For the single factor constructs: coopetition performance, institutional support, managerial ties, collaboration with other market players and coopetition structure, single scores were obtained by simply averaging the scale items that passed the CFA. Three items were averaged to obtain a single coopetition performance score (CPERFC). The purified institutional support scale comprises four items which were averaged to create a single indicant INSTC. Similarly, averaged scores of the three

purified CFA items were obtained for managerial ties, collaboration with other market players, and coopetition structure to create single indicants of MTIEC, CMKTPC and CSTUC, respectively. The study used these single indicants in hypothesis testing.

6.6.3 Composites for interaction terms

Since the conceptual model includes two moderators (coopetition learning process and institutional support), it was necessary to create composite scores for the interactions for model parsimony purposes (Ping, 1995). Accordingly, Ping's (1995) procedure for building and estimating the structural models with interactions using SPSS 23 was followed. This process started with the creation of single scores for coopetition capability, coopetition learning process and institutional support (see previous section). Having created single scores of the constructs, the next step involved mean-centering each relevant latent variable to reduce the likelihood of multicollinearity arising from the introduction of a new interaction predictor (the product of the main effect and moderator) which is likely to highly correlate with the independent variable in the structural model (Smith and Sasaki, 1979; Ping, 1994; Ping, 1995; Little et al., 2006; Tabachnick and Fidell, 2007). Accordingly, an arithmetic mean for each of the variables was obtained and subtracted from all of the variable's values, and thus creating new mean centred variables for coopetition capability (COPCMC), coopetition learning process (CLPMC) and institutional support (INSTMC). Next, the new mean-centered variables were multiplied to create two interaction predictors, namely; COPCLP (COPCMC x CLPMC) and COPINST (COPCMC x INSTMC).

6.7 Construct inter-correlations and descriptive statistics

After completing the scale purification and quality assessments, the study examined the inter-correlations among the constructs as well as the descriptive characteristics of the scales. The inter-construct correlation analysis was aimed at assessing multicollinearity

among the constructs, which is a major concern in multivariate statistical analysis as it may lead researchers to making misleading conclusions in that when two independent variables significantly correlate, it is difficult to estimate the effects of each one of them on the dependent variable (Hair et al., 2006; Tabachnick and Fidell, 2007, and Ping, 1995). Results of construct inter-correlations analysis in this study do not reveal any major multicollinearity concern of very high correlations between constructs. Notably, the highest correlation, 0.73, was between CLPC (coopetition learning process) and CSTRU (coopetition structure). However, this construct correlation score is acceptable as it is below the upper limit of 0.80 (Hair et al., 1998; Grewal et al., 2004). In addition, the HSV (0.53) is lower than the respective AVE (0.61) of all the study constructs (Fornell and Larcker, 1981; Farrell, 2010) providing further support that multicollinearity was not a major issue among the study constructs.

Also, considering that the study employed the structural equation modelling technique with the maximum likelihood estimation approach which requires data normality (Sharma, 1996; Hair et al., 2006; Chou and Bentler, 1995), there was need for descriptive analysis of the scales. Accordingly, each scale was examined for normality using Skewness and Kurtosis criteria of not higher than three and 21, respectively (Finch et al., 1997; West et al., 1995). Thus, any scale with skewness higher than three and/or kurtosis higher than 21 was considered not to have passed the normality test. Results of the descriptive analyses for the scales presented in table 6.11 show that none of the scale scores deviated from the skewness and kurtosis criteria with skewness values ranging from -1.41 to 0.95 and kurtosis ranging from -0.71 to 3.04. Moreover, the standard deviations of the main study constructs ranged from 0.66 to 1.58, suggesting that there was considerable variation in the responses provided by the participants in the survey. Apart from institutional support, all multi item constructs

were above the neutral mean (3.5). As regards the single item constructs (company age, coopetition experience, financial performance, and company size), a natural logarithm of the scale's item was calculated before being included in hypotheses testing (Osborne and Waters, 2002). In all, the descriptive analysis provides support for data normality.

Table 6.11: Measurement statistics, construct inter-correlations and highest shared variance

Construct	Mean	SD	Skew	Kurt	1	2	3	4	5	6	7	8	9	10	11	12
1. Coopetition capability	4.56	1.00	-.37	.58	**0.85**	.06	0.42	0.00	0.30	0.05	0	0.00	0.03	0.23	0.03	0.00
2. Managerial ties	4.98	1.18	-.75	.81	.24**	**0.73**	0.03	.18**	0.03	0.04	0.00	0.01	0.00	0.04	0.02	0.01
3. Coopetition learning process	4.10	1.35	-.41	-.49	.65**	.17**	**0.89**	.14*	0.37	0.08	0.00	0.00	0.04	0.53	0.03	0.00
4. Institutional support	3.15	1.58	.52	-.71	.02	0.03	0.02	**0.84**	0.01	0.00	0.01	0.01	0.00	0.04	0.05	0
5. Coopetition performance	4.51	1.40	-.51	-.03	.55**	.17**	.61**	.11	**0.83**	0.10	0	0.01	0.03	0.20	0.04	0.00
6. Financial performance	3.40	.66	-1.41	3.04	.23**	.19**	.28**	-.06	.32**	**NA**	0.00	0.01	0.01	0.03	0.00	0.00
7. Firm size	3.51	1.01	.65	-.68	-.00	.03	.01	-.09	-.00	-.07	**NA**	0.25	0.04	0.00	0.01	0.00
8. Company age	2.38	.79	-.01	.41	.02	.08	.02	-.10	.09	.09	.50**	**NA**	0.18	0.00	0.01	0.00
9. Coopetition experience	1.70	.66	-.22	1.06	.16*	.07	.20**	.04	.17**	.11	.20**	.43**	**NA**	0.02	0.00	0.00
10. Coopetition structure	3.92	1.56	-.23	-.71	.48**	.21**	.73**	.19**	.45**	.17**	.03	-.01	.15*	**0.84**	0.02	0.01
11. CMKTPOC[a]	5.72	1.09	-1.35	2.05	.17**	.14*	.17**	.22**	.20**	-.04	-.09	-.08	-.03	.14*	**0.75**	0.01
12. Industry type	2.65	1.22	.95	-.21	-.07	.11	.03	-.00	-.02	.04	-.02	.04	-.05	-.08	-.11	**NA**
CR					**0.86**	**0.77**	**0.89**	**0.84**	**0.83**	**NA**	**NA**	**NA**	**NA**	**0.82**	**0.85**	**NA**
AVE					**0.67**	**0.54**	**0.74**	**0.57**	**0.62**	**NA**	**NA**	**NA**	**NA**	**0.61**	**0.60**	**NA**

Correlations significant: at the 0.05 level; ** Correlations significant at the 0.01 level; construct inter-correlations below diagonal; Cronbach alpha on diagonal; Highest shared variance above diagonal; [a]Collaboration with other market players; SD = Standard deviation

6.8 Common method variance assessment

Common method variance (CMV) is one of the major concerns in social science research (Feldman and Lynch, 1988; Williams and Brown, 1994; Straub et al., 2004; Podsakoff et al., 2003; Malhotra et al., 2006). As defined in chapter 4, CMV refers to the spurious covariance shared among variables due to the common method used in collecting data. There are three potential sources of CMV in this study. The first relates to the characteristics of the items, scale format and scale anchor that were used in this study. According to Podsakoff et al. (2003) complexity and ambiguity of the items can influence scores attached to a given measure. In this study, effort was made to use simplified wordings of the items and clear instructions were given on the scale format and on scale anchors that were used.

The second source pertains to the broader research context in which the measures were obtained. This relates mainly to the time, location and method of administering the questionnaire. The fact that face-to-face interviews were conducted, it is possible that respondents could have given answers that they thought would socially be desirable and would suit interviewer's expectations. To minimise this, respondents were assured of anonymity and confidentiality. In addition respondents were asked to be as honest as they could be and were explicitly told that there were no right or wrong answers.

The third and last potential source relates to the fact that both measures for the predictor and performance measures were gotten from the same source. Podsakoff et al. (2003) recommends that measures for the predictor and criterion variables should be obtained from different respondents to avoid self-report bias. This was not the case in

the confines of this study because this meant that more time and financial resources were allocated.

Notwithstanding the effort that was made to reduce the influence of the potential sources of CMV in this study, two tests were conducted post ante to ensure fidelity of the data. The first test, the Harman's single-factor, involved comparing fit for a multi-factor model and a constrained single-factor model to check for spurious correlations between variables (Podsakoff et al., 2003). According to Malhotra et al. (2006), CMV exists when fit for the unconstrained multi-factor model is significantly worse than that of the constrained single-factor model. In other words, if the single-factor model yields better fit, one could argue that CMV accounted for the observed relationships between the variables. Following this method, a CFA was run in LISREL where all the factors were loaded onto one factor for each of the three CFA models in this study. As can be seen from table 6.12 the fit indices for the single latent models were completely inadequate while that of the research measurement models meet all accepted criteria. This indicates that CMV is not a major threat to the data and findings deduced from it.

Table 6.12: Results of the Harman's single factor tests

CFA factors	Models	χ^2/df	RMSEA	NNFI	NFI	CFI
Coopetition interfirm coordination, Coopetition portfolio coordination, Coopetition learning, Coopetition proactiveness, Coopetition transformation.	Measurement (multi-factor) model	232.53/85	0.08	0.95	0.90	0.96
	Constrained (Single-factor) model	1381.57/94	0.23	0.48	0.51	0.53
Coopetition structure, Coopetition knowledge articulation, Coopetition knowledge, codification, Coopetition knowledge sharing, Coopetition knowledge internalisation, Coopetition performance.	Measurement (multi-factor) model	341.21/128	0.08	0.95	0.91	0.96
	Constrained (Single-factor) model	1275.85/140	0.18	0.68	0.68	0.71
Managerial ties, Institutional support, Collaboration with other market players.	Measurement (multi-factor) model	79.09/41	0.06	0.96	0.94	0.97
	Constrained (Single-factor) model	728.92/46	0.24	0.37	0.46	0.47

Although the Harman's single factor is simple and straightforward, it is said to be too lenient as it does not sufficiently detect moderate or small levels of CMV (Lindell and Whitney, 2001; Malhotra et al., 2006; Kemery and Dunlop, 1986; Podsakoff et al., 2003; Podsakoff and Todor, 1985). Consequently, another test, the marker-variable technique, was conducted in this study. The use of another test is also consistent with Chang et al's (2010) recommendation to researchers to use multiple methods when testing for method bias. The marker variable technique requires that a special variable that is theoretically unrelated to at least one variable in the study is incorporated into a study along with the research variables at the start of data collection (Lindell and Whitney, 2001). Where this is not done a priori, Lindell and Whitney (2001) recommends that the second-smallest positive correlation can be used as the basis for CMV adjustment. The fact that this study did not incorporate a marker variable ex ante, the second-smallest positive correlation (0.01) was used as the basis for CMV adjustment. Accordingly, using Malhotra et al's (2006) formula given below, the impact of CMV on the magnitude and significance of the correlations was estimated. Table 6.13 displays results of the CMV-adjusted correlation matrix.

Equation 6.1: Formula for calculating CMV-adjusted correlations

$$r_A = \frac{r_u - r_m}{1 - r_m}$$

Where:
r_A= CMV-adjusted correlation between the variables under investigation
r_u = uncorrected (pre-adjustment) correlation
r_m = the second-smallest positive correlation between the variables in the study (indicating the second most theoretically unrelated variables)

Table 6.13: CMV-adjusted construct inter-correlations

Construct	1	2	3	4	5	6	7	8	9	10	11	12
1. Coopetition capability	1	.23**	.65**	0	.55**	.22**	-.01	.01	.15*	.47**	.16*	-.08
2. Managerial ties	.24**	1	.16*	.18**	.16*	.18**	.02	.07	.06	.20**	.13	.10
3. Coopetition learning process	.65**	.17**	1	.14*	.61**	.27**	0	.01	.19**	.72**	.16*	.02
4. Institutional support	.02	.17**	.13	1	.10	-.07	-.10	-.11	.03	.18**	.21**	-.01
5. Coopetition performance	.55**	.17**	.61**	.11	1	.31**	-.01	.08	.16*	.44**	.19**	-.03
6. Financial performance	.23	.19**	.28**	-.06	.32**	1	-.08	.06	.10	.16*	-.05	.03
7. Firm size	-.00	.03	.01	-.09	-.00	-.07	1	.49**	.19**	.02	-.10	-.03
8. Company age	.02	.08	.02	-.10	.09	.09	.50**	1	.42**	-.02	-.09	.03
9. Coopetition experience	.16*	.07	.20**	.04	.17**	.11	.20**	.43**	1	.14*	-.04	.06
10. Coopetition structure	.48**	.21**	.73**	.19**	.45**	.17**	.03	-.01	.15*	1	.13.	.09
11. CMKTPOC[a]	.17**	.14*	.17**	.22**	.20**	-.04	-.09	-.08	-.03	.14*	1	.12
12. Industry type	-.07	.11	.03	-.00	-.02	.04	-.02	.04	-.05	-.08	-.11	1

Correlation is significant at the 0.05 level; **Correlation is significant at the 0.01 level; CMV adjustment above diagonal; Original correlations below diagonal; [a]Collaboration with other market players.

According to Malhotra et al. (2006), relationships are affected by CMV if originally significant correlations become nonsignificant after CMV adjustment. From table 6.13, it can be seen that the statistical significance of the CMV-adjusted correlations were not very different from the original correlations. In other words, the majority of the originally significant correlations remained significant even after accounting for CMV. This indicates that the extent of method bias in the data is so small that its effect on the estimated correlations is negligible (Malhotra et al., 2006). Moreover, the fact that the conceptual model includes interaction effect paths is further evidence that method bias was not of major influence in this study as it is unlikely that respondents could form mental models of the relationships examined (Podsakoff et al., 2003).

6.9 Chapter summary

Having gotten a picture of the scales in the previous chapter, this chapter proceeded to assess validity of the measures. To this effect, a rigorous approach was undertaken. First, exploratory factor analysis was conducted to identify the factor structures for a set of variables. Following this was an examination of internal consistency of the measures used. An assessment of the item-to-total as well as item-to-item correlations reveal that internal consistency of the measures was achieved and hence the measures are reliable. Subsequently, a confirmatory factor analysis was employed to assess convergent and discriminant validity of the measures. Evaluation of the calculated Cronbach alpha, composite reliability and average variance extracted scores reveal reliability and validity of the measures.

Chapter 7 : Research findings

7.1 Introduction

Following on the satisfactory assessment and validation of measures in the previous chapter, results of the hypotheses tests are presented in this chapter. Structural equation modelling results using maximum likelihood estimation method in LISREL 8.5 (see chapter 4 for details on the underlying assumptions of these) are presented. In addition, post hoc analysis SPSS 23 results are also presented and discussed. The chapter then concludes with a summary on the results.

7.2 Hypotheses testing procedures

As chapter four (section 8.3) guides, the study adopted the structural equation modelling (SEM) approach using the Linear Structural Relations (LISREL) software package to examine the relationships between the study constructs. Unlike other methods, SEM is considered the preferred causal modelling method for this study because it not only provides a comprehensive means for assessing and modifying the theoretical model but also allows the study to estimate and account for both systematic and random errors (Anderson and Gerbing, 1988; Bagozzi and Yi, 2012). In addition, Regression analysis using SPSS is employed to enhance the analysis and findings of the study.

It should be noted that composites of the scales created from mean values of the purified indices for the latent constructs were used to test the hypotheses while mean values of the single indicant of each of the first order constructs were used for the two second-order constructs in this study. To test the interaction hypotheses, the multiplicative approach was adopted where, after mean centering, each of the

moderators was multiplied by the independent variable to create single indicators of coopetition capability × coopetition learning process (COPCLP) and coopetition capability × institutional support (COPINST). See chapter six for a detailed discussion on the creation of the measurement index.

Having generated single item composite scores, the study then followed the approach recommended by Ping (1995) and practiced by other marketing scholars (e.g., Katsikeas et al., 2009; Robson et al., 2008; Boso et al., 2013) to estimate the error variances (EVs) for single indicants and single interaction terms. Accordingly, error variances for the composites were set to $[(1-\alpha) \times \sigma^2]$, where α is the construct reliability, and σ is the scale standard deviation (Joreskog and Sorbom, 1982). For the second-order variables, an index of the higher-order construct was computed using the average EVs of the lower order constructs. The Ping (1995) equations were used to compute the item loadings and EVs of the interaction terms. Consequently, four models were estimated and compared using the hierarchical approach.

All four models had coopetition capability, coopetition performance and financial performance as the dependent variables. In the first model, only the impact of control variables (firm age, firm size, coopetition experience, coopetition structure, and collaboration with other market players) on each of the dependent variables was estimated. Model 2 had control variables and main effect variables (i.e. managerial ties, coopetition learning process and institutional support on coopetition capability, coopetition capability on coopetition performance; and coopetition performance on financial performance). The third model estimated the impact of control variables, main effects and direct effects of the moderators on the dependent variables. In the last model all the variables (controls, main effects and interactions) were freely estimated.

The models were compared with the last model to observe variations in the fit statistics. Table 7.1 displays fit indices of the four models while appendix 7A presents detailed LISREL output of the models.

From table 7.1, it can be seen that the normed chi-square value for model 4 (χ^2/df = 1.62) is significantly smaller compared to that of model 1 (4.14), model 2 (1.86) and model 3 (1.68). This shows that model 4 provides a significant improvement in model fit relative to the other models. Similarly, fit indices for model 4 are better than those for the other models (e.g., RMSEA = 0.05; SRMR =0 .03; NNFI = 0.96; and CFI = 0.99). This is also reflective of the fact that there is a significant difference between the chi-square values of model 4 and model 3, the second best model, ($\Delta\chi^2 = 6.7$; $\Delta df = 2$; $p < 0.05$) further indicating that model 4 is superior. Furthermore, model 4 explains 54% of the variance in coopetition performance, and 20% in financial performance, values that are substantially superior relative to the R^2 values for the other models (See appendix 7A). Taken together, it can be said that model 4 provides a significant improvement over the other three models and as such the study proceeds to use model 4 to assess the study's hypotheses.

Table 7.1: Fit indices for the estimated structural models

Models	X^2	DF	X^2/DF	p-value	RMSEA	SRMR	NNFI	CFI
Model 1: Controls	277.35	67	4.14	<0.01	0.11	0.06	0.80	0.93
Model 2: Controls plus main effects	111.56	60	1.86	<0.01	0.06	0.04	0.93	0.98
Model 3: Controls, main effects plus moderators as direct effects	97.16	58	1.68	<0.01	0.05	0.03	0.95	0.97
Model 4: Controls, Main effects, moderators as direct effects plus interactions	90.46	56	1.62	<0.01	0.05	0.03	0.96	0.99

7.3 Hypotheses testing results

Because the aim of the study was to establish the effect, whether positive or negative, of the variables being studied and hence all hypotheses are one directional, a one-tailed t-test is used to assess the magnitude and significance level of the estimated structural paths. Specifically, effects are considered significant at the 10%, 5% and 1% level if t-values are greater than 1.28, 1.65 and 2.34 respectively. Table 7.2 below displays path estimates for model 4. As can be seen from the fit statistics provided in table 7.2, the model provides a good fit to the data [χ^2 = 90.46; df. = 56. *P*-value = 0.0000; RMSEA = 0.05; SRMR = 0.03; NNFI = 0.96; and CFI = 0.99]. The section that follows next presents the findings of the hypotheses test.

Table 7.2: Results of structural equation estimates of the study's model

Path			Standardised estimate	t-value	Hypothesis
Managerial ties	→	Coopetition capability	0.16	3.04***	H1 accepted
Coopetition learning process	→	Coopetition capability	0.67	8.82***	H2 accepted
Institutional support	→	Coopetition capability	-0.13	-2.48***	H3 rejected
Coopetition capability	→	Coopetition performance	0.29	3.46***	H4 accepted
Coopetition performance	→	Financial performance	0.31	2.93***	H5 accepted
Coopetition capability X Coopetition learning process	→	Coopetition performance	-0.11	-1.97**	H6 rejected
Coopetition capability X Institutional support	→	Coopetition performance	-0.08	-1.51*	H7 rejected
CONTROLS					
Firm business experience	→	Coopetition capability	-0.05	-0.65	
Firm size	→	Coopetition capability	0.00	0.04	
Coopetition experience	→	Coopetition capability	0.06	0.83	
Collaboration with other market players	→	Coopetition capability	0.08	1.46*	
Coopetition structure	→	Coopetition capability	-0.02	-0.31	
Firm business experience	→	Coopetition performance	0.13	1.56*	
Firm size	→	Coopetition performance	-0.09	-1.28	
Coopetition experience	→	Coopetition performance	0.01	0.83	
Managerial ties	→	Coopetition performance	0.01	0.15	
Collaboration with other market players	→	Coopetition performance	0.07	1.22	
Coopetition structure	→	Coopetition performance	0.01	0.12	

Table 7.2. Results of structural equation estimates of the study's model (continued)

Path			Standardised estimate	t-value	Hypothesis
Institutional support	→	Coopetition performance	0.02	0.32	
Coopetition learning process	→	Coopetition performance	0.40	3.87***	
Firm business experience	→	Financial performance	0.18	1.69**	
Firm size	→	Financial performance	-0.19	-2.21**	
Coopetition experience	→	Financial performance	-0.00	-0.00	
Collaboration with other market players	→	Financial performance	-0.13	-1.89**	
Coopetition structure	→	Financial performance	0.02	0.28	
Fit Indices: **$\chi^2_{(56)}$ = 90.46, p = 0.00, RMSEA = 0.05, NFI = 0.97, NNFI = 0.96, CFI = 0.99, IFI = .99** ******P <0.01; **P < 0.05; *p < 0.10; α = critical t-values are 1.282, 1.645 and 2.325 for α = 0.10, α = 0.05, and α = 0.01 respectively.***					

7.3.1 Drivers of coopetition capability

The results show a significant positive association between managerial ties and coopetition capability ($\beta = 0.16$; $t = 3.04$; $p < 0.01$). In line with the study's expectation in H1, managerial ties positively affects coopetition capability.

The study hypothesises in H2 that high levels of coopetition learning process would lead to high levels of coopetition capability. The test for this yielded a significant positive result ($\beta = 0.67$; $t = 8.82$; $p < 0.01$). Thus H2 of the study is supported.

H3 is not supported in this study as a significant negative link between institution support and coopetition capability ($\beta = -0.13$; $t = -2.48$; $p < 0.01$) is shown. This means that higher levels of institutional support would lead to lower levels of coopetition capability contrary to the study's expectation of a positive association.

In a nutshell, results in this study indicate that while high levels of managerial ties and high levels of coopetition learning processes are associated with high levels of coopetition capability, high levels of institutional support would lead to low levels of coopetition capability. The results show that managerial ties and coopetition learning process positively drive coopetition capability while institutional support is a negative driver.

7.3.2 Performance outcomes

In terms of the performance outcomes of coopetition capability, the study hypothesised coopetition performance in H4. The results support H4 that coopetition capability is positively related to coopetition performance ($\beta = 0.29$; $t = 3.46$; $p < 0.01$). This is in line with the assertion that firms with high levels of coopetition capability are likely to have high levels of coopetition performance.

The study also provides support for H5 that coopetition performance is positively related to financial performance as the path between the two variables is both positive and significant ($\beta = 0.31$; $t = 2.93$; $p < 0.01$).

7.3.3 Boundary conditions of the relationship between coopetition capability and coopetition performance

The study argues in H6 that the interaction between coopetition capability and coopetition learning process is positively related to coopetition performance. However, the data presents surprising results. First, the results are significant at 5% but opposite to the direction of H6 ($\beta = -0.11$; $t = -1.97$; $p < 0.05$), indicating that the performance effects of coopetition capability are weakened with high levels of coopetition learning process. Thus, it is concluded that H6 is not supported. Second, the results show that coopetition learning process is also an antecedent to coopetition performance just like coopetition capability as earlier established. This is interesting as it suggests that coopetition capability and coopetition learning process do not complement each other as argued in H6 but rather substitute each other when it comes to their effect on coopetition performance.

In H7 the study argues that the interaction between coopetition capability and institutional support is positively related to coopetition performance. As shown in table 7.2, institutional support is positively but not significantly related to coopetition performance, hence ruling out the possibility of it being a direct driver of coopetition performance. Nevertheless, the interaction between coopetition capability and institutional support is negative and significantly related to coopetition performance ($\beta = -0.08$; $t = -1.51$; $p < 0.10$). Thus, H7 is not supported in this study. This means that contrary to expectation, the positive relationship between coopetition capability and coopetition performance is weakened when institutional support is high.

The nature of the effects at differing levels of coopetition learning process, institutional support and coopetition capability are plotted in figures 7.1 and 7.2 below. Figure 7.1 shows a negative interaction effect between coopetition capability and coopetition learning process in that coopetition performance is high at low levels of coopetition capability but high levels of coopetition learning process. This changes as levels of both coopetition capability and coopetition learning process increase together. As seen in figure 7.2 coopetition performance increases with high levels of coopetition capability but low levels of institutional support. On the whole, the two figures indicate that the two moderators weaken the coopetition capability–coopetition performance relationship.

Figure 7.1: Moderating role of coopetition learning process on coopetition capability-coopetition performance link

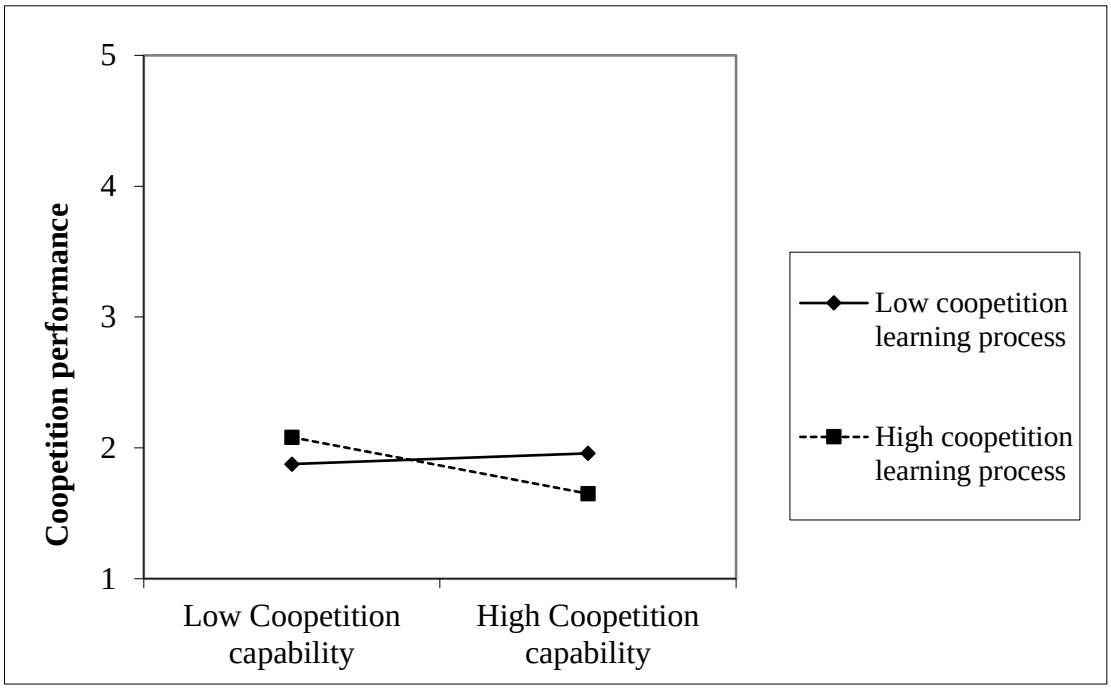
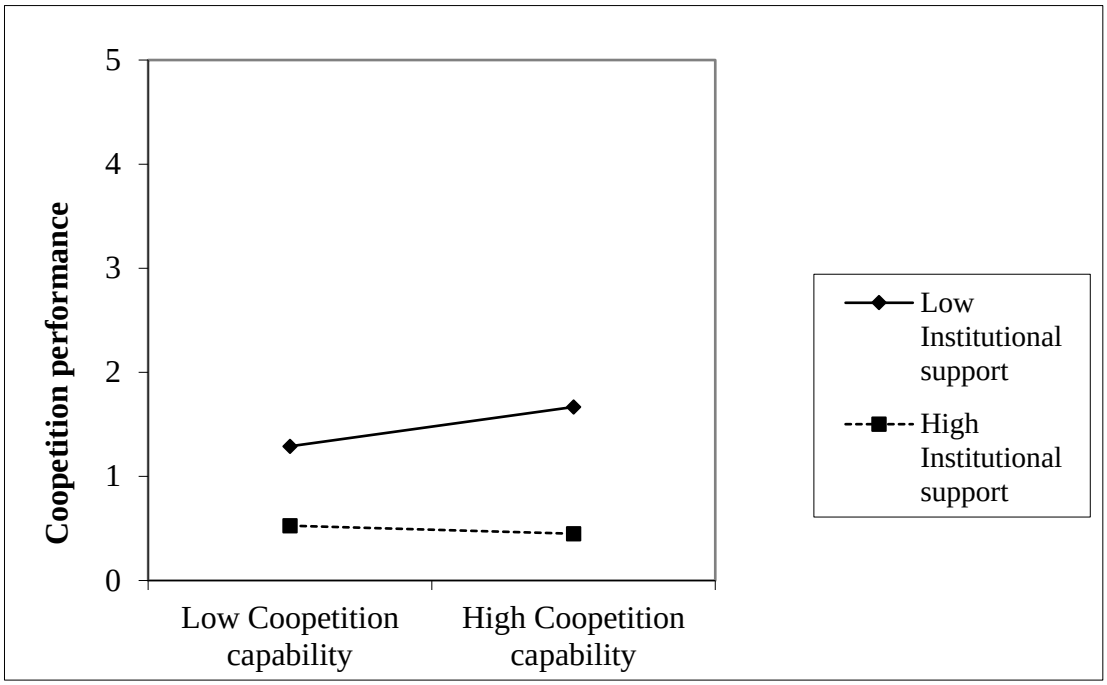


Figure 7.2: Moderating role of institutional support on coopetition capability-coopetition performance link



7.3.4 Control variables

The study also tested for the effect of a number of control variables on the three dependent variables in the model to provide clearer model specifications. The selection of these control variables for inclusion was guided by previous research, theory and the exploratory study. Although the results show that coopetition experience and coopetition structure exerted no statistically significant influence on all the outcome variables, six significant relationships were found in this study.

A positive relationship between collaboration with other market players and coopetition capability was established ($\beta = 0.08$; $t = 1.46$; $p < 10$). Two control variables: coopetition learning process and firm business experience had a positive effect on coopetition performance (($\beta = 0.40$; $t = 3.87$; $p < 0.01$) and ($\beta = 0.13$; $t = 1.56$; $p < 0.10$), respectively). While results show that firm business experience is positively related to financial performance ($\beta = 0.18$; $t = 1.69$; $p < 0.01$), collaboration with other

market players and firm size were negatively related to financial performance ((β = -0.13; t = -1.89; $p < 0.05$) and (β = -0.19; t = -2.21; $p < 0.05$), respectively).

Accordingly, it is concluded that the proposed relationships were verified with regard to the effect of the mentioned control variables.

7.4 Additional analyses

In order to increase robustness of the study's analysis and findings, further checks were conducted using SPSS 23. The additional checks included multicollinearity tests and sensitive analysis.

7.4.1 Replication in SPSS

In following Grewal et al's (2004) recommendation, multicollinearity test was conducted to assess the extent to which correlations amongst dependent variables understudy could have affected the relationships established in the model. To this effect, three regression models, for each of the three dependent variables: coopetition capability, coopetition performance and financial performance, were subjected to both Variance Inflation Factor (VIF) and tolerance test as recommended by Neter et al. (1985).

From table 7.3, it can be seen that multicollinearity was not an issue in this study as the tolerance and variance inflation factors scores are above 0.1 and below 10, respectively (Kahn, 2001; Kleinbaum et al., 1988). The lowest tolerance being 0.31 while the highest variance inflation factor score 3.22. Furthermore, the regression analysis path coefficients and significance levels (see appendix 7B) are analogous to those of the structural model LISREL results reported in table 7.2 and confirms that four hypotheses can be accepted whereas three hypotheses are rejected. Based on these findings, it can be concluded that the study results are not contaminated by the estimation technique employed and the robustness of the study's hypothesis findings can be confirmed.

Table 7.3: Collinearity statistics for the three independent variables

Dependent Variable: Coopetition capability							
Predictors	B	Std. Error	Beta	t-value	Sig.	Tolerance	VIF
(Constant)	1.92	.37		5.23	.00		
Firm business experience	-.03	.08	-.03	-.45	.65	.62	1.61
Firm Size	-.01	.05	-.01	-.19	.85	.74	1.35
Coopetition experience	.07	.08	.04	.82	.41	.77	1.29
Coopetition learning process	.46	.05	.62	8.92	.00	.45	2.20
Managerial ties	.12	.04	.15	2.97	.00	.92	1.09
Institutional support	-.07	.03	-.12	-2.37	.02	.90	1.11
Collaboration with other market players	.07	.05	.07	1.46	.15	.92	1.09
Coopetition structure	.00	.05	.01	.10	.92	.45	2.21
Dependent variable: Coopetition performance							
Predictors	B	Std. Error	Beta	t-value	Sig.	Tolerance	VIF
(Constant)	.55	.58		.95	.34		
Firm business experience	.20	.11	.11	1.85	.07	.62	1.61
Firm Size	-.08	.08	-.06	-1.04	.30	.74	1.36
Coopetition experience	.04	.12	.02	.36	.72	.76	1.32
Coopetition learning process	.41	.09	.40	4.84	.00	.34	2.93
Managerial ties	.01	.06	.01	.18	.86	.88	1.13
Institutional support	.02	.05	.02	.32	.75	.86	1.17
Collaboration with other market players	.09	.07	.07	1.44	.15	.91	1.10
Coopetition structure	.02	.06	.02	.28	.78	.45	2.23
Coopetition capability	.30	.10	.22	3.18	.00	.50	1.99
COPCXINST	-.07	.05	-.08	-1.58	.12	.94	1.07
COPCXCLP	-.10	.05	-.10	-1.96	.05	.83	1.20
Dependent variable: Financial performance							
Predictors	B	Std. Error	Beta	t-value	Sig.	Tolerance	VIF
(Constant)	2.86	.32		9.03	.00		
Firm business experience	.08	.06	.09	1.25	.21	.61	1.63
Firm Size	-.10	.04	-.15	-2.16	.03	.74	1.35
Coopetition experience	.02	.07	.02	.33	.74	.77	1.30
Coopetition learning process	.10	.05	.21	2.01	.05	.31	3.22
Managerial ties	.09	.04	.16	2.61	.01	.89	1.13
Institutional support	-.05	.03	-.11	-1.78	.08	.88	1.14
Collaboration with other market players	-.06	.04	-.11	-1.74	.08	.90	1.11
Coopetition structure	-.03	.04	-.07	-.80	.42	.45	2.21
Coopetition performance	.10	.04	.22	2.87	.01	.57	1.75
Coopetition capability	-.01	.05	-.02	-.22	.83	.51	1.97

7.4.2 Additional analysis on institutional support as a driver of coopetition capability

Considering the fact that the effect of institutional support was negative on coopetition capability contrary to H3, and in line with the notion that the effects of institutional factors may vary significantly depending on for example, a firm's industry type and size, the researcher conducted split group analysis on the institutional support as a driver of coopetition capability (Cai et al., 2010). The results for this analysis are not significant (see Appendix 7C).

7.4.3 Additional analysis on the coopetition capability–coopetition performance link

7.4.3.1 Coopetition capability and coopetition performance

The study finds support for H4 that coopetition capability as a composite has a positive and significant effect on coopetition performance. Further analysis was conducted to investigate how each of the coopetition capability dimensions is related to coopetition performance and to also establish the most influential dimensions. Table 7.4 shows that coopetition portfolio coordination, coopetition learning and proactiveness had positive and significant effect on coopetition performance. However, transformation was found to be positive but not significantly related to coopetition performance. Surprisingly, coopetition interfirm coordination was found to be negatively and not significantly related to coopetition performance. Therefore, it can be said that although the dimensions of coopetition capability collectively have a positive significant effect on coopetition capability, it is the coopetition portfolio coordination, learning and proactiveness dimensions which are conducive to coopetition performance.

Table 7.4: Effects of each of the dimensions of coopetition capability on coopetition performance

Dependent variable: Coopetition performance		
	Beta	**t-value**
(Constant)		
Experience – Age	.12	1.94**
Firm Size – Employees	-.06	-1.08
Number of Years Coopeting	.02	.39
CSTRUC	.23	3.76***
CMKTPOC	.10	1.85**
ICOORDC	-.01	-.20
PCOORDC	.29	4.09***
LEARNC	.08	1.31*
PROACC	.12	1.73**
TRANSC	.08	1.27

7.4.4 Additional insights on interactions (quadratic effects)

Considering the fact that both interaction relationships hypothesised did not yield any support in this study, the researcher undertook a number of additional analyses. Specifically, quadratic effects of the two moderators and that of coopetition capability on coopetition performance were assessed. To this effect, squared terms of the composites of institutional support and coopetition learning process were multiplied with coopetition capability, respectively, and regressed on coopetition performance. Results of this analysis did not yield any significant results (coopetition learning process × coopetition learning process × coopetition capability: $\beta = -0.02$; $t = -0.31$; $p < 0.05$ and institutional support × institutional support × coopetition capability: $\beta = 0.00$; $t = 0.19$ $p < 0.05$). Following these results, the study sticks to the interaction effect earlier found for H6 and H7.

The study also examined the possibility of coopetition capability to self-moderate to affect coopetition performance. Thus, although this study argues and finds support that

coopetition capability has a positive effect on coopetition performance, one could argue that very high levels of coopetition capability might be disruptive for coopetition performance. Accordingly, squared term of the coopetition capability composite (mean-centred) was regressed on coopetition performance. Results (β = -0.03; t = -.53; $p < 0.05$) show that the quadratic term of coopetition capability although negative, did not return significant path coefficients refuting any arguments that coopetition capability self-moderates in its relationship with coopetition performance.

7.5 Chapter summary

In this chapter, results of the seven hypotheses tests on the drivers, performance outcomes and boundary conditions of coopetition capability have been presented. In terms of the drivers, managerial ties and coopetition learning process positively drive coopetition capability while institutional support is a negative driver. A positive relationship is established between coopetition capability and coopetition performance and also between coopetition performance and firm financial performance. Institutional support and coopetition learning process negatively moderate the coopetition capability-coopetition performance relationship. These results are discussed in the next chapter.

Chapter 8 : Discussion and conclusion

8.1 Introduction

The aim of this chapter is to discuss the hypotheses testing results presented in the previous chapter. The chapter starts by discussing how the findings compare with the existing body of knowledge in interfirm relationship management. This is then followed by a presentation of the study's empirical contributions in terms of theoretical, managerial and policy implications. The chapter goes on to outline the limitations of this study and provides valuable avenues for future research.

8.2 Discussion of research findings

Interfirm relationships have today become an important part of business strategy for firms in an effort to cope with the faster business dynamics and high uncertainties resulting from market globalisation and aggressive economic competition. Extant scholarly strategy research provides evidence that interfirm relationships allow firms to take advantage of synergy effects including cost sharing, access to external resources and capabilities, to improve performance (e.g., Draulans et al., 2003; Dyer and Singh, 1998; Kale and Singh, 2007; Kogut, 1989; Schilke and Goerzen, 2010; Wang and Rajagopalan, 2015; Gnyawali and Park, 2009). However, the literature also indicates that interfirm relationships are fraught with difficulties such as misunderstandings, opportunism and appropriation concerns which can harm overall firm performance (e.g., Dyer and Singh, 1998; Kale and Singh, 2007; Schilke and Goerzen, 2010; Gnyawali and Park, 2009; Tomlinson and Fai, 2013; Fernandez et al., 2014). Given that interfirm relationships come with both benefits and costs, the literature indicates that firms that develop interfirm relationship management capabilities and competences are more likely to maximize the benefits of interfirm relationships and to contain its costs.

For example, the strategic alliance management literature provides evidence of how alliance management capability enables firms to deal with the opportunities and challenges of strategic alliances and succeed in alliances (e.g., Kale and Singh, 2007; Kale and Singh, 2009; Schilke and Goerzen, 2010; Sluyts et al., 2011). Within the context of coopetition, recognizing the challenges associated with cooperating with competitors, coopetition scholars have drawn attention to how coopetition capability may facilitate successful coopetitive relationships (e.g., Gnyawali and Park, 2011; Raza-Ullah et al., 2014; Bengtsson et al., 2016; Bengtsson and Johansson, 2014; Tidström, 2014; Fernandez et al., 2014; Gnyawali et al., 2016).

However, while the overall importance of managing interfirm relationships has been recognized in the broad interfirm cooperation literature, most extant works on the antecedents of interfirm relationship management capability have not only largely centered on a limited components of factors but have also not considered the boundary conditions of the performance outcomes of interfirm relationship management capability. In particular, the coopetition literature is unclear on how coopetition capability is defined and operationalized. Importantly, the literature is silent on how coopetition capability emerges, how it is related to firm performance and the key contingencies that may condition its performance consequences, thus limiting knowledge on how coopetition capability can be developed, and when it is beneficial to organisations. Against this background, this study set out to investigate the nature of coopetition capability as well as its drivers, performance outcomes and boundary conditions.

Guided by the resource-based theory and the dynamic capability view, the study defines coopetition capability as a firm’s ability to manage cooperative relationships

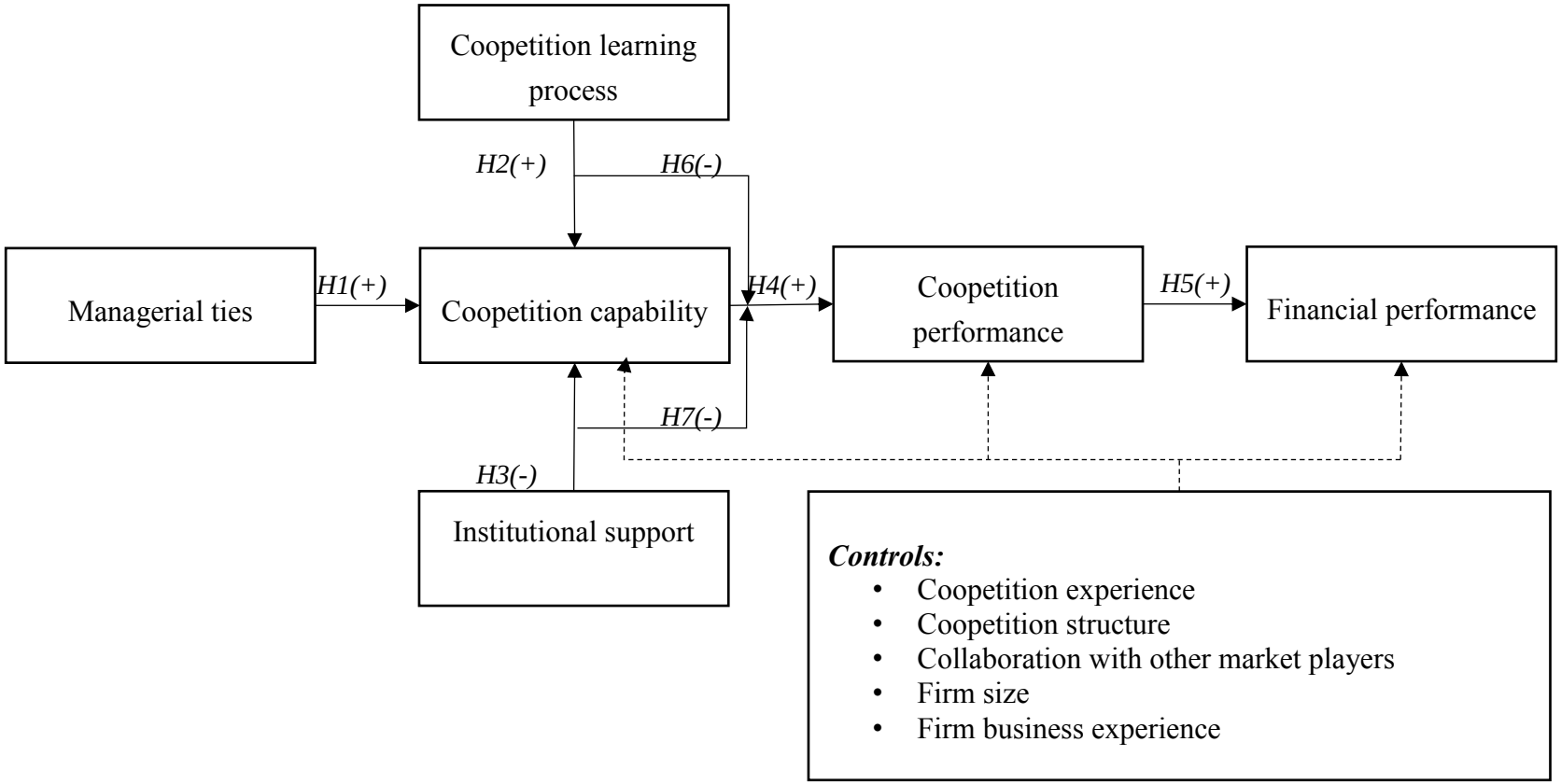
with its competitors in its industry (Gnyawali and Park, 2011). It is a higher-order dynamic capability construct, consisting of interfirm coopetition coordination, coopetition portfolio coordination, coopetition learning, coopetition proactiveness and coopetition transformation; aimed at integrating firm resources and functional capabilities in an attempt to adapt firms to market dynamics (Teece et al., 1997; Eisenhardt and Martin, 2000; Schilke and Goerzen, 2010; Wang and Ahmed, 2007). The five processes enable firms to not only internalize coopetitive relationship management knowledge but also knowledge from coopetitive partners in general (Heimeriks et al., 2004). In short, coopetition is construed as a firm capability that affords a firm the know-how and competences to manage its relationships with competitors.

The study proposed an antecedents-focal construct-consequence-contingency framework and statistically examined the meaning, drivers, consequences and contingencies of the coopetition capability phenomenon on 254 SMEs in a developing economy. While the study draws insights from the resource based view to understand the firm-specific drivers (managerial ties and coopetition learning process) and performance outcomes of coopetition capability (coopetition performance and subsequent financial performance), institutional theory informs the study how external institutional forces might drive firms' propensity to develop coopetition capability. Moreover, the contingency theory provides insights into how these external environments and firm specific resources condition the performance outcomes of coopetition capability.

In doing so, this research helps increase understanding of coopetition performance heterogeneity, that is, how some firms become successful in coopetitive relationships

and achieve superior performance while other firms do not. The understanding is that this capability to manage cooperative relationships with competitors accelerates a firm's access to and transfer of knowledge and other key resources embedded in its competitors which have relevant effect on company growth and competitiveness. In addition, by examining coopetition learning process and institutional support as boundary conditions of coopetition capability-performance relationship, this study contributes to reducing the scarcity of empirical research on contingencies that influence the efficacy of interfirm relationship management capabilities. Furthermore, the study's empirical findings provide managers and policy makers with implementable insights regarding management of cooperative relationships with competitors to enhance performance. Figure 8.1 below highlights the findings of this research which are discussed in the ensuing section.

Figure 8.1: Empirical model



***Note**: H1, H2, H4 and H5 are supported. H3, H6 and H7 are not supported*

8.2.1 Discussion of hypothesis 1: The effect of managerial ties on the development of coopetition capability

Despite years of scholarly discussion on the antecedents of dynamic capabilities, empirical research on the influence of managers on the development of dynamic capabilities remain thin in the literature (Eriksson, 2014; Barreto, 2010), especially with respect to the effect of managerial connections on interfirm relationship management capabilities. The study identifies and argues in hypothesis 1 that managerial ties are positively related with coopetition capability. Managerial ties in this study refer to the degree of social relations between managers in the focal firm and managers in other businesses, government and non-governmental officers in an industry (Li and Atuahene-Gima, 2001). Through these social relations, the study posits that firms gain not only access to external resources such as information but also knowledge and experience to effectively manage interfirm relationships. Thus, managerial ties are viewed as firm-specific resources (Barney, 1991a) that enhance interfirm relationship management competence which is generated from a manager's relationships with managers of other firms.

The results of the study reveal a positive association between managerial ties and coopetition capability ($\beta = 0.16$; $t = 3.04$; $p < 0.01$). In confirmation with the study's expectations, it appears that a manager's external ties with managers of other firms are critical firm resources that not only provide firms with unique resources but also act as mechanisms through which a manager interacts with others and learn interfirm relationship management routines. The fact that opportunity creation and discovery are not uniformly distributed among firms but to a large extent depend on the cognitive and creative capacities of managers (Teece, 2012; Augier and Teece, 2009), suggests that differences in managerial knowledge capacities can be a key source of variation in

firms' development of capabilities. As researchers have argued, managerial connections provide managers with business network knowledge which is essential for exploiting and shaping business opportunities (e.g., Lu et al., 2010).

Thus, it can be inferred from the findings that managerial ties is a critical precursor to coopetition capability as it allows managers to not only have a better understanding of the business ecosystem in their respective industries but also identify and explore partnering opportunities. Also, since external ties provide firms with information advantages about options for improving competitive capabilities (McEvily and Zaheer, 1999), it can be expected that managers with weak external connections are less likely to effectively assess and spot coopetitive opportunities nor have adequate know-how of interfirm relationship management routines. Furthermore, interactions among executives enhance managers' interfirm relationship management skills, competences, and experience, and thus firms transfer these skills to build coopetition capability. Indeed, as Augier and Teece (2009) submit, managerial experiences and skills account for an essential part of an organizational memory and can be a basis for ensuring a smooth functioning of organizational operations.

Although this study represents the first to investigate managerial ties in the context of coopetition (to the author's knowledge), the study confirms previous broader strategy studies that suggest managerial ties to have a significant influence on business strategy (e.g., Kotabe et al., 2011; Penrose, 1959; Zhang, 2007; Prévot and Spencer, 2006). Within the specific interfirm relationship context, this finding is in line with previous studies which emphasize the importance of managerial skills, commitment and experience as critical resources in the development of capabilities (e.g., Sluyts et al., 2011). In a more direct comparison, the study is consistent with Lu et al's (2010)

finding of a positive influence of managerial ties on a firm's ability not only to acquire information about market conditions but also to coordinate, recombine and allocate resources to meet the different requirements in foreign markets.

8.2.2 Discussion of hypothesis 2: The effect of coopetition learning process on the development of coopetition capability

Previous studies on interfirm relationship success suggest that learning mechanisms allow firms to develop superior knowledge about interfirm relationships and as such are critical interfirm relationship success factors. For example, in the area of alliances, scholars have found a positive relationship between alliance learning process and alliance success (e.g., Kale and Singh, 2007; Sluyts et al., 2011). However, Zollo and Winter (2002), in their influential conceptual work on dynamic capabilities suggest that a firm's learning process act as a basis for improving a firm's skills to manage those tasks effectively, and hint to learning mechanisms affecting performance through intermediate dynamic capabilities. Surprisingly, empirical research on the link between learning process and dynamic capabilities is hardly found in the literature.

To help address this gap, hypothesis 2 was put forward arguing for a positive link between coopetition learning process, defined as internal processes that help a firm learn, accumulate and leverage coopetition management know-how and best practices (Kale and Singh, 2007), and coopetition capability. Drawing on insights from the resource based view, the study postulates that coopetition learning process is a critical firm specific resource, difficult to imitate, that enhances the development of coopetition capability on the basis of creating and integrating coopetition knowledge within a firm. Accordingly, in line with previous strategy studies (e.g., Kogut and Zander, 1992; Zollo and Winter, 2002; Kale and Singh, 2007; Sluyts et al., 2011) the effect of four types of

learning mechanisms: articulation, codification, sharing and internalisation (as an aggregated construct (Kale and Singh, 2007)), on coopetition capability was tested.

Results reveal a significant positive association between coopetition learning process and coopetition capability ($\beta = 0.67$; $t = 8.82$; $p < 0.01$). As anticipated and in line with Zollo and Winter's (2002) suggestion of the learning process as an antecedent to dynamic capabilities, coopetition learning process drives the development of coopetition capability in the SME firms studied. This finding refines earlier results on the direct positive effect of learning processes on interfirm relationship success (e.g. Draulans et al., 2003; Kale and Singh, 2007; Sluyts et al., 2011; Heimeriks and Duysters, 2007; Hoffmann, 2005) and supports Schilke's (2014b) finding that the learning process also affects performance through its effect on dynamic capabilities.

As argued by Zollo and Winter (2002), learning mechanisms allow firms to generate and integrate coopetition knowledge and this process helps improve a firm's ability to manage coopetitive relationships. By articulating, codifying, sharing and internalizing coopetition knowledge, organisational members are likely to be aware of the standards, goals and targets in dealing with coopetitors (Kale and Singh, 2007). Additionally, greater coopetition learning triggers greater intra-organisational communication, allowing firms to respond more swiftly and effectively to coopetitive demands and aptly restructure their coopetitive relationships to improve a firm's coopetition management capability base.

Although the study found a positive effect of the aggregated construct in line with previous studies (e.g., Kale and Singh 2007), post hoc analysis was conducted to provide further insights on the influence of the individual learning dimensions on

coopetition capability. The results reveal that only two dimensions of the learning process have a significant positive effect on coopetition capability, namely; articulation and sharing. Codification and internalisation do not have a significant effect on coopetition capability. In fact, results show that the two are negatively related to coopetition capability. These findings suggest that although the aggregate of the four coopetition learning mechanisms is positively associated with coopetition capability, not all of them are beneficial for coopetition capability.

8.2.3 Discussion of hypothesis 3: The effect of institutional support on the development of coopetition capability

In drawing insights from institutional theory of the firm which postulates that institutional prescriptions and norms shape the nature of economic activity as they regulate and motivate the behaviour of actors in a given environment (Lau et al., 2002; Scott, 2005; DiMaggio, 1994; North, 1990), along with insights from the field study interviews with senior managers, hypothesis 3 was formulated on the basis of the argument that institutional support in terms of government support and incentives motivates a firm's ability to manage cooperative relationships with competitors. This argument is also in line with previous studies on the role of institutions in interfirm relationships that suggest a positive link between institutional support and interfirm relationships (e.g., Mariani, 2007; Cai et al., 2010). Accordingly, a positive relationship between institutional support and coopetition capability was anticipated in this study.

Surprisingly, findings from the study reveal a significant negative association between institutional support and coopetition capability ($\beta = -0.13$; $t = -2.48$; $p < 0.01$). Although contrary to the study's expectation, two points are worth drawing from the findings. First, the fact that institutional support is significantly related with coopetition capability provides empirical evidence to previous studies on the influence of

institutions on the strategic decisions and actions of firms in a given environment, including in developing economies such as Zambia (Bruton et al., 2010; Fligstein, 1996; Grewal and Dharwadkar, 2002; North, 1990; Granovetter, 1985; Oliver, 1997). Second, the negative link between institutional support and coopetition capability is not only contrary to the study's expectation but also contrasts that of Cai et al. (2010) where government support was found to positively influence information sharing and collaborative planning. Two possible explanations for the discrepancy in the findings can be given.

First, while this study examined the role of institutional support on collaborative relationships in the context of coopetition, the Cai et al. (2010) study examined the influence of institutional support in buyer-supplier interfirm relationships, which is vertical in nature. Thus, the differences in the context being studied could account for the discrepancy. It could be that horizontal coopetitive relationships are more complex and riskier compared to vertical buyer-seller relationships, as they involve rival firms working together, hence, firms find institutional support as a substitute mechanism for coopetition and so are likely to invest less in the management of coopetitive relationships. Since the ultimate aim for pursuing coopetition is to pool resources together (Luo et al., 2007; Gnyawali and Park, 2011), institutional support may be used as a gateway to external resources which firms could otherwise access in coopetition. The fact that coopetition is often viewed as a complex, costly and risky undertaking (Bengtsson and Kock, 2000; Gnyawali and Park, 2009; Pellegrin-Boucher et al., 2013; Bouncken and Fredrich, 2012), institutional support could be more appealing to pursue than coopetitive relationships. This seems more reasonable particularly for firms operating in developing economies where contractual disputes and partner opportunism are likely to be high due to weak, inefficient and ineffective institutions (Manolova et

al., 2008; Xu and Meyer, 2013). Conversely, when institutional support is low, firms are more likely to depend on coopetition to access resources and as such will invest more in the development of coopetition capability so as to succeed in those relationships. Relatedly, previous studies on the role of institutions in developing economies report that in view of under-developed market supporting institutions and given that valuable resources are hard to come by in such markets, firms in developing economies largely rely on interfirm relationships and external networks to access critical resources (e.g., Hitt et al., 2004; Boso et al., 2013; Lu et al., 2010). Thus, it seems logical to attribute the negative association between institutional support and coopetition capability to a substitution effect of institutional support and the tenets of coopetition activity.

Second, the size of firms investigated is likely to be another reason for the variance in the findings of the two studies. Whereas this study examined SMEs, Cai et al's (2010) study investigated medium to large enterprises. It could be that the effect of institutional support on coopetition capability is contextual as regards to firm size. Smallbone and Welter (2001) argue that government policies may have differential impact on firms of different sizes because of the differences of circumstances, such as number of employees and financial resources that these firms may have. A plausible explanation for this logic could be that since developing capabilities requires resources and people (Kale et al., 2001), firms need to be large enough and have sufficient resources necessary for the development of coopetition capability as such high institutional support may lead to lessdevelopment of coopetition capability in smaller firms.

On the whole, this empirical finding broadens and deepens understanding on the influence of institutions in shaping firm behaviour by explicitly showing that strategic decisions and actions of firms are significantly influenced by the institutions in a given environment. It seems institutional support in Zambia inhibits the development of coopetition capability.

8.2.4 Discussion of hypothesis 4: The effect of coopetition capability on coopetition performance

The literature indicates that coopetitive relationships are often characterised with fraught difficulties such as conflicts, tension and opportunism, which impede success in coopetitive relationships (Bengtsson et al., 2016; Gnyawali and Park, 2009; Tomlinson and Fai, 2013; Bouncken and Kraus, 2013). In light of this, coopetition scholars have drawn attention to success factors in coopetitive relationships, pointing to coopetition capability as one of them. For example, the recent study by Bengtsson et al. (2016) found that coopetition capability enables firms to maintain a moderate level of tension. Similarly, Gnyawali et al. (2016) rely on evidence from few cases of firms to identify capabilities necessary for an effective management of coopetitive relationships. To an extent that coopetition studies suggest the importance of coopetition capability to coopetition success, empirical research investigating the direct link between coopetition capability and coopetition success is rare in the literature as such, little is known about the relationship.

This study argues in hypothesis 4 for a positive direct association between coopetition capability and coopetition performance (the performance of coopetitive relationships in terms of strength and harmoniousness of the relationships as well as primary objectives in forming the relationships being achieved). Drawing from previous theoretical frameworks, interfirm relationship literature and insights from exploratory interviews,

coopetition capability is conceptualised as a higher-order five dimensional construct consisting of interfirm coordination, portfolio coordination, learning, proactiveness and transformation (Schilke and Goerzen, 2010; Teece et al., 1997; Wilden et al., 2013). The study posits that these five elements of organizational routines, acting as a coherent package (Wilden et al., 2013) are the key mechanisms by which SMEs are able to effectively manage coopetitive relationships.

In support of hypothesis 4, a significant positive link between coopetition capability and coopetition performance is established ($\beta = 0.29$; $t = 3.46$; $p < 0.01$). As anticipated and consistent with previous theoretical suggestions and findings developed within the domains of the dynamic capabilities of firms and strategic alliances (e.g., Teece et al., 1997; Leischnig et al., 2014; Schilke and Goerzen, 2010; Schreiner et al., 2009; Heimeriks and Duysters, 2007) coopetition capability enhances coopetition performance as it helps firms to effectively manage coopetitive relationships. More specifically, the study validates Schilke and Goerzen's (2010) results of a positive link between alliance management capability and alliance portfolio performance.

In terms of the effects of the individual dimensions, post hoc results show that coopetition portfolio coordination, learning and proactiveness had positive and significant effect on coopetition performance. However, transformation was found to be positive but not significantly related to coopetition performance. Surprisingly, coopetition interfirm coordination was negatively and not significantly related to coopetition performance. It can therefore be argued that although the dimensions of coopetition capability drive coopetition performance differentially, beyond the independent effects of the coopetition capabilities, their complementary and joint effects help drive coopetition performance. In short, it is their overall existence that

affords firms value as opposed to their individual existence because the interaction between the five capabilities increase a firm's coopetition relationship effectiveness, as well as limit competitors' ability to successfully copy this capability. Thus, the presence of one element of the coopetition capability may help accentuate the efficacy of another capability in driving coopetition relationship effectiveness.

8.2.5 Discussion of hypothesis 5: The effect of coopetition performance on financial performance

Although a relatively large body of research theoretically asserts a positive relationship between coopetition and firm performance (e.g., Bengtsson et al., 2010; Bouncken and Kraus, 2013; Gnyawali and Park, 2009; Peng et al., 2012; Ritala, 2012; Wu, 2014), fewer empirical studies demonstrate it using multiple and varied firm performance measures. An inspection of the literature indicates that the majority of the studies have focused on innovation performance to the neglect of other firm performance measures such as financial and market performance measures. A critical review of the studies also indicates ambivalences in the coopetition-performance relationship. For example, while Ritala (2012) found that coopetition was beneficial to innovation performance, Bouncken and Kraus (2013) found that coopetition triggered radical innovation, but at the same time harmed revolutionary innovation. Yet, Tomlinson and Fai (2013) found that coopetition had no significant impact upon innovation. On other firm performance measures, Luo et al. (2006) found that coopetition had a positive impact on customer and financial performance while Oum et al. (2004) found that it had a positive influence on firm productivity but no effect on profitability.

Nonetheless, in viewing coopetition as an exchange relationship of resources and capabilities between competitors, the study draws from the RBV arguing for a positive association between coopetition performance and financial performance in hypothesis

5. The assumption is that successful coopetitive relationships represent valuable, rare and non-imitable resources and capabilities that are used to improve financial performance. The results provide support for this association ($\beta = 0.31$; $t = 2.93$; $p < 0.01$).

As anticipated, successful coopetitive relationships are likely to lead to superior performance because a firm in successful coopetitive relationships is likely to have access to potentially valuable resources and opportunities such as market information, financial means and market entry relative to competitors. This is because firms in coopetition are able to reap a variety of benefits such as access to competitors' resources and capabilities that may not even be exchanged in the factor market as they are either mingled with other resources or embedded in interfirm routines and processes. Although coopetitive relationships are risky and challenging (in terms of high failure rate, instability and opportunism for example), a firm in coopetition is likely to have optimal gains and even control larger share of the market compared with a situation in which the firm was to solely compete (Luo et al., 2007).

While the link between coopetition performance and financial performance is largely underexplored in the coopetition literature, the value of external-firm resources accessed through interfirm relationships has been well documented in the literature (Luo et al., 2007; Bouncken and Kraus, 2013; Gnyawali and Park, 2009; Peng et al., 2012; Ritala, 2012; Brito et al., 2014; Zeng et al., 2010). For example, Brito et al. (2014) found cooperation with suppliers and customers has a positive effect on firm growth and profitability. In the specific area of cooperation with competitors, Luo et al. (2007), and Jiang et al. (2010) found that alliances with competitors is positively related to financial performance. In the context of small and medium-sized firms,

Morris et al., (2007) provides evidence that coopetition enabled Turkish SMEs to mitigate risk and leverage resources. Therefore, the results in this study of a positive relationship between coopetition performance and financial performance affirm those earlier studies in interfirm relationships and highlight the importance of success in coopetitive relationships to financial performance which includes cost and risk sharing, joint opportunity exploitation, access to a variety of competitors' skills, knowledge, resources and capabilities in various value chain activities. A firm with high coopetition performance is well able to effectively develop new and unique products and services, serve multiple and diverse market demands (Gnyawali and Park, 2009) and as such increase sales and profits to achieve superior financial performance.

8.2.6 Discussion of hypothesis 6: The interacting effect of coopetition learning process on the coopetition capability-coopetition performance relationship

There is consensus in the literature that both the learning process and alliance management capability are positively related to alliance performance. However, studies examining the complementary value of the two mechanisms are rare in the literature. To address this gap, hypothesis 6 in this study predicts that coopetition learning process and coopetition capability share a complementary relationship in that the value of the latter increases in firms with high levels of the former. Given that firms with high levels of learning processes are more likely to engage in systematic efforts to articulate, codify, share and internalise coopetition experiences and lessons into firm-wide coopetition know-how, the effectiveness of the coopetition management mechanisms that underlie the five aspects of coopetition capability would be further enhanced in firms where there are high levels of coopetition learning process.

However, while the study found that coopetition learning process positively drives coopetition capability in hypothesis 2, the results for the moderating role of coopetition

learning process are surprising. Contrary to the study's expectations, coopetition learning process appears to weaken the positive effect of coopetition capability on coopetition performance. This defeats the study's argument that the two resources: coopetition learning process and coopetition capability, complement each other to enhance coopetition performance.

The negative moderating effect of coopetition learning process on the relationship between coopetition capability and coopetition performance is intriguing as it suggests that although coopetition capability enhances coopetition performance, the incremental value of investing in such a capability diminishes in firms with high levels of coopetition learning process. A plausible explanation to this finding is that coopetition learning process could be a substitute for coopetition capability supporting Schilke's (2014b) finding of a negative interaction between alliance learning and alliance management capability. Kale and Singh (2007) and Sluyts et al. (2011) conceptualised the learning process as a higher-order interfirm relationship management capability and found a positive effect of learning process on interfirm relationship performance. In fact, although not hypothesised, the study finds that coopetition learning process as a control variable has a positive significant effect on coopetition performance. Therefore, the negative interaction effect between coopetition capability and coopetition learning process on coopetition performance indicates that coopetition capability mechanisms and coopetition learning processes are substitutable with the latter, although being an organisational process, equivalent of a management capability. As such, investing in both resources takes away scarce managerial resources and attention needed for coopetition performance.

Another plausible explanation could be that it is difficult to effectively manage coopetitive relationships in firms with high levels of formalized learning processes. Since the learning process assumes that firms need to follow a predefined approach, make decisions based on precedence, common practice and past experience within a firm (Kale and Singh, 2007), it may limit a firm's ability to use common knowledge and/or creativity to swiftly act or make a decision on coopetitive relationships. For example, because of codification, managers become less creative in their decision making as they are supposed to go by the existing guidelines and checklists (Kale and Singh, 2007). However, as Bouncken and Kraus (2013) submit, coopetitive relationships are complex characterised with high risks and uncertainties and so might require a totally different approach from what has been practiced in the past. In short, coopetition learning process may be less useful to the coopetition capability-coopetition performance because of its formalisation, and inflexible approach to strategic decision making and action.

8.2.7 Discussion of hypothesis 7: The moderating effect of institutional support on the coopetition capability- coopetition performance relationship

While studies investigating the relevance of dynamic capabilities under conditions of varying environmental factors are rare in the literature, the few available studies that examine contingencies of dynamic capabilities mainly focus on varying task environmental conditions (Barreto, 2010; Ambrosini and Bowman, 2009). The role of institutions as a contingency remains unexplored in the dynamic capabilities literature. Yet, structural change in organisations is not only driven by the task forces of competition, dynamism, and munificence but also by adherence to the wider set of rules and laws in the institutional environment (Meyer and Rowan, 1977). Thus, building on the institutional theory and contingency view, a case was made in hypothesis 7 for

institutional support moderating the effectiveness of coopetition capability on coopetition performance.

The study predicted that coopetition capability would have the strongest impact on coopetition performance in environments with high levels of institutional support, whereas its impact would be weaker in environments with low levels of institutional support. The logic being that when institutional support is high, firms are more motivated to share resources and capabilities and to exploit the ample resources and business opportunities in coopetitive relationships. On the contrary, coopetitive partners are more likely to act opportunistically and breach contract terms, withhold information and other resources in institutional environments with low support (Lui et al., 2009). This weakens the coopetition capability-coopetition performance relationship in such environments.

However, this argument was not supported by the data in this study ($\beta = -0.08$; $t = -1.51$; $p < 0.10$). Contrary to the study's expectations, the findings indicate that the effects of coopetition capability on coopetition performance decrease under environments with high levels of institutional support. Given that the moderating relationship hypothesised did not yield any support in this study, the researcher examined the quadratic effects of institutional support and coopetition capability on coopetition performance in a post hoc analysis, on the basis of the assumption that above-average levels of institutional support would enhance the coopetition capability-coopetition performance relationship. Accordingly, the squared term of the composite of institutional support were multiplied with coopetition capability and regressed on coopetition performance. However, results of this post hoc analysis also failed to provide support for the positive moderating effect of institutional support. Following

these non-significant results, the study proceeds with the finding that coopetition capability's effect on coopetition performance is weakened at increasing levels of institutional support.

Although contrary to the study's prediction, and marginally significant ($p < 0.10$), this finding provides support and contributes to the debate that the benefits of dynamic capabilities may depend on the institutional context in which capabilities are deployed (e.g., Schilke, 2014a; Sirmon and Hitt, 2009). A possible explanation for the negative interaction effect between institutional support and coopetition capability on coopetition performance is that firms devote their energies on accessing the available institutional support at the expense of investing enough resources to enhance the performance outcomes of coopetition capability. Pursuing institutional support may consume a lot of time and this may compromise a firm's effort to manage coopetitive relationships. It has been argued that despite the availability of institutional support in developing economies, such supports may not be very functional and difficult to access due the bureaucratic and tedious process firms have to go through to obtain such supports (Sheng et al., 2011). It is noted that firms need strong political connections to be able to access institutional supports (such as tax benefits) in developing economies (Wu et al., 2012).

This study reasons therefore that an increase in institutional support at an intermediate level may not alter the relationship between coopetition capability and performance because unrestricted links to weak and potentially dysfunctional governmental institutions may degenerate to suggestions of unethical behaviour and corruption among collaborating rival firms which might not help the coopetition relationship's effectiveness in the long-run. More importantly, institutional support in developing

economies tend to be highly politically tainted, to the extent that government officials managing such supports may expect funding from firms in return for continued institutional support without necessarily having the interest of the firm at heart (Oliver and Holzinger, 2008); hence unconstrained reliance on institutional support may just be a short-term fix rather than a long-term strategic choice. Against this backdrop, Luo et al. (2008) argue that limitless political connections with the objective of accessing institutional support is an indication of poor strategic decision making, arguing that rather greater political lobbying, firms should rather commit resources and efforts into building and maintaining strong business partnerships. This is because building long-term trusted relationships with partners (in this case competitors in the same industry) may enable firms to better understand market problems and how these are solved in cooperation with competing industry players.

Another possible explanation is that while institutional support may be aimed at stimulating collaboration among firms as revealed in the qualitative field interviews, the negative interaction effect could mean that high levels of institutional support is counterproductive in that firms feel they are entitled to such support and are not pushed to live by the conditions attached to the support but rather can even benefit from more support whenever they faced challenges. As Carter and Wilton (2006) note, government interference with business operations especially by way of ‘handouts’, may not be the best as it could create a dependence syndrome on firms. Too much government support is likely to make firms invest less in coordinating interfirm relationships nor be more proactive in identifying coopetitive relationships and thus compromise the effectiveness of managing the relationships and this negatively affects coopetition performance. On the contrary, coopetition capability is of importance for performance in environments with low institutional support because firms are more

likely to invest all their energies in ways of enhancing their coopetitive relationships. In line with Mesquita and Lazzarini's (2008) argument that interorganisational collaborations are critical for SMEs in environments characterised by weak infrastructure and institutional support such as in most developing economies, it is reasonable to suggest that coopetition capability would be more effective for coopetition performance in environments with low institutional support.

8.2.8 Discussion of the effect of controls on the outcome variables

The study also tested for the effect of a number of control variables on the three dependent variables in the model, namely coopetition capability, coopetition performance and financial performance to provide clearer model specifications. The selection of these control variables for inclusion was also guided by previous research, theory and the exploratory study. Results show that coopetition experience and coopetition structure exerts no statistically significant influence on all the outcome variables (coopetition capability, coopetition performance and financial performance) in this study.

However, collaboration with other market players has a positive effect on coopetition capability ($\beta = 0.08$; $t = 1.46$; $p < 10$). Coopetition learning process and firm business experience positively influence coopetition performance (($\beta = 0.40$; $t = 3.87$; $p < 0.01$) and ($\beta = 0.13$; $t = 1.56$; $p < 0.10$), respectively). While results show that firm business experience is positively related to financial performance ($\beta = 0.18$; $t = 1.69$; $p < 0.01$), as anticipated, surprisingly collaboration with other market players and firm size are negatively related to financial performance (($\beta = -0.13$; $t = -1.89$; $p < 0.05$) and ($\beta = -0.19$; $t = -2.21$; $p < 0.05$), respectively).

While all the above results provide clearer model specification as results in this study are verified with regard to the effect of the mentioned control variables, the negative effect of collaboration with other market players and firm size on financial performance are not only contrary to previous findings but also intriguing. Although most researchers agree that collaboration with other market players should improve economic outcomes of firms (e.g., Uzzi, 1996; Peng and Luo, 2000; Sheng et al., 2011), evidence in this study shows that this is not always the case. As Li et al. (2008) suggest, extensive use of external relations may lead to firms being trapped by the relationships and become less effective in adapting to market changes and result in poor performance. The finding of a negative association between firm size and financial performance is similar to Ramasamy et al. (2005) finding and suggests that having too many employees might lead to diminishing returns. Saturation effects may occur because there seems to be a natural limit to the overall number of employees that a firm can support successfully.

In the next section, a discussion on how this empirical study contributes to knowledge is presented. Insights into the theoretical and practical implications of the findings are expounded.

8.3 Theoretical implications

Several implications can be drawn from the study findings for theory in the business strategy literature in general and the institutional, dynamic capabilities and coopetition literatures in particular. Drawing from the RBV, dynamic capabilities, institutional theory and contingency theory, the study empirically tests and uncovers the conceptual domain of coopetition capability, factors that facilitate its development, its performance

outcomes as well as its boundary conditions. The following sections highlight the key aspects of the findings and their theoretical and methodological implications.

First, the study reveals that coopetition capability is a dynamic capability that involves deliberate efforts of coopetition interfirm coordination, coopetition portfolio coordination, coopetition learning, coopetition proactiveness and coopetition transformation. Altogether, the routines allow firms to effectively manage their coopetitive relationships and to optimise their coopetition performance and succeed in such relationships. Success in coopetitive relationships enables firms to benefit from access to potentially valuable resources and opportunities such as market information, financial means and market entry relative to competitors and in turn achieve superior financial performance. This study therefore provides a solid foundation on which coopetition scholars can build on to further understand coopetition success.

Second, this research uncovers knowledge on the drivers of the development of coopetition capability. Whereas most extant work on the drivers of dynamic capabilities has largely centred on the organisational level antecedents, the few that is available only conceptualises (e.g., Teece, 2007) but does not empirically examine individual level antecedents of dynamic capabilities, this study extends research on the subject by examining the influence of managerial ties on coopetition capability in response to calls for such investigations (e.g., Eriksson, 2014; Barreto, 2010). The results confirm that managerial ties is a key driver for the development of coopetition capability. These ties not only provide managers with information advantages but also help enhance managers' interfirm relationship management skills and experience, which are important inputs to the development of management of coopetitive relationships. With less external ties, a manager's understanding of and experience in

interfirm relationship routines such as coordination and learning is limited and this hampers on their ability to manage coopetitive relationships which are even more challenging. This study therefore broadens and deepens understanding of the capability-building notion which emphasizes the importance of organisational resources in the development of dynamic capabilities (Helfat and Peteraf, 2003). More specifically, the findings highlight the importance of individual level firm-specific resources such as managerial skills, competences, experience and connections in the development of dynamic capabilities.

Third, while the majority of empirical research have examined learning process as a direct antecedent to interfirm relationship performance (e.g., Sluyts et al., 2011; Kale and Singh, 2007), this study advances knowledge by demonstrating that coopetition learning process is also a significant positive driver of coopetition capability to lead to coopetition performance. Thus, the study extends earlier results of a direct positive effect of the learning process on interfirm relationship success in the sense that learning mechanisms could also improve interfirm relationships through their effect on interfirm relationship management capabilities. Coopetition learning mechanisms which include articulation, codification, sharing and internalisation allow firms to share lessons learned including past mistakes, and to have guidelines in coopetition internally which in turn improves skills and competences in managing coopetition thereby enhance coopetitive relationships.

The other notable contribution of this study is the relevance of institutions in the development of coopetition capability. While previous studies have done a commendable job in terms of examining how firm-specific factors (e.g., Kale and Singh, 2007; Sluyts et al., 2011; Schilke and Goerzen, 2010) can impact the

development of interfirm relationship management capabilities, this study uncovers how institutions in a firm's environment may promote or impede the development of dynamic capabilities within firms. Findings show that institutional support inhibits the development of coopetition capability in SMEs in Zambia, a developing economy, contrary to previous studies in emerging economies where institutional support promotes the development of collaborative capabilities (Mariani, 2007; Cai et al., 2010). Indisputably, the study reduces the scarcity of empirical research by incorporating other non-traditional theories and factors likely to account for the development of dynamic capabilities for organisational outcome. A clear implication for researchers is the need to contextualise the development of dynamic capabilities in terms of for example firm size and institutional environment as revealed in this study.

With the exceptions of Schilke (2014a; 2014b), the vast majority of studies have not only relied on a limited set of antecedents to interfirm relationship management capabilities, completely ignoring the role of institutions in interfirm relationship management capability, but have also fallen short of clearly expounding the boundary conditions of dynamic capabilities' performance outcomes. Currently, there exists a lacuna in the dynamic capabilities literature on the contingent value of dynamic capabilities especially as regards management of interfirm relationships (Schilke, 2014a; Barreto, 2010). By examining not only the drivers of coopetition capability but also the contingent effect of coopetition learning process and institutional support on the coopetition capability-coopetition performance relationship, this study extends theory and is a timely heed to Barreto (2010), Schilke's (2014a) and Eriksson (2014) calls for dynamic capability researchers to also consider the environmental and firm specific factors when making claims about the performance outcomes of dynamic capabilities.

Results of this study show that both variables negatively moderate the coopetition capability-coopetition performance relationship. This implies that coopetition capability should not be regarded as a universal one-fits-all solution for performance but might depend on certain conditions. For example, the significant negative interaction effect between coopetition learning process and coopetition capability on coopetition performance suggests that not all resources and capabilities enhance performance when combined nor is 'many always the best', challenging the resource complementarity view. In fact combining certain resources or capabilities could damage performance as revealed in this study. Furthermore, although marginally, high levels of institutional support deteriorate the positive coopetition performance effects of coopetition capability. This raises the need for researchers to consider the institutional environment when making performance claims of dynamic capabilities.

Empirically, the fact that the study's conceptual model is tested on SMEs in a developing economy is another contribution. Traditionally, studies on coopetition have focused on large firms to the neglect of coopetition in SMEs (Gnyawali and Park, 2009). Yet, coopetition strategy could be of greater importance in SMEs not only because of the firm specific challenges these firms face but also because these ventures are more vulnerable to environmental forces compared to their large-sized counterparts (Mesquita and Lazzarini, 2008; Morris et al., 2007). As such, this study makes a contextual contribution by examining the coopetition phenomenon in SMEs.

Furthermore, this empirical research is valuable considering the knowledge gap that exists between strategic behaviours and practices of firms in developed and developing economies (George et al., 2016). This, along with the fact that firms in developing economies such as Africa, operate in a different institutional context and face unique

institutional challenges (such as under-developed legal structures, communication infrastructure and market intermediaries as well as widespread collectivist social setting (George et al., 2016; Wright et al., 2005; Xu and Meyer, 2013)), ensures the study's developing economy setting enriches existing interfirm relationship scholarship while also bringing out rare evidence on the applicability of new constructs, such as coopetition, established and validated in Western economies. Although the study uses measures developed in the West, the findings are consistent with those found in the West and thus confirms that the measures transcend context be it firm size or geographical location. For instance, the study's finding of a positive relationship between coopetition capability and coopetition performance in SMEs lends support to Schilke and Goerzen's (2010) study on large companies in Germany of a positive relationship between alliance management capability and alliance success.

Overall, the study shows that the institutional theory and the RBV provide sound theoretical platforms for explaining the antecedents, outcomes and contingencies of dynamic capabilities in SMEs in a developing economy. The conceptual model consisting of the drivers (managerial ties, coopetition learning process and institutional support), boundary conditions (coopetition learning process and institutional support) and performance outcomes (coopetition performance which leads to firm performance) of coopetition capability developed and tested in a developing economy is the first of its kind and thus represents a unique contribution to knowledge. In sum, this study extends coopetition research by including and changing insights from the broad alliance research, particularly alliance management capability (Schilke and Goerzen, 2010; Schilke, 2014a; 2014b; Kale and Singh, 2007; Sluyts et al., 2011).

8.4 Managerial implications

In today's dynamic, complex, and global business world, coopetition appears to be a viable strategy for enhancing firm performance, particularly for SMEs who are often faced with tight resources and capabilities which threaten their growth and performance goals. Coopetition allows firms to have access to critical competitors' resources and capabilities which lead to improved economic performance. However, in view of the fact that coopetition can be both value enhancing and value damaging, this study provides insights into the importance of firms investing in routines and mechanisms for managing coopetitive relationships coined in this study as coopetition capability. Given the complexities and uncertainties that characterize cooperative relationships between competitors, coopetition capability allows SMEs to develop and effectively manage coopetitive relationships with the right partners to create greater market value. The study demonstrates that this coopetition management competence comprises interfirm coopetition coordination, coopetition portfolio coordination, coopetition learning, coopetition proactiveness, and coopetition transformation. Managers are therefore advised to invest in these five organizational routines for them to effectively manage their coopetition arrangements towards successful outcomes. More specifically, coopetition capability is likely to enhance SMEs' performance because SMEs involved in coopetition arrangements are able to reap a variety of benefits such as cost and risk sharing, access to a variety of coopeting partner's skills, knowledge, resources and capabilities in various value chain activities.

This study also informs SME managers of how they can enhance the development of coopetition capability. Specifically, the study finds that while managerial ties and coopetition learning process both positively influence coopetition capability, institutional support inhibits coopetition capability. Managers are therefore advised not

to rely more on institutional support to enhance their capability to manage coopetitive relationships. Instead, they are encouraged to engage in more social relations with managers of other companies for them to increase their experience and know-how in dealing with interfirm relationships including relationships with competitors. In addition, managers are informed to invest in ways for increasing coopetition learning process, focusing on activities that inspire articulation, codification, sharing and internalising of coopetition know-how within their firms if they are to enhance the development of coopetition capability. The four aspects of coopetition learning process should increase both managers' and organizational members' coopetition management knowledge, and thus develop an increased coopetition capability that will allow them to succeed in coopetitive relationships to eventually improve firm performance. Deliberate efforts of learning such as collective discussions or performance evaluation of coopetitive relationships and coopetition knowledge sharing within the firm can be used to enhance coopetition capability. If firms share less of their coopetitive experiences with other members of the organisation, it is likely that coopetition knowledge will only reside in those, a few, who are already vested with coopetition knowledge. This can be dangerous for firms especially in situations where there is employee turnover. The fact that post hoc analysis indicates that not all learning mechanisms have a significant positive effect on coopetition capability implies that firms should not just invest in all the learning mechanisms but carefully consider the mechanisms appropriate for building coopetition capability. Evidence in this study indicates that articulation and sharing are the most important.

While the existing literature remains silent about the kind of external environmental forces and firm specific activities that may condition the extent to which organizations benefit from coopetition capability, evidence in this study suggests that the benefits

organizations obtain from developing competence in managing coopetition arrangements is contingent upon differential levels of coopetition learning process and institutional support. The fact that developing dynamic capabilities involves costs and as such, to invest in a dynamic capability when there is no need for change could merely be carrying a cost burden and a mistake (Schilke, 2014a; Winter, 2003), this study provides managers with useful insights on the potential value of investing in coopetition capability in differential levels of coopetition learning process and institutional support. The finding that coopetition learning process reduces the positive effects of coopetition capability on coopetition performance highlights the need for managers to identify effective ways of combining their resources and capabilities, coopetition learning process and coopetition capability in this case, to fully benefit from such combinations. More specifically, coopetition capability is more beneficial for coopetition performance with low levels of coopetition learning process. While high levels of coopetition learning process are necessary for the development of coopetition capability, managers need to identify adequate levels of the learning process that will enhance the coopetition capability and coopetition performance relationship. Apparently, this relationship is less effective in levels of high coopetition learning process. This implies that investing more in coopetition capability when learning processes are high is less useful for coopetition performance. Thus, managers should be cautious not to over emphasise coopetition learning process routines to the point of encouraging bureaucracy and slow decision making. Also, firms should be very careful not to simultaneously invest more in both processes and routines but should identify adequate levels at which the joint effect of these mechanisms are optimal for coopetition performance.

The negative interaction between institutional support and coopetition capability implies that firms in environments with high institutional support should be cautious of how they spend and commit resources to manage coopetitive relationships. Investing more in coopetition capability when institutional support is high damages coopetition performance and subsequent financial performance. However, managers whose firms are in environments with low institutional support should invest more in coopetition capability to succeed in coopetitive relationships and enhance firm performance.

8.5 Policy implications

As there is a pressing need to improve the competitiveness of SMEs, in view of the increasing global competition, the study informs SME public policy makers, especially from developing economies like Zambia, that one way to achieve competitiveness is for SMEs to cooperate with their competitors. The study provides evidence that SMEs would draw extensively on coopetition to overcome their resource shortages and increase their viability in this complex world. Through coopetition, SMES will be able not only to pool resources together but also minimise costs and improve their performance. In fact, coopetition provides an avenue for government to lessen its burden of providing support to SMEs. However, considering the challenges and risks that characterise coopetitive relationships, there is need for policy makers to help enhance the performance of such relationships.

The study reveals that coopetition capability is one way of enhancing the performance of coopetitive relationships and subsequent firm performance. Therefore, policy makers need to identify and implement appropriate policies aimed at enhancing the development of this capability in SMEs. More specifically, the evidence of the negative influence of institutional support both as a driver of coopetition capability and as a

moderator of the coopetition capability-coopetition performance relationship revealed in this study raises serious implications for policy. As suggested, institutional support not only inhibits the development of coopetition capability but also weakens its performance outcomes as it acts as a substitute mechanism for coopetition. In light of this, government agencies are advised to evaluate their support programs and identify other effective support mechanisms that do not impede coopetitive relationships. One way is to introduce coopetition capability development support programs that are more focused on enhancing interfirm relationship management skills and competences. This can range from conducting training programmes on how SME firms can work together and coordinate their coopetitive relationships to providing platforms that allow SMEs to network and facilitate the transmission of knowledge necessary for coopetition. SMEs should also be encouraged to be more innovative in finding strategies to enhance coopetition performance in total autonomy.

8.6 Limitations and future research

Although this study investigates coopetition at the portfolio as recommended by Sarkar et al. (2009), it would be more interesting to investigate the performance of coopetition at the dyadic level. This is because firms have multiple coopetitive relationships at different phase of the lifecycle and aimed at achieving different goals and with variations in their performance. Therefore investigating the performance of the relationships at the dyad may bring out issues that might not be captured by simply investigating a firm's coopetition portfolio.

This study has attended to the effect of the regulatory pillar of institutions but has not examined the cognitive and normative aspects. This was conceptualised in terms of the generalised perceptions of institutional support available to firms in their industries.

The advantage of this approach is that it helps understanding of the overall picture of a specific institutional order. However, the study does not disclose how the three pillars may have differential impact on the development of coopetition capability nor on its performance outcomes. Future studies may examine the differential impacts of the three pillars. This might be of particular interest considering the fact that firm behaviour and action may be induced not only by instrumentally oriented perceptions of incentives and constraints through institutional support but also by cultural norms through cognitive and normative aspects. There is also a potential for examining how the three pillars may complement or undermine the effect of one another on the development of coopetition capability and its performance outcomes. This might be of particular interest for policy makers seeking insights on the differential impact of the pillars to effectively manipulate them in ways that enhance performance.

While the study provides insights on the value of dynamic capabilities under varying levels of internal and external environmental forces and finds that both institutional support and coopetition learning process weaken the performance outcomes of coopetition capability, there is need for deeper qualitative investigations to offer better theoretical understanding into the mechanisms responsible for these findings.

The data in this study is cross sectional in nature and was collected at one point in time, as such, no inferences of causality can be made. Also, because strategic moves and organisational structures are dynamic and can change over time, they are better understood if tracked over time (Lorenzoni and Lipparini, 1999). As such, longitudinal studies could help to further assess causality of the hypothesised relationships. Another related issue is that of common method variance due to the fact that data on both the dependent and the independent variables was collected from single informants. While

the study has taken a number of steps to reduce the concern of CMV, more elaborate research designs (such as longitudinal designs) and collection of data from multiple responses could further moderate such concerns.

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APPENDICES

Appendix 2A: Summary of key studies on alliance management capability

Authors	AMC definition	Study aim	Theoretical lens used/context	Antecedent variables studied	Outcome variables studied	Moderator variables studied	Key findings
Sarkar et al. (2001)	Alliance proactiveness: The extent to which an organisation engages in identifying and responding to partnering opportunities.	To investigate the effects of alliance proactiveness on market-based firm performance.	Contingency framework 182 US firms	Alliance proactiveness	Market-based firm performance	Size and environ mental uncertainty	Alliance proactiveness leads to superior market-based performance and that this effect is stronger for small firms and in unstable environments.
Kale et al. (2001)	---------	To demonstrate how companies which invest in alliance structures to co-ordinate alliance activity and systems reap benefits.	200 US organisations	Alliance experience, alliance structure and alliance management systems	Alliance success and value creation	----	Investment in an alliance structure provides benefits to companies.eg higher and positive abnormal stock gains following alliance formation, to higher long term alliance success and to improvements in companies' alliance management practices over time. Alternate ways of assessing alliance success are positively related to each other i.e. abnormal stock gains and managerial assessment. Alliance function creation is challenging: needs human and financial resources.

Kale et al. (2002)	How effectively a firm is able to capture, share, and disseminate the alliance management know-how associated with prior experience	To examine the development of firm level alliance capability and to assess whether or not this capability is correlated with superior alliance.	Dynamic capabilities approach, organisational learning, resource based view, evolutionary economics. 292 US companies.	Alliance experience, alliance function	Alliance success: stock market and managerial assessments	----	Firms with greater alliance experience and those that create a dedicated alliance function realize greater success with alliances. Alliance function more significant. Positive correlation between stock-market based measures of alliance success and alliance success measured through managerial assessments
Draulans et al. (2003)	AC or A skill: mechanisms and routines that are purposefully designed to accumulate, store, integrate, and diffuse relevant organisational knowledge about alliance management.	To investigate alliance capability development.	Dynamic capabilities approach, resource based view, evolutionary economics 46 Dutch companies	Alliance training, alliance specialist and alliance evaluation mechanisms	Alliance performance	----	Paying attention to alliance management by investing in alliance training, alliance specialists and alliance evaluation raises alliance success rate.
Kale & Singh (2007)	----	To develop the notion of alliance learning process.	Dynamic capability, knowledge based view. 175 US.	Alliance learning: articulation, codification, sharing and internalisation of alliance management know-how. Alliance function Alliance experience	Alliance success	----	Alliance learning that involves articulation, codification, sharing, and internalisation of alliance management know-how is positively related to a firm's overall alliance success (alliance capability). Alliance function is positively related to a firm's learning process, and that process partly mediates the relationship between the alliance function and alliance success. Implying, alliance learning process acts as one of the main mechanisms

							through which the alliance function leads to greater alliance success.
Heimeriks & Duysters (2007)	Alliance capability: a higher-order resource which is difficult to obtain or imitate and has the potential to enhance the performance of the firm's alliance portfolio	To examine how firms can enhance alliance performance through the development of alliance capabilities.	Dynamic capability, knowledge based view. US and Europe.	Alliance experience Alliance capabilities	Alliance performance	----	Alliance capabilities partially mediate the relationship between alliance experience and alliance performance.
Kale & Singh (2009)	----	To discuss how firms can address alliance failures by identifying some of the primary drivers of alliance success.	----	Alliance experience, creation of alliance function, firm level processes to learn and accumulate alliance know-how.	Alliance management capability	----	Firms need to learn how to manage certain new types of alliances, generate incremental value by taking a portfolio approach to managing their alliances, and realize gains by extending their alliance capabilities to become relational organizations that are adept at successfully managing other interfirm relationships.
Schreiner et al. (2009)	AMC- capability to handle or manage any individual alliance APC- capability to manage an entire portfolio of alliances	To understand the dimensions or skills that comprise a firm's capability to manage any individual alliance. US Software service providers.	Dynamic capability. German and Switzerland.	AMC comprises: Coordination, communication, and bonding	Alliance success	----	AMC as a multidimensional construct that comprises three distinct but related aspects or skills : coordination, communication, and bonding AMC impacts certain alliance outcomes

Schilke & Goerzen (2010)	A type of dynamic capability with the capacity to purposefully create, extend, or modify the firm's resource base, augmented to include the resources of its alliance partners	To conceptualise and measure the concept of alliance management capability. 204 Germany firms	Dynamic capability. Germany	Alliance structure, alliance experience	Alliance portfolio performance	----	Alliance management capability has a positive impact on alliance portfolio performance and mediates the performance effects of dedicated alliance structures and alliance experience.
Sluyts et al. (2011).	AMC: a firm's ability to capture, share, disseminate and apply alliance management knowledge	To verify the impact of AMC on alliance performance and to analyse the drivers of AMC. 189 Belgian companies.	Resource based view, dynamic capability. Belgium.	Alliance learning processes: articulation, codification, Internalisation & sharing **Drivers of AMC:** organisational culture, commitment of top team, alliance experience and alliance function	Alliance performance	----	Commitment of top management team is the most critical factor in explaining success with alliances.
Schilke (2014a).	Organisations with a strong alliance management capability possess routines that support various alliance-related tasks, such as partner identification and Interorganisational learning, that facilitate an effective execution of interfirm relationships	To empirically investigate the link between dynamic capabilities and competitive advantage and to examine the efficacy of dynamic capabilities under conditions of varying environmental dynamism.	Dynamic capability, contingency theory. Germany	Alliance management capability and new product development capability.	Competitive advantage	Environmental dynamism	Alliance management capability and new product development capability are more strongly associated with competitive advantage in moderately dynamic than in stable or highly dynamic environments.

Leischnig et al. (2014).	A firm's capacity to purposefully create, extend, or modify the firm's resource base, augmented to include the resources of its alliance partners.	To develop and empirically test a research framework that incorporates key factors of technology transfer success. 68 cross industry Germany firms.	Relational view. Germany	Alliance management capability, organisational compatibility, and interaction quality.	Interorganisational technology transfer.	Alliance management capability.	Alliance management capability and organisational compatibility are key drivers of interaction quality, which in turn increases technology transfer success.
Kauppila (2015).	----	To investigate the process by which firms can realise potential value of their alliance management capability. 172 Finnish manufacturing firms	Resource based view. Finland.	Alliance management capability	Co-exploration Co-exploitation Firm growth Financial performance	Co-exploration Co-exploitation	Alliance management has an inverted U-shaped effect on co-exploration, but an increasingly positive effect on co-exploitation. Co-exploration drives firm growth in the longer run, co-exploitation has a positive effect on short-term financial performance. Ambidextrous pursuit of simultaneous co-exploration and co-exploitation is negatively related to firm performance.
Schilke (2014b)	----	To make a distinction between first-order dynamic capabilities and second-order dynamic capabilities	Dynamic capability. Germany.	Second-order dynamic capabilities: alliance learning	First-order dynamic capabilities: alliance management, alliance portfolio	learning	First-order dynamic capabilities mediate the performance effects of second order dynamic capabilities. Negative interaction between first order and second-order dynamic capabilities.
Duysters et al. (2012)	----	To examine whether firms learn to manage alliance portfolio diversity	Organisational learning. Us and Europe	Alliance portfolio diversity	Alliance portfolio performance	Alliance experience. Alliance learning capabilities	A curvilinear relationship between diversity and performance. Alliance experience positively influences the diversity-performance link; alliance capabilities positively moderate the diversity-performance relationship but only at high levels.

Sarkar et al. (2009)	----	To conceptualise alliance portfolio management capability and examine its impact on organisational outcomes.	Network and social capital. US.	Alliance capability: alliance proactiveness, relational orientation and portfolio coordination	Alliance portfolio capital, firm performance	Alliance function and diversity of the portfolio	Alliance capability enhances alliance portfolio capital. Alliance portfolio capital has a positive impact on firm performance. Alliance function positively moderates proactiveness and relational orientation but negatively moderates portfolio coordination
Castaldi et al. (2015)	Alliance management capability: coordination, communication, bonding	To investigate alliance management development	----	Alliance experience	Alliance management capability	Governance mechanism	Theoretical framework.
Castro and Roldan. (2015)	adeptness in identifying partners, initiating strategic alliances, taking part in continuous management and the possible restructuring and even completion of these alliances	To investigate the relationships among the different dimensions of the alliance portfolio management capabilities.	Resource based view. Spain.	Partnering proactiveness, Relational governance, portfolio coordination.	Alliance portfolio performance.	----	The dimensions of alliance portfolio management capability are related in such a way that the relational governance and the portfolio coordination: (1) partially mediate the effect of partnering proactiveness on the alliance portfolio value; and (2) exert significant influences on the alliance portfolio performance.

Appendix 4Ai: Qualitative interview guide

1. COMPANY BACKGROUND

Company Name……..
Contact details……
Firm size, Industry…….
Interviewee's Position……
Date and Time of Interview……

2. Coopetition

a. Do you cooperate with your competitors?
b. What's your overall description of cooperation with competitors
c. Why do you cooperate with your competitors? (Motivation). What factors led your firm to establish cooperative relationships with your competitors?
d. Is cooperation with competitors common in your industry, sector?

- Why?

3. Coopetition intensity

a. How many alliances have you formed over the last five years?
b. How many of these alliances have you formed with your competitors (firms operating in the same business area)?
c. How many of these are formalised e.g., with signed contract/agreement
d. How many are not formalised? No contract
e. To what extent do you cooperate with your competitors
f. In what activities do you cooperate with your competitors?
g. What determines the extent to which a firm cooperates with your competitors?

4. Coopetition quality

a. How would you describe high quality cooperative relationships with competitors? (What determines high quality coopetitive relationships?
b. Do you experience disagreements on certain key issues with your competitors? Give examples
c. How do you handle conflicts with your competitors?
d. Generally how would you judge a high quality coopetitive relationship?

5. Institutional

a. How is cooperation with competitors (coopetition viewed in your industry?
b. What role, if any, does the government, trade associations play in as far as cooperation with your competitors is concerned?
c. Are there any rules, policies governing and regulating coopetition in your industry?
d. Are there any incentives or policies that encourage cooperation with competitors? E.g. workshops or seminars, subsidies
e. In case of breach of contract by a partner, what options are there for the compliant partner?

6. Task Environment

a. How would you describe your industry in terms of

- Competitive intensity
- technological change

- change in customer preferences and values
- predictability of change
- availability of resources such as labour, finance, suppliers

b. What role does any change in these (items in a) play in as far as cooperation with your competitors is concerned (in terms of intensity and quality)? (Explain)

7. Coopetition capability

a. How would you describe a firm with the ability to cooperate with competitors?

b. Does your firm have the capability to handle cooperation with your competitors? Explain

c. Who coordinates the cooperative activities with your competitors

d. Does your firm have a function, department or person responsible for cooperation with competitors?

e. How long has your firm been involved in cooperation with competitors?

f. What role does coopetition capability play in cooperative relationships with competitors in terms of intensity and quality?

8. Performance outcomes.

a. What are the outcomes of cooperation with competitors?

b. What benefits/costs has your firm incurred because of cooperation with competitors?

c. Would you say the number of cooperative relationships with competitors has an impact on a firm's :

- financial position in terms of
- market position,
- customer

(explain)

d. Would you say the quality of cooperative relationships with competitors has an impact on a firm's :

- financial position in terms of
- market position,
- customer

(explain)

9. Generally

a. What are the benefits of cooperation with competitors?

b. What are the risks associated with cooperation with competitors?

c. What would you say are the key success factors when it comes to cooperation with competitors?

d. What challenges do you face in cooperating with competitors?

e. What are the causes of failure in coopetition?

10. Any other comments

Appendix 4Aii Details of companies interviewed

No.	Firm	Areas of cooperation	Number of employees	Years in Business
1.	Television Company (TC)	Signal cost sharing; Equipment and/or technical support; Employee training	189	12
2.	Civil and Building Contracting Company (CBCC)	Subcontracting; credit facilities; equipment and technical know-how; facilitation of some works due to connections	42	7
3.	Telecom Company (TEC)	Tender submission, Subcontracting, technical support alliances, information sharing	39	10
4.	Construction Company (CC)	Subcontracting	35	6
5.	Higher Education Institution (HEI)	Education products, selection of students, information, advertising, materials and facilities	63	22
6.	Medical Centre (MC1)	Referral points; equipment; information sharing second opinion	22	11
7.	Air Travel Company (ATC)	Ticketing	16	4
8.	Mining and Construction (M&C)	Supply of raw materials; negotiations with the government organisation of trade and mining shows	110	15
9.	Surgery (SU)	Referrals; equipment; second opinion	17	13
10.	Tour Operator (TO)	Ticketing	13	3
11.	Mining Company 1 (MC1)	Credit facility, employee training, information exchange	19	6
12.	Research & Development (R&D)	Products materials and equipment human resource	27	8
13.	Mining company (MC2)	Supply of products, pricing discounts, training of employees, advertising, organising of trade shows	89	23
14.	Electrical Equipment Manufacturing Company (EEMC)	Subcontracting	46	9
15.	Radio Station (RS)	Technical support, equipment organising live shows, organising end of year parties	28	5

Appendix 4Aiii: Word list for content analysis on the study constructs

Constructs	Content analysis words and codes to represent the companies
Coopetition interfirm coordination	- We do not have a department so to say. However, our **Contracts Manager is in charge** of identifying and entering into agreements with other companies. This person is also in charge of **managing the relationships, and informs all of us on any new relationship or any changes in the agreements**. This is done through meetings and/or memos. The key thing is that the Contracts Manager **evaluates the contracts** before agreeing to enter into an agreement with potential partners. **CC.** - We make sure we **monitor** performance of the cooperation during the course of the contracts. We have weekly and monthly performance reviews to check on the progress of the agreements. **TEC.**
Coopetition portfolio coordination	- Our company has learnt to take time to do a **background check on all competitors** we cooperate with before any partnerships are formed. So that we **do not end up in relationships that should not have been there from the get** go. **ATC.** - We have monthly **meetings** with our partners. This helps us in ironing out some critical issues. This helps to **narrow the gap and link up as information** is shared during the meetings. **HEI.**
Coopetition learning	- Also, through cooperation **HEI** has been able to **learn** from competitors and has grown in terms of student number. The learning has mainly been **through sharing notes with competitors** in meetings. We have Board of Studies meetings where our cooperating partners explain how they run their programs and **we benefit from that information**. **HEI.** - **MC** has the ability to cooperate with competitors because the company is very open to competitors to come and **learn** from us and vice versa, which is the reason these relationships have been successful over the last eight years. **MC.** - Cooperating with competitors is a strategy in the right direction because apart from lack of capacity to do it alone, we also get to **learn** a lot from each other while at the same time offering better solutions and understanding the market better. **RS.** - This is very beneficial because there is always something new to **learn** from a competitor, especially one who has been in business longer. The partnerships have been mutually beneficial. An example is where EEMC director **learnt** and **picked key information** from a competitor's director who has been in business for fifteen years; and in four years we are now bigger than a fifteen year old business, after **implementing the strategies learnt**. **EEMC.** - We learn from them (cooperating competitors), **exchange knowledge** to expand business for example human resource. **CC.**
Coopetition proactiveness	- Our company has been **proactive** in doing background checks on all competitors before any partnerships are formed. **APM.** - We cooperate with our competitors because of the resource constraints that we face. We have no choice but **to approach and enter** into agreements with our competitors who have the resources. **MC1.**
Coopetition transformation	- The agreements are revised and there is always **room for flexibility and change**. The accountant is in charge of managing the relationships. Communication is done within the firm to allow other colleagues know of the agreements. In short there is information sharing at the inception of the contract especially with those concerned. **SU.** - Key success factors for partnerships include **flexibility, information sharing**, and holding of meetings to **review** the relationship. We are flexible in that we can **easily change the agreements** to our advantage. **HEI.**
Coopetition capability and relationship performance	- What it is, is that, the Contracts Manager will evaluate the contracts before agreeing to enter into the agreement with the would-be partners. Lawyers are also consulted to advice on the legal implications before we could commit ourselves. This is to ensure that the relationship we have with our partners is successful. **CC.** - We make sure we **monitor performance of the cooperation** during the course of the contract. We have weekly and monthly performance review meetings to check on the progress of the agreement'. **EEMC.**

	- **CBCC** has the ability to cooperate with competitors because the company is very open to competitors to come and learn from them and vice versa, which is the reason these **relationships have been successful** over the last eight years. **CBCC.**
Processes of learning to cooperate with competitors	- We have meetings with our partners. This helps to narrow the gap and link up. **Information is shared** with other members of staff during the Board of Studies. The Coordinator reports to the Head of Department and information is shared internally to everyone during meetings. **HEI** - **Information is shared** during the alliance meetings. These meetings are tight and usually last for five full days. In short there is **information sharing** at the inception of the contract especially with those concerned. We are guided and directed by a **formal** contract. The monthly meetings help us in ironing out some critical issues. **TEC** - Mainly as the Business Development Manager, I inform the other managers on the relationships. This is done during meetings. **CBCC** - Communication is done within the firm to allow other members know of the agreements. In short there is information sharing at the inception of the contract especially with those concerned. **SU**
Institutional support	- We cooperate with foreign firms because of **government requirement for local content**. The government requires that contracts are awarded to companies with more local or Zambian shareholders. **EEMC, MC2, TEC.** - As a department, we are affiliated to a number of competing institutions. It is a **requirement** in Zambia that our institution is affiliated with a more experienced institution. **HEI** - As a private clinic, we usually consult other clinics on certain issues to get second opinion. This (second opinion) is a **requirement by law** for quality assurance. Therefore, we work with our competitors. **MC1.** - Cooperation with competitors is the way of the future for this industry, especially in the road sector where companies are being **forced by law** to work together. **CC.**
Conditioning role of learning processes	- At **TEC**, we also have our own meetings where we analyze the alliance and see how we are benefiting as a company. The company representatives update us in our meetings. And he informs all of us on any new relationship or any changes in the agreements. This is done through meetings and/or memos. **TEC** - Through cooperation HEI has been able **to learn** from competitors and this has helped us grow in terms of student number. **HEI.**
Conditioning role of institutional support	- The government's requirement for local content in this industry is a good boost as we tend to have a lot of foreign companies wanting to partner with us. So these foreign companies are forced to join muscles with local companies and that is how we found ourselves working with foreign competitors'. **TEC.**

Appendix 4Bi: List Of Items Used To Measure Study Constructs:

Construct	Construct item items	Source
Coopetition capability	**Coopetition interfirm coordination** Cooperative activities with our competing partners are well coordinated. We ensure that joint work tasks with our competing partners fit very well. We ensure that joint work with our competing partners is harmonised. We systematically coordinate our strategies across different partnerships with competitors. There is a great deal of communication with our competing partners on most decisions. **Coopetition portfolio coordination** There is coordination among the cooperative activities of our different competing partners. We determine areas of synergy with our competing partners. We ensure that interdependencies between our competing partners are identified. We determine if there are overlaps between our different competing partners. **Coopetition learning** We have the capability to learn from our competing partners. We have the managerial competence to absorb new knowledge from our competing partners. We have adequate routines to analyse the information obtained from our competing partners. We conduct periodic reviews of our partnerships with competitors. We modify relationships with our competing partners as we learn from experience. We integrate our existing knowledge with new information acquired from competing partners. **Coopetition proactiveness** We pre-empt our competition by entering into partnership opportunities with our competitors. We often take the initiative in approaching competitors with partnership proposals. We are proactive in finding and going after partnerships with competitors. We monitor our environment to identify partnership-with-competitors opportunities. We gather information about prospective competing partners from various forums (e.g., trade shows, publications, internet etc.). We are alert to market developments that create potential partnership-with-competitors opportunities. **Coopetition transformation** We are willing to put aside contractual terms to improve the outcome of our partnerships with competitors. When an unexpected situation arises, we would rather modify a partnership agreement with our competitors than insist on the original terms. We are willing to change our partnership with competitors in case of any change in the business environment. Flexibility, in response to a request for change, is characteristic of our partnership-with-competitors' management process.	Schilke &and Goerzen (2010)

Coopetition performance	Our partnerships with competitors are characterized by strong and harmonious relationships. Our company has achieved its primary objective in forming the partnerships with competitors. Our company's competitive position has been greatly enhanced due to partnerships with competitors. Our company has been successful in learning some critical skills or capabilities from its competing partners.	Kale and Singh (2007)
Managerial ties	I can obtain information about my industry faster than competitors. I can obtain resources needed for business success faster than competitors. I have a professional relationship with someone influential in my industry. I have engaged with someone influential in my industry in informal social activity (e.g. playing and supporting football).	Shane and Cable (2002); Luo (2003); Boso et al. (2013)
Coopetition learning process	**Coopetition knowledge articulation** The manager involved with partnerships with competitors is regularly debriefed about their prior and/or current partnership experience. The manager responsible for partnerships with competitors maintains a report of all major partnership decisions. The manager regularly reports on the performance of the partnerships with competitors. We maintain a database containing factual information of each of our partnerships with competitors (e.g., date and purpose of formation). We maintain a contact list of individuals from within who can provide assistance on partnerships with competitors. We maintain a contact list of individuals from outside who can provide assistance on partnerships with competitors. **Coopetition knowledge codification** The manager follows a well-defined process to guide the formation or management of any partnership with competitors. Guidelines are developed and used to assist managerial decision making while forming or managing partnerships with competitors. Manuals (containing tools) are developed and used to assist managerial decision making while forming or managing partnerships with competitors. We update the guidelines or manuals related to partnerships with competitors **Coopetition knowledge sharing** Management conducts a collective review to assess the progress and performance of its partnerships with competitors. Management participates in forums such as committees to take stock of their management experience related to partnerships with competitors. Management participates in forums such as meetings, to exchange information and experiences related to partnerships with competitors. Management engages in informal sharing and exchange of information related to partnerships with competitors with colleagues. Managers with prior experience in managing partnerships with competitors are usually rotated across some of the company's partnerships. Managerial incentives are used to encourage individual managers to share their management experience related to partnerships with competitors. **Coopetition knowledge internalisation** Managers attend in-house training programs on managing partnerships with competitors. Managers attend externally conducted training programs on managing partnerships with competitors.	Kale and Singh (2007)

	We provide opportunities for on-the-job training to individuals who are relatively new to managing partnerships with competitors. We provide managers access to information on prior and ongoing partnerships with competitors.	
Institutional support	The government and its agencies provide needed technical support for companies. The government and its agencies play a significant role in providing financial support for companies. The government and its agencies help companies to obtain raw materials and equipment needed for their operations. The government sets aside government contracts for new and small businesses. The government and its agencies have special support available for individuals who want to start a new business. The government and its agencies assist individuals with starting their own businesses.	Li and Atuahene-Gima (2001)
Firm Size	How many employees does your company have?	Schreiner et al, (2009).
Firm age	How many years have you been in this business?	Boso et al, (2013)
Firm coopetition experience	Please indicate the number of alliances your company has had within the last 5 years How many years has your company been cooperating with competitors	Kale and Singh (2007); Schilke &and Goerzen (2010)
Cooperation with other market players	We spend considerable effort on collaborating with customers. We maintain good relationships with customers. We spend considerable effort on collaborating with suppliers. We maintain good relationships with suppliers. We spend considerable effort on collaborating with distributors. We maintain good relationships with distributors.	Li and Zhang (2007).
Coopetition structure	There is a great deal of support for the management of partnerships with competitors. There are units primarily dedicated to the management of partnerships with competitors. We have a porous organizational boundary that facilitates better communication with our competing partners. Our organizational structure can be characterized as a flexible value-adding network. There is an employee(s) primarily dedicated to the management of partnerships with competitors	Kale and Singh (2007); Schilke &and Goerzen (2010)

Appendix 4Bii: Questionnaire

COMMONWEALTH SCHOLARSHIPS

UNIVERSITY OF LEEDS

COOPETITION CAPABILITY SURVEY

Dear Respondent,

Thank you for agreeing to participate in this study of the drivers and performance outcomes of coopetition capability. We define coopetition capability as a company's ability to cooperate with its competitors in its industry. With the increasing dynamism and complexity of today's business world, we believe that it is imperative to understand what drives companies like yours to develop an ability to cooperate with their competitors, and what the success outcomes of such an ability are.

This project is funded by the Commonwealth Scholarship Commission in conjunction with the University of Leeds, United Kingdom, and is guided by protocols for confidentiality. As such, please be assured that your responses will be treated in strictest confidence, with the results collected being anonymised and used for statistical purposes only. Please answer every question, reflecting on your attitudes and opinions about your company's cooperation with its competitors. Although some questions appear very similar, please answer them anyway as this is deliberately done for statistical analysis purposes.

Once again, we are extremely grateful that you should take the time to participate in this study.

Yours sincerely,

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Please indicate your consent for participation here: *I agree* ☐ *I disagree* ☐

SECTION A

Please indicate, by circling one number, the extent to which you agree with the following statements about the business environment in which your company operates. *(1 =strongly disagree, 2= disagree, 3= slightly disagree, 4= neither agree nor disagree, 5= slightly agree, 6= agree, 7= strongly agree).*

In our industry…	*Strongly Disagree*			*Neither agree nor disagree*			*Strongly Agree*
The government and its agencies provide needed technical support for companies.	1	2	3	4	5	6	7
The government and its agencies play a significant role in providing financial support for companies.	1	2	3	4	5	6	7
The government and its agencies help companies to obtain raw materials and equipment needed for their operations.	1	2	3	4	5	6	7
The government sets aside government contracts for new and small businesses.	1	2	3	4	5	6	7
The government and its agencies have special support available for individuals who want to start a new business.	1	2	3	4	5	6	7
The government and its agencies assist individuals with starting their own businesses.	1	2	3	4	5	6	7
There are lots of new competitors.	1	2	3	4	5	6	7
Market activities of our key competitors have become more predictable.	1	2	3	4	5	6	7
Competitors are constantly trying new competitive strategies.	1	2	3	4	5	6	7
The tastes and preferences of our customers have become more stable and predictable.	1	2	3	4	5	6	7
Customer needs and demands are changing rapidly.	1	2	3	4	5	6	7
Rate of innovation of new operating processes and new products or services has fallen dramatically.	1	2	3	4	5	6	7
Companies are rapidly innovating.	1	2	3	4	5	6	7
The failure rate of companies is high.	1	2	3	4	5	6	7
One bad decision could easily threaten the success of my company.	1	2	3	4	5	6	7
Competition is high.	1	2	3	4	5	6	7
Customer loyalty is low.	1	2	3	4	5	6	7
There are severe price wars.	1	2	3	4	5	6	7
There are low profit margins.	1	2	3	4	5	6	7
There are plenty opportunities for growth.	1	2	3	4	5	6	7
The business environment will support continued growth of our company.	1	2	3	4	5	6	7
Prospects for business growth in our current business environment are good.	1	2	3	4	5	6	7
Our business environment is rich with opportunities for business growth.	1	2	3	4	5	6	7

SECTION B

Please indicate, by circling one number, the extent to which the following statements represent the actual situation about your company's relationship with other market players. *(1= not at all, 2= to a very slight extent, 3= to a small extent, 4=to a moderate extent, 5= to a considerable extent, 6 = to a great extent, 7=to an extreme extent).*

In our Company, …	*Not at all*			*To a moderate extent*			*To an extreme extent*
We spend considerable effort on collaborating with customers.	1	2	3	4	5	6	7
We maintain good relationships with customers.	1	2	3	4	5	6	7
We spend considerable effort on collaborating with suppliers.	1	2	3	4	5	6	7

We maintain good relationships with suppliers.	1	2	3	4	5	6	7
We spend considerable effort on collaborating with distributors.	1	2	3	4	5	6	7
We maintain good relationships with distributors.	1	2	3	4	5	6	7

Which market player group does your company **mostly** collaborate with? (please tick one)

Competitors ☐ Customers ☐ Distributors ☐ Suppliers ☐

Please indicate, by <u>circling one number</u>, the extent to which the following represent the actual situation about your collaboration with the market player you have selected from above. Put a number in the boxes provided on your right, where: *1= not at all, 2= to a slight extent, 3= to a small extent, 4= to a moderate extent, 5= to a considerable extent, 6 = to a great extent, 7 = to an extreme extent.*

In our collaboration with this market player, …	***Not at all***			***To a moderate extent***			***To an extreme extent***
We exchange information related to changes in the technology of products and services.	1	2	3	4	5	6	7
We exchange information related to changes in market structure.	1	2	3	4	5	6	7
We exchange information as soon as possible of any unexpected problems.	1	2	3	4	5	6	7
We exchange information on changes related to our organizations' strategies and policies.	1	2	3	4	5	6	7
We exchange information that is sensitive (e.g. financial performance or technical know-how).	1	2	3	4	5	6	7
We exchange information related to changes in end-user needs, preferences, and behaviour.	1	2	3	4	5	6	7
We influence each other to adjust our common understanding of new business developments.	1	2	3	4	5	6	7
We establish joint teams to solve operational problems related to collaboration.	1	2	3	4	5	6	7
We establish joint teams to analyse and discuss strategic issues.	1	2	3	4	5	6	7
We have a lot of face-to-face communication.	1	2	3	4	5	6	7
We engage in productive discussions encompassing a variety of opinions.	1	2	3	4	5	6	7
We usually adjust our common understanding of end-user needs, preferences, and behaviour.	1	2	3	4	5	6	7
We usually adjust our common understanding of trends in technology related to our business.	1	2	3	4	5	6	7
We frequently evaluate and, if needed, adjust our business routines.	1	2	3	4	5	6	7
We frequently evaluate and, if needed, update the formal business contracts.	1	2	3	4	5	6	7
We frequently meet face-to-face in order to refresh the personal network.	1	2	3	4	5	6	7

As a result of the collaboration with this market player, …	***Not at all***			***To a moderate extent***			***To an extreme extent***
Our business costs have been reduced.	1	2	3	4	5	6	7
Our ability to handle unforeseen fluctuations in business operation has been improved.	1	2	3	4	5	6	7
Our product and service quality has been improved.	1	2	3	4	5	6	7
Our synergies in joint sales and marketing efforts have been achieved.	1	2	3	4	5	6	7
Our ability to develop successful new products and services has been enhanced.	1	2	3	4	5	6	7
Our investments of resources (e.g time, money) in the collaboration have paid off very well.	1	2	3	4	5	6	7

We are able to detect changes in end-user needs and preferences before our competitors do.	1	2	3	4	5	6	7

The following statements are about your company's customer-focused activities. Please circle one number that best suits your answer for each statement.

In our company, …	*Strongly Disagree*			*Neither agree nor disagree*			*Strongly Agree*
Our competitive advantage is based on understanding customers' needs.	1	2	3	4	5	6	7
Our business objectives are driven primarily by customer satisfaction.	1	2	3	4	5	6	7
We frequently and systematically measure customer satisfaction.	1	2	3	4	5	6	7
We rapidly respond to the concerns and complaints of our customers.	1	2	3	4	5	6	7
We strive to build strong relationships with our customers.	1	2	3	4	5	6	7
We devote substantial resources to know our customers' needs.	1	2	3	4	5	6	7
We pay close attention to after-sales service.	1	2	3	4	5	6	7

Please indicate the extent to which the following resources and skills exist in your company.

In our company, …	*Not at all*			*To a moderate extent*			*To an extreme extent*
We possess extensive technical knowledge.	1	2	3	4	5	6	7
We have the necessary skills to capture and acquire excellent market information.	1	2	3	4	5	6	7
We actively seek new ideas in our markets.	1	2	3	4	5	6	7
We have easy access to financial capital to support our business operations.	1	2	3	4	5	6	7
Our employees are experts in their particular jobs and functions.	1	2	3	4	5	6	7
Our staffs are knowledgeable about business practices in our industry.	1	2	3	4	5	6	7

The following statements relate to your personal connections with managers and/or employees of other companies.

As a person, …	*Not at all*			*To a moderate extent*			*To an extreme extent*
I can obtain information about my industry faster than competitors.	1	2	3	4	5	6	7
I can obtain resources needed for business success faster than competitors.	1	2	3	4	5	6	7
I have a professional relationship with someone influential in my industry.	1	2	3	4	5	6	7
I have engaged with someone influential in my industry in informal social activity (e.g. playing and supporting football).	1	2	3	4	5	6	7

SECTION C

This section seeks information about your company's management of cooperation with its competitors. To answer the questions in this section, please reflect on your company's cooperation, collaboration and partnerships with other companies in your line of business (competing partners).

Does your company cooperate with some of its competitors? (please tick) Yes ☐ No ☐

If your answer is No, go to section F on page 7. If YES, please answer the following questions :-

In our company, …	***Strongly Disagree***			***Neither agree nor disagree***			***Strongly Agree***
Cooperative activities with our competing partners are well coordinated.	1	2	3	4	5	6	7
We ensure that joint work tasks with our competing partners fit very well.	1	2	3	4	5	6	7
We ensure that joint work with our competing partners is harmonised.	1	2	3	4	5	6	7
We systematically coordinate our strategies across different partnerships with competitors.	1	2	3	4	5	6	7
There is a great deal of communication with our competing partners on most decisions.	1	2	3	4	5	6	7
There is coordination among the cooperative activities of our different competing partners.	1	2	3	4	5	6	7
We determine areas of synergy with our competing partners.	1	2	3	4	5	6	7
We ensure that interdependencies between our competing partners are identified.	1	2	3	4	5	6	7
We determine if there are overlaps between our different competing partners.	1	2	3	4	5	6	7
We have the capability to learn from our competing partners.	1	2	3	4	5	6	7
We have the managerial competence to absorb new knowledge from our competing partners.	1	2	3	4	5	6	7
We have adequate routines to analyse the information obtained from our competing partners.	1	2	3	4	5	6	7
We conduct periodic reviews of our partnerships with competitors.	1	2	3	4	5	6	7
We modify relationships with our competing partners as we learn from experience.	1	2	3	4	5	6	7
We integrate our existing knowledge with new information acquired from competing partners.	1	2	3	4	5	6	7
We pre-empt our competition by entering into partnership opportunities with our competitors.	1	2	3	4	5	6	7
We often take the initiative in approaching competitors with partnership proposals.	1	2	3	4	5	6	7
We are proactive in finding and going after partnerships with competitors.	1	2	3	4	5	6	7
We monitor our environment to identify partnership-with-competitors opportunities.	1	2	3	4	5	6	7
We gather information about prospective competing partners from various forums (e.g., trade shows, publications, internet etc.).	1	2	3	4	5	6	7
We are alert to market developments that create potential partnership-with-competitors opportunities.	1	2	3	4	5	6	7
We are willing to put aside contractual terms to improve the outcome of our partnerships with competitors.	1	2	3	4	5	6	7
When an unexpected situation arises, we would rather modify a partnership agreement with our competitors than insist on the original terms.	1	2	3	4	5	6	7
We are willing to change our partnership with competitors in case of any change in the business environment.	1	2	3	4	5	6	7
Flexibility, in response to a request for change, is characteristic of our partnership-with-competitors' management process.	1	2	3	4	5	6	7

SECTION D

Please indicate the extent to which you agree with the following statements about your company's cooperation with competitors learning process. *(1= strongly disagree, 2= disagree, 3= slightly disagree, 4= Neither disagree nor agree 5=slightly agree, 6= agree, 7= strongly agree).*

In our company, …	***Strongly Disagree***			***Neither agree nor disagree***			***Strongly Agree***
There is a great deal of support for the management of partnerships with competitors.	1	2	3	4	5	6	7
There are units primarily dedicated to the management of partnerships with competitors.	1	2	3	4	5	6	7
We have a porous organizational boundary that facilitates better communication with our competing partners.	1	2	3	4	5	6	7
Our organizational structure can be characterized as a flexible value-adding network.	1	2	3	4	5	6	7
There is an employee(s) primarily dedicated to the management of partnerships with competitors.	1	2	3	4	5	6	7
The manager involved with partnerships with competitors is regularly debriefed about their prior and/or current partnership experience.	1	2	3	4	5	6	7
The manager responsible for partnerships with competitors maintains a report of all major partnership decisions.	1	2	3	4	5	6	7
The manager regularly reports on the performance of the partnerships with competitors.	1	2	3	4	5	6	7
We maintain a database containing factual information of each of our partnerships with competitors (e.g., date and purpose of formation).	1	2	3	4	5	6	7
We maintain a contact list of individuals from within who can provide assistance on partnerships with competitors.	1	2	3	4	5	6	7
We maintain a contact list of individuals from outside who can provide assistance on partnerships with competitors.	1	2	3	4	5	6	7
The manager follows a well-defined process to guide the formation or management of any partnership with competitors.	1	2	3	4	5	6	7
Guidelines are developed and used to assist managerial decision making while forming or managing partnerships with competitors.	1	2	3	4	5	6	7
Manuals (containing tools) are developed and used to assist managerial decision making while forming or managing partnerships with competitors.	1	2	3	4	5	6	7
We update the guidelines or manuals related to partnerships with competitors	1	2	3	4	5	6	7
Management conducts a collective review to assess the progress and performance of its partnerships with competitors.	1	2	3	4	5	6	7
Management participates in forums such as committees to take stock of their management experience related to partnerships with competitors.	1	2	3	4	5	6	7
Management participates in forums such as meetings, to exchange information and experiences related to partnerships with competitors.	1	2	3	4	5	6	7
Management engages in informal sharing and exchange of information related to partnerships with competitors with colleagues.	1	2	3	4	5	6	7
Managers with prior experience in managing partnerships with competitors are usually rotated across some of the company's partnerships.	1	2	3	4	5	6	7

Managerial incentives are used to encourage individual managers to share their management experience related to partnerships with competitors.	1	2	3	4	5	6	7
Managers attend in-house training programs on managing partnerships with competitors.	1	2	3	4	5	6	7
Managers attend externally conducted training programs on managing partnerships with competitors.	1	2	3	4	5	6	7
We provide opportunities for on-the-job training to individuals who are relatively new to managing partnerships with competitors.	1	2	3	4	5	6	7
We provide managers access to information on prior and ongoing partnerships with competitors.	1	2	3	4	5	6	7

SECTION E

This section seeks your overall assessment of the performance of your company's partnerships with its competitors. Please circle a number to indicate the extent to which you agree with each of the following statements, where: *1=strongly disagree, 2= disagree, 3= slightly disagree, 4= neither agree nor disagree, 5= slightly agree, 6= agree, 7= strongly agree.*

	Strongly Disagree			***Neither agree nor disagree***			***Strongly Agree***
Our partnerships with competitors are characterized by strong and harmonious relationships.	1	2	3	4	5	6	7
Our company has achieved its primary objective in forming the partnerships with competitors.	1	2	3	4	5	6	7
Our company's competitive position has been greatly enhanced due to partnerships with competitors.	1	2	3	4	5	6	7
Our company has been successful in learning some critical skills or capabilities from its competing partners.	1	2	3	4	5	6	7
The partnerships with competitors have achieved the set goals.	1	2	3	4	5	6	7
The time and effort spent by the partners in developing and maintaining the partnerships has been worthwhile.	1	2	3	4	5	6	7
The relationships between our company and its competing partners have been very effective.	1	2	3	4	5	6	7
We have very rewarding relationships with our competing partners.	1	2	3	4	5	6	7
The partnerships with competitors have not been productive enough.	1	2	3	4	5	6	7
In our partnerships with competitors, resources are deployed efficiently.	1	2	3	4	5	6	7
Procedures and mechanisms for the management of the partnerships with competitors are cost-effective.	1	2	3	4	5	6	7
Procedures and mechanisms for the management of the partnerships with competitors are less time consuming.	1	2	3	4	5	6	7
Our partnerships with competitors are not effective in converting resource inputs into venture outputs.	1	2	3	4	5	6	7
Our partnership operations with competitors can adapt quickly to environmental changes.	1	2	3	4	5	6	7
We are able to make adjustments in partnership with our competitors to cope with changing circumstances.	1	2	3	4	5	6	7
Whenever some unexpected situation arises, we are capable of modifying the existing structure of our partnerships with our competitors.	1	2	3	4	5	6	7
In the face of problems, we cannot make adjustments to cooperative relationships with our competitors as required.	1	2	3	4	5	6	7

For the following questions, please tick a box to indicate your answer.

Do you have a unit or function in your company that is primarily dedicated to the management of your cooperation with competitors? Yes ☐ No ☐

Approximately what percentage of your annual SALES turnover is derived from cooperative activities with your competitors?

0% 5% 10% 15% 20% 25% 30% 35% 40% 45% 50% 55% 60% 65% 70% 75% 80% 85% 90% 95% 100%

Approximately what percentage of your annual PROFIT is derived from cooperative activities with your competitors?

0% 5% 10% 15% 20% 25% 30% 35% 40% 45% 50% 55% 60% 65% 70% 75% 80% 85% 90% 95% 100%

For the following questions, please write your answers in the space provided.

How many partnerships have you formed over the last five years?.....……..

How many of these partnerships have you formed with your competitors (companies operating in the same business area)?.....

Please indicate the number of partnerships with competitors your company has had since initial formation?.....

How many partnerships with competitors is your company involved in at present?.....

For how long has your company been cooperating with competitors?.....…….years.

Please circle one number to indicate the kind of cooperative agreements you have with your competitors.

Our cooperative agreements with competitors are …

Highly Informal	***informal***	***Slightly informal***	***Neither informal nor formal***	***Slightly Formal***	***Formal***	***Highly Formal***
1	2	3	4	5	6	7

Please choose the areas in which you cooperate with your competitors. (please tick)

☐ Equipment and technical support ☐ Financial support ☐ Employee training

☐ Subcontracting ☐ Tender submission ☐ Supply of raw materials

☐ Joint advertising ☐ Joint product distribution ☐ Information sharing

☐ Other (please specify)……..

SECTION F

This section seeks information on your company's performance. As earlier stated, please be assured that your responses will be treated in **strictest confidence**, with the results collected being **anonymised** and **used for statistical purposes only**.

For each of the following performance measures, use the left side to evaluate your company's past year's performance and the right side to project your performance for the next year.

Past year's performance.								**Performance projection for the next year.**						
Much lower than target						***Much higher than target***		***Much lower than target***						***Much higher than target***
1	2	3	4	5	6	7	Customer satisfaction	1	2	3	4	5	6	7
1	2	3	4	5	6	7	Customer retention	1	2	3	4	5	6	7
1	2	3	4	5	6	7	New customer generation	1	2	3	4	5	6	7
1	2	3	4	5	6	7	Customer service	1	2	3	4	5	6	7

1	2	3	4	5	6	7	Customer referral	1	2	3	4	5	6	7
1	2	3	4	5	6	7	Company's competitiveness	1	2	3	4	5	6	7
1	2	3	4	5	6	7	Company's strategic position	1	2	3	4	5	6	7
1	2	3	4	5	6	7	Company's market share	1	2	3	4	5	6	7
1	2	3	4	5	6	7	Company's reputation	1	2	3	4	5	6	7
1	2	3	4	5	6	7	Cash flows	1	2	3	4	5	6	7
1	2	3	4	5	6	7	Sales volume	1	2	3	4	5	6	7
1	2	3	4	5	6	7	Sales growth	1	2	3	4	5	6	7
1	2	3	4	5	6	7	New product/service sales	1	2	3	4	5	6	7
1	2	3	4	5	6	7	Profitability as a percentage of sales	1	2	3	4	5	6	7
1	2	3	4	5	6	7	Return on investment (ROI)	1	2	3	4	5	6	7
1	2	3	4	5	6	7	Profit growth	1	2	3	4	5	6	7
1	2	3	4	5	6	7	Profit growth	1	2	3	4	5	6	7
1	2	3	4	5	6	7	Reaching company financial goals	1	2	3	4	5	6	7
1	2	3	4	5	6	7	Return on assets (ROA)	1	2	3	4	5	6	7

SECTION G

Please write your answers to the following questions about your company's general information in the space on your right.

In what industry does your company operate? …….....

How many years has your company been in this business? …….....years.

How many full-time employees does your company have? ……..……..….Employees.

Please indicate the (approximate) annual sales of your company in the last year.……..…..ZMK.

Please indicate the (approximate) annual profit of your company in the last year……ZMK.

SECTION H

Finally, please choose one option on each of the following questions to indicate your role as a respondent.

	Strongly Disagree			***Neither agree nor disagree***			***Strongly Agree***
The questionnaire deals with issues I am very knowledgeable about.	1	2	3	4	5	6	7
I am completely confident about my answers to the questions.	1	2	3	4	5	6	7
I am confident that my answers reflect the company's situation.	1	2	3	4	5	6	7

Your current position held: ……..

Your number of years working for the company:….....years.

Your number of years working in this industry……..……..……..years.

Gender (please tick) : Male ☐ Female ☐

Would you like to receive a summary of the study's findings? Yes ☐ No ☐

Email: ……..... Phone number: ……..

Additional Comments (optional):

……

……..

……

Once again, we are so grateful that you took the time to participate in this study.

Appendix 4C: Ethical approval

Performance, Governance and Operations
Research & Innovation Service
Charles Thackrah Building
101 Clarendon Road
Leeds LS2 9LJ Tel: 0113 343 4873
Email: ResearchEthics@leeds.ac.uk

UNIVERSITY OF LEEDS

Stella Zulu-Chisanga
LUBS
Marketing Division
University of Leeds
Leeds, LS2 9JT

ESSL, Environment and LUBS (AREA) Faculty Research Ethics Committee
University of Leeds

8 September 2014

Dear Stella

Title of study:	**Drivers, boundary conditions and performance of coopetition capability**
Ethics reference:	**AREA 13-162**

I am pleased to inform you that the above research application has been reviewed by the ESSL, Environment and LUBS (AREA) Faculty Research Ethics Committee and following receipt of your response to the Committee's initial comments, I can confirm a favourable ethical opinion as of the date of this letter. The following documentation was considered:

Document	Version	Date
AREA 13-162 ethical review response form.docx	1	12/08/14
AREA 13-162 Ethical review form -Stella.docx	2	17/07/14
AREA 13-162 Fieldwork_Risk_Assessment_Form_2013-Stella.docx	1	17/07/14
AREA 13-162 information sheet - Stella.docx	1	17/07/14

Please notify the committee if you intend to make any amendments to the original research as submitted at date of this approval, including changes to recruitment methodology. All changes must receive ethical approval prior to implementation. The amendment form is available at http://ris.leeds.ac.uk/EthicsAmendment.

Please note: You are expected to keep a record of all your approved documentation, as well as documents such as sample consent forms, and other documents relating to the study. This should be kept in your study file, which should be readily available for audit purposes. You will be given a two week notice period if your project is to be audited. There is a checklist listing examples of documents to be kept which is available at http://ris.leeds.ac.uk/EthicsAudits.

We welcome feedback on your experience of the ethical review process and suggestions for improvement. Please email any comments to ResearchEthics@leeds.ac.uk.

Yours sincerely

Jennifer Blaikie
Senior Research Ethics Administrator, Research & Innovation Service
On behalf of Dr Andrew Evans, Chair, AREA Faculty Research Ethics Committee
CC: Student's supervisor(s)

Appendix 5A: Descriptive findings for control variables

Item	Response scale							Scale descriptive	
	Not at all						To an extreme extent		
collaboration with other market players	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**Mean**	**SD**
We spend considerable effort on collaborating with customers.	1.6%	0.4%	2.8%	7.5%	9.5%	45.3%	33.1%	5.91	1.19
We maintain good relationships with customers.	0.4%	0%	0.4%	3.5%	9.1%	38.6%	48%	6.29	0.88
We spend considerable effort on collaborating with suppliers.	1.6%	0.4%	4.3%	11%	12.6%	34.7%	35.4%	5.78	1.31
We maintain good relationships with suppliers.	0.8%	1.2%	2.4%	7.5%	16.5%	31.5%	40.2%	5.93	1.21
We spend considerable effort on collaborating with distributors.	3.5%	3.9%	2.4%	9.1%	16.6%	41.8%	22.8%	5.48	1.49
We maintain good relationships with distributors.	3.5%	2.8%	0.8%	8.7%	14.6%	38.6%	31.1%	5.68	1.45
Coopetition structure	**Strongest disagree**						**Strongly agree**		
There is a great deal of support for the management of partnerships with competitors.	13.4%	9.4%	11.8%	24.4%	24%	10.6%	6.3%	3.93	1.71
There are units primarily dedicated to the management of partnerships with competitors.	16.9%	9.8%	12.6%	18.9%	24.4%	13%	4.3%	3.8%	1.78
We have a porous organizational boundary that facilitates better communication with our competing partners.	12.6%	13.4%	10.2%	18.9%	20.5%	16.1%	8.3%	4.03	1.84
Our organizational structure can be characterized as a flexible value-adding network.	2.4%	5.9%	3.9%	18.5%	34.7%	25.2%	9.4%	4.9	1.37
There is an employee(s) primarily dedicated to the management of partnerships with competitors.	13.8%	14.6%	7.1%	20.9%	21.7%	15.7%	6.7%	3.96	1.83

Appendix 6A: Initial EFA results for set 1

	Component							
ITEM	ARTIC	INST	CMKTP	MTIE	SHAR	INTERN	CMKTP2	CODI
INST1	.12	**.483**	-.115	-.203	.031	.253	.008	-.162
INST2	.06	**.670**	.015	-.148	-.048	.280	.034	-.263
INST3	.05	**.665**	.032	-.230	.013	.257	.050	-.313
INST4	.06	**.773**	-.128	.091	-.044	-.053	-.030	.041
INST5	-.054	**.827**	-.069	.062	.012	-.138	-.022	.072
INST6	-.049	**.863**	.032	.185	.131	-.088	.006	.082
CMKTP1	-.003	-.012	-.129	.059	-.152	-.069	**.814**	.040
CMKTP2	-.082	-.036	-.122	.154	.120	.013	**.797**	.100
CMKTP3	-.004	.064	**-.833**	.051	-.038	.024	.093	.082
CMKTP4	-.046	-.049	**-.925**	.042	.014	.022	-.158	-.016
CMKTP5	.010	.075	**-.799**	-.078	-.004	-.020	.182	.000
CMKTP6	.009	.032	**-.792**	-.078	-.014	-.020	.177	-.058
MTIE1	.094	.125	-.032	**.809**	-.037	.003	.100	-.092
MTIE2	.072	.040	.057	**.783**	.073	.129	.142	-.253
MTIE3	-.018	.011	-.124	**-.714**	-.065	-.102	-.153	-.380
MTIE4	-.064	.029	.051	**-.848**	.058	-.022	-.009	-.096
ARTIC1	**.702**	-.174	-.027	-.024	.110	.153	.079	-.110
ARTIC2	**.619**	-.160	-.131	-.017	.203	.073	-.008	-.209
ARTIC3	**.576**	-.176	-.046	-.079	.293	.256	.146	-.130
ARTIC4	**.556**	-.140	-.113	.097	.270	.006	-.010	-.075
ARTIC5	**.529**	-.038	-.114	.022	.367	-.148	-.132	.019
ARTIC6	**.404**	-.098	-.100	-.015	.333	-.227	-.224	-.076
CODI1	.123	.062	-.027	-.018	.020	.038	-.019	**.915**
CODI2	.002	.012	.028	.053	-.056	-.094	.005	**.919**
CODI3	.069	.125	.057	.097	-.008	-.087	-.027	**.889**
CODI4	-.005	.078	.051	-.006	-.109	-.080	-.010	**.927**
SHAR1	.451*	.045	.091	.029	**.469**	.171	.193	-.021
SHAR2	.023	-.008	-.039	-.073	**.799**	.041	-.006	-.072
SHAR3	.088	.038	.009	.058	**.824**	-.031	.005	.002
SHAR4	-.101	.068	-.025	.029	**.948**	.053	-.074	.120
SHAR5	.111	-.059	.071	.003	**.680**	-.086	.099	-.133
SHAR6	.054	.023	.035	-.047	**.677**	-.198	.141	-.115
INTERN1	.170	.079	.089	-.236	.322	**-.462**	.263	-.298
INTERN2	.181	.080	-.083	-.172	.294	**-.457**	.148	-.215
INTERN3	.227	.119	-.086	-.191	.111	**-.630**	.100	-.182
INTERN4	.461*	.091	-.052	-.164	.047	**-.497**	.175	-.130

Extraction Method: Principal Component Analysis. Rotation Method: Oblimin with Kaiser Normalization. a. Rotation converged in 19 iterations

Appendix 6Ai: Initial eigenvalues for set 1

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings[a]
	Total	Var. %	Cum. %	Total	Var. %	Cum. %	Total
1	12.22	33.96	33.96	12.22	33.96	33.96	10.28
2	4.42	12.27	46.23	4.42	12.27	46.23	3.86
3	2.93	8.15	54.37	2.93	8.15	54.37	3.87
4	2.03	5.63	60.00	2.03	5.63	60.00	1.96
5	1.52	4.22	64.23	1.52	4.22	64.23	8.90
6	1.44	4.01	68.23	1.44	4.01	68.23	2.57
7	1.18	3.27	71.50	1.18	3.27	71.50	3.03
8	1.02	2.82	74.32	1.02	2.82	74.32	4.24
9	.93	2.57	76.89				
10	.86	2.40	79.29				
11	.70	1.95	81.25				
12	.63	1.76	83.00				
13	.54	1.51	84.52				
14	.52	1.44	85.96				
15	.49	1.37	87.33				
16	.44	1.22	88.55				
17	.42	1.16	89.72				
18	.37	1.04	90.76				
19	.33	.92	91.67				
20	.32	.90	92.57				
21	.30	.83	93.40				
22	.25	.68	94.08				
23	.24	.67	94.75				
24	.23	.64	95.40				
25	.20	.57	95.96				
26	.20	.55	96.52				
27	.18	.51	97.03				
28	.16	.44	97.47				
29	.16	.44	97.90				
30	.15	.41	98.31				
31	.14	.38	98.69				
32	.11	.31	99.01				
33	.10	.29	99.30				
34	.10	.28	99.58				
35	.08	.22	99.80				
36	.07	.20	100.00				

Extraction Method: Principal Component Analysis. a. When components are correlated, sums of squared loadings cannot be added to obtain a total variance.

Appendix 6B: Initial EFA results for set 2

	Component						
	PCOORD	**TRANS**	**LEARN**	**CSTRU**	**CPERF**	**ICOORD**	**PROAC**
ICOORD1	-.027	.161	-.034	-.012	.093	**.841**	.035
ICOORD2	.043	-.030	-.070	.080	.029	**.748**	-.208
ICOORD3	-.021	.056	-.225	.000	-.140	**.653**	.056
ICOORD4	.431	.041	-.048	.067	-.097	**.489**	.135
ICOORD5	.420	-.034	.133	.053	-.287	**.458**	-.117
PCOORD1	**.467**	.030	.104	.049	-.226	.333	-.100
PCOORD2	**.655**	.093	.015	-.037	-.047	.302	-.129
PCOORD3	**.447**	.066	-.274	.204	-.159	.147	.012
PCOORD4	**.630**	-.019	-.226	.160	.037	.121	-.030
LEARN1	.029	.049	**-.779**	-.032	-.057	.044	-.006
LEARN2	.165	-.066	**-.798**	-.054	.017	.092	-.055
LEARN3	.179	-.135	**-.692**	-.141	-.121	.103	-.155
LEARN4	.258	.066	**-.324**	.063	-.276	.178	-.073
LEARN5	.536	.104	**-.453**	.119	-.073	-.057	-.079
LEARN6	.402	.164	**-.644**	.022	-.145	-.102	.067
PROAC1	.423	.237	-.015	.164	.063	-.109	**-.452**
PROAC2	.233	.201	.007	.056	-.070	-.078	**-.730**
PROAC3	-.112	.035	.003	.089	-.092	.054	**-.832**
PROAC4	-.178	.083	-.333	.006	-.097	.022	**-.645**
PROAC5	-.208	.139	-.687	.120	.139	.106	-.108
PROAC6	-.216	.150	-.534	.088	-.105	.183	-.200
TRANS1	-.023	**.839**	.106	.150	.120	.030	-.054
TRANS2	.013	**.843**	.013	-.106	-.099	.091	.031
TRANS3	-.032	**.762**	-.052	.035	-.049	.004	-.168
TRANS4	.013	**.827**	-.084	-.039	-.066	.066	-.046
CSTRU1	-.052	.124	.094	**.805**	-.104	-.045	-.015
CSTRU2	.071	.032	.048	**.840**	.012	.065	-.115
CSTRU3	-.137	-.282	-.107	**.658**	-.042	.268	-.128
CSTRU4	-.235	-.017	-.463	**.433**	-.132	.040	.043
CSTRU5	.304	.083	.058	**.780**	-.050	-.145	.006
CPERF1	.006	-.123	.052	.075	**-.726**	.142	-.116
CPERF2	.153	-.028	.118	-.047	**-.785**	.126	-.153
CPERF3	-.091	.062	-.007	.092	**-.845**	-.168	-.073
CPERF4	-.119	.222	-.191	.057	**-.752**	-.089	.177

Extraction Method: Principal Component Analysis.

Rotation Method: Oblimin with Kaiser Normalization.

Appendix 6Bi: Initial eigenvalues for set 2

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings[a]
	Total	Var. %	Cum. %	Total	Var. %	Cum. %	Total
1	12.518	36.818	36.818	12.518	36.818	36.818	4.771
2	2.963	8.716	45.534	2.963	8.716	45.534	5.074
3	2.421	7.119	52.653	2.421	7.119	52.653	6.826
4	2.272	6.682	59.335	2.272	6.682	59.335	5.496
5	1.636	4.811	64.146	1.636	4.811	64.146	6.305
6	1.280	3.766	67.912	1.280	3.766	67.912	5.869
7	1.096	3.224	71.136	1.096	3.224	71.136	5.643
8	.900	2.647	73.783				
9	.813	2.390	76.174				
10	.730	2.147	78.320				
11	.701	2.060	80.381				
12	.608	1.787	82.168				
13	.551	1.621	83.789				
14	.498	1.463	85.253				
15	.489	1.438	86.691				
16	.438	1.288	87.979				
17	.406	1.195	89.174				
18	.405	1.191	90.366				
19	.342	1.007	91.372				
20	.336	.990	92.362				
21	.286	.841	93.203				
22	.254	.747	93.951				
23	.248	.729	94.679				
24	.237	.698	95.377				
25	.219	.645	96.022				
26	.212	.624	96.646				
27	.197	.580	97.226				
28	.165	.484	97.711				
29	.159	.468	98.179				
30	.150	.441	98.620				
31	.138	.407	99.026				
32	.125	.369	99.395				
33	.112	.330	99.725				
34	.093	.275	100.000				

Extraction Method: Principal Component Analysis. a. When components are correlated, sums of squared loadings cannot be added to obtain a total variance.

Appendix 6C: Inter item correlations

Managerial ties				
	MTIE1	MTIE2	MTIE3	MTIE4
MTIE1	1			
MTIE2	.68	1		
MTIE3	.37	.42	1	
MTIE4	.31	.33	.57	1

Institutional support						
	INST1	INST2	INST3	INST4	INST5	INST6
INST1	1					
INST2	.66	1				
INST3	.62	.73	1			
INST4	.36	.49	.50	1		
INST5	.35	.44	.47	.58	1	
INST6	.32	.49	.52	.60	.72	1

Collaboration with other market players					
	CMKTP1	CMKTP2	CMKTP3	CMKTP4	CMKTP5
CMKTP1	1				
CMKTP2	.56	1			
CMKTP3	.39	.38	1		
CMKTP4	.32	.33	.74	1	
CMKTP5	.44	.37	.66	.61	1
CMKTP6	.43	.35	.62	.60	.85

Coopetition interfirm coordination					
	ICOORD1	ICOORD2	ICOORD3	ICOORD4	ICOORD5
ICOORD1	1				
ICOORD2	.69	1			
ICOORD3	.55	.58	1		
ICOORD4	.36	.48	.55	1	
ICOORD5	.47	.57	.46	.60	1

Coopetition portfolio coordination				
	PCOORD1	PCOORD2	PCOORD3	PCOORD4
PCOORD1	1.000			
PCOORD2	.714	1.000		
PCOORD3	.469	.498	1.000	
PCOORD4	.547	.618	.566	1.000

Coopetition learning				
	LEARN1	LEARN2	LEARN3	LEARN6
LEARN1	1.000			
LEARN2	.741	1.000		
LEARN3	.594	.705	1.000	
LEARN6	.597	.615	.553	1.000

Coopetition proactiveness				
	PROAC1	PROAC2	PROAC3	PROAC4
PROAC1	1.000			
PROAC2	.658	1.000		
PROAC3	.508	.729	1.000	
PROAC4	.379	.613	.613	1.000

Coopetition transformation				
	TRANS1	TRANS2	TRANS3	TRANS4
TRANS1	1.000			
TRANS2	.612	1.000		
TRANS3	.664	.611	1.000	
TRANS4	.646	.704	.723	1.000

Coopetition structure				
	CSTRU1	CSTRU2	CSTRU3	CSTRU5
CSTRU1	1.000			
CSTRU2	.715	1.000		
CSTRU3	.453	.608	1.000	
CSTRU5	.573	.714	.499	1.000

Coopetition performance				
	CPERF1	CPERF2	CPERF3	CPERF4
CPERF1	1.000			
CPERF2	.685	1.000		
CPERF3	.540	.608	1.000	
CPERF4	.405	.521	.641	1.000

Coopetition articulation						
	ARTIC1	ARTIC2	ARTIC3	ARTIC4	ARTIC5	ARTIC6
ARTIC1	1.000					
ARTIC2	.792	1.000				
ARTIC3	.744	.762	1.000			
ARTIC4	.605	.654	.720	1.000		
ARTIC5	.594	.650	.651	.691	1.000	
ARTIC6	.584	.656	.585	.637	.782	1.000

Coopetition codification				
	CODI1	CODI2	CODI3	CODI4
CODI1	1.000			
CODI2	.797	1.000		
CODI3	.722	.818	1.000	
CODI4	.779	.789	.856	1.000

Coopetition sharing						
	SHAR1	SHAR2	SHAR3	SHAR4	SHAR5	SHAR6
SHAR1	1.000					
SHAR2	.651	1.000				
SHAR3	.645	.728	1.000			
SHAR4	.503	.644	.715	1.000		
SHAR5	.614	.587	.697	.542	1.000	
SHAR6	.645	.615	.651	.564	.737	1.000

Coopetition internalisation				
	INTERN1	INTERN2	INTERN3	INTERN4
INTERN1	1.000			
INTERN2	.736	1.000		
INTERN3	.632	.694	1.000	
INTERN4	.681	.743	.765	1.000

Appendix 6D: Initial CFA results for coopetition capability measurement model 1:

Factor	Standardised loadings[a]
COOPETITION CAPABILITY	
Coopetition Interorganisational coordination	**0.84[b]**
ICOORD1	0.73[b]
ICOORD2	0.83(12.16)
ICOORD3	0.74(11.00)
ICOORD4	0.64(9.54)
ICOORD5	0.69(11.78)
Coopetition portfolio coordination	**0.85(12.43)**
PCOORD1	0.82[b]
PCOORD2	0.85(15.70)
PCOORD3	0.82(14.82)
PCOORD4	0.65(10.99)
Coopetition learning	**0.82(10.56)**
LEARN1	0.71[b]
LEARN2	0.77(11.68)
LEARN3	0.77(11.65)
LEARN6	0.82(12.36)
Coopetition proactiveness	**0.74(8.88)**
PROAC1	0.65[b]
PROAC2	0.85(11.06)
PROAC3	0.79(10.52)
PROAC4	0.75(10.15)
Coopetition transformation	**0.52(7.11)**
TRANS1	0.76[b]
TRANS2	0.78(12.51)
TRANS3	0.83(13.30)
TRANS4	0.88(14.11)
Fit Indices: χ^2= 1522.75; *df* = 270; $p < 0.01$; NFI= 0.72; NNFI=0.74; CFI=0.77; RMSEA =0.14. [a]*t*-values in parenthesis; [b]fixed parameter; loadings for second-order constructs in bold.	

Appendix 6E: Factor loadings for coopetition capability competing models

Competing coopetition capability CFA model 1		**Competing coopetition capability CFA model 2**		**Competing coopetition capability CFA model 3**	
Indicants	**Standardized loadings[a]**	**Indicants**	**Standardized loadings[a]**	**Indicants**	**Standardized loadings[a]**
Coopetition Capability		***Coopetition Capability***		***Coopetition Interorganisational Coordination***	
ICOORD1	0.62[b]	ICOORD2	0.73[b]	ICOORD1	0.77[b]
ICOORD2	0.73(9.50)	PCOORD2	0.73(8.43)	ICOORD2	0.88(13.39)
ICOORD3	0.62(8.35)	LEARN2	0.51(6.72)	ICOORD3	0.69(10.87)
		PROAC2	0.59(7.58)	***Coopetition portfolio coordination***	
PCOORD1	0.75(9.63)	TRANS3	0.32(4.36)	PCOORD1	0.85[b]
PCOORD2	0.77(9.79)			PCOORD2	0.89(17.12)
PCOORD3	0.74(9.56)			PCOORD3	0.79(14.74)
				Coopetition learning	
LEARN1	0.51(7.13)			LEARN1	0.80[b]
LEARN2	0.57(7.84)			LEARN2	0.91(15.01)
LEARN3	0.58(7.97)			LEARN3	0.77(11.50)
				Coopetition proactiveness	
PROAC1	0.57(7.85)			PROAC1	0.71[b]
PROAC2	0.64(8.56)			PROAC2	0.94(12.83)
PROAC3	0.55(7.58)			PROAC3	0.77(11.50)
				Coopetition transformation	
TRANS1	0.32(4.73)			TRANS1	0.76[b]
TRANS2	0.40(5.80)			TRANS2	0.88(13.42)
TRANS3	0.49(6.94)			TRANS3	0.83(12.99)

Competing CFA model 1Fit Indices:χ^2 =1271.24; *df* = 90; $p < 0.01$; NFI = 0.52; NNFI = 0.47; CFI = 0.54; RMSEA = 0.23
Competing CFA model 2 Fit Indices:χ^2 = 34.87; *df* = 5; $p = 0.01$; NFI = 0.87; NNFI = 0.76; CFI = 0.88; RMSEA = 0.15
Competing CFA model 3 Fit Indices:χ^2 = 190.21; *df* = 80; $p < 0.01$; NFI = 0.92; NNFI = 0.96; CFI = 0.97; RMSEA = 0.07
[a]*t*-values in parenthesis; [b]Fixed parameter. *RMSEA = Root Mean Square Error of Approximation; NNFI = Non-Normed Fit Index; CFI = Comparative Fit Index.*

Appendix 6F: Initial CFA results for set 2

Factor	Standardised loadings[a]
Coopetition structure	
CSTRU1	0.75[b]
CSTRU2	0.90(14.49)
CSTRU3	0.65(10.30)
CSTRU5	0.80(12.95)
Coopetition knowledge articulation	***0.96[b]***
ARTIC1[b]	0.82[b]
ARTIC2	0.87(17.08)
ARTIC3	0.85(16.38)
ARTIC4	0.79(14.87)
ARTIC5	0.81(15.39))
ARTIC6	0.78(14.63)
Coopetition knowledge Codification	***0.85(13.64)***
CODI1[b]	0.86[b]
CODI2	0.90(19.81)
CODI3	0.90(19.73)
CODI4	0.91(19.93)
Coopetition knowledge Sharing	***0.85(12.61)***
SHAR1[b]	0.79[b]
SHAR2	0.80(14.11)
SHAR3	0.86(15.58)
SHAR4	0.72(12.28)
SHAR5	0.81(14.41)
SHAR6	0.80(14.26)
Coopetition knowledge Internalisation	***0.79(11.82)***
INTERN1[b]	0.81[b]
INTERN2	0.85(15.52)
INTERN3	0.81(14.68)
INTERN4	0.89(16.65)
Coopetition performance	
CPERF1[b]	0.75[b]
CPERF2	0.83(12.39)
CPERF3	0.78(11.76)
CPERF4	0.67(10.08)
Fit Indices: χ^2 = 1460.80; *df* = 370; $p \leq 0.01$; NFI = 0.79; NNFI = 0.82; CFI = 0.82; RMSEA = 0.11; [a]*t*-values in parenthesis; [b]fixed parameter; loadings for second-order constructs in bold	

Appendix 6G: CFA measurement model 2: with coopetition learning as first-order four factor model results

Factor	Standardised loadings[a]
Coopetition structure	
CSTRU2	0.85[b]
CSTRU3	0.61(10.37)
CSTRU5	0.86(16.38)
Coopetition knowledge articulation	
ARTIC1[b]	0.88[b]
ARTIC2	0.90(20.25)
ARTIC3	0.85(18.10)
Coopetition knowledge Codification	
CODI2[b]	0.88[b]
CODI3	0.92(22.09)
CODI4	0.91(21.69)
Coopetition knowledge Sharing	
SHAR2[b]	0.80[b]
SHAR3	0.87(15.11)
SHAR5	0.80(13.69)
Coopetition knowledge Internalisation	
INTERN1[b]	0.86[b]
INTERN2	0.86(16.36)
INTERN3	0.76(13.84)
Coopetition performance	
CPERF1[b]	0.78[b]
CPERF2	0.86(13.04)
CPERF3	0.71(11.11)

Fit Indices: $\chi 2 = 303.08$; $df = 120$; $p < 0.01$; NFI = 0.92; NNFI = 0.96; CFI = 0.97; RMSEA = 0.07; [a]*t*-values in parenthesis; [b]fixed parameter.

Appendix 6H: Initial CFA results for set 3

Factor	Standardised loadings[a]
Institutional support	
INST1	0.68[b]
INST2	0.81(11.09)
INST3	0.82(11.16)
INST4	0.67(9.42)
INST5	0.66(9.31)
INST6	0.69(9.73)
Collaboration with other market players	
CMKTP1	0.48[b]
CMKTP2	0.43(5.50)
CMKTP3	0.74(7.48)
CMKTP4	0.69(7.23)
CMKTP5	0.92(8.08)
CMKTP6	0.89(8.01)
Managerial ties	
MTIE1	0.76[b]
MTIE2	0.86(9.55)
MTIE3	0.54(7.75)
MTIE4	*0.41(5.95)*
Fit Indices: χ^2 = 541.65; df = 101; p ≤0.01; NFI = 0.75; NNFI = 0.75; CFI = 0.78; RMSEA = 0.13;[a]t-values in parenthesis; [b]fixed parameter.	

Appendix 7A: Detailed LISREL output for the four structural equation models

	Coopetition capability				Coopetition performance				Financial performance			
	Model 1a	**Model 2a**	**Model 3a**	**Model 4a**	**Model 1b**	**Model 2b**	**Model 3b**	**Model 4b**	**Model 1c**	**Model 2c**	**Model 3c**	**Model 4c**
Factor	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)
Firm business experience	.01(.15)	-.06(-.72)	-.05(-.64)	-.05(-.65)	.13(1.31)*	.12(1.39)*	.12(1.43)*	.13(1.56)*	.22(1.98)**	.18(1.38)*	.18(1.66)**	.18(1.69)**
Firm size	-.05(-.72)	-.01(-.11)	.00(.03)	.00(.04)	-.12(-1.55)*	-.09(-1.28)	-.07(-1.08)	-.09(-1.28)	-.24(-2.65)***	-.19(-2.12)**	-.19(-2.19)**	-.19(-2.21)**
Coopetition experience	.14(1.80)**	.06(.81)	.06(.82)	.06(.83)	.12(1.42)*	.03(.39)	-.00(-.06)	.01(.20)	.06(.66)	-.00(.10)	.00(.00)	-.00(-.00)
Collaboration with other market players	.16(2.21)**	.07(1.41)*	.08(1.46)*	.16(1.46)*	.16(2.58)***	.09(1.58)*	.08(1.31)*	.07(1.22)	-.07(-.92)	-.13(-2.25)***	-.13(-1.91)**	-.13(-1.89)**
Coopetition structure	.48(8.18)***	-.04(-.53)	-.02(-.31)	-.02(-.31)	.47(7.04)***	.22(3.29)***	-.00(-.03)	.01(.12)	.21(2.98)***	.03(.06)	.02(.25)	.02(.28)
Institutional support		-.12(-2.44)***	-.13(-2.48)***	-.13(-2.48)***			.03(.60)	.02(.32)				
Managerial ties		.16(3.08)***	.16(3.04)***	.16(3.04)***			.01(.23)	.01(.15)				
Coopetition learning processes		.70(9.17)***	.67(8.82)***	.67(8.82)***			.42(4.10)***	.40(3.87)***				
Coopetition capability						.52(7.04)***	.33(3.89)***	.29(3.46)***				
Coopetition performance										.29(2.68)***	.32(2.99)***	.31(2.93)***
Coopetition capability*Institutional support								-.08(-1.51)*				
Coopetition capability*Coopetition learning processes								-.11(-1.97)**				
R^2	**31%**	**53%**	**52%**	**52%**	**32%**	**48%**	**52%**	**54%**	**10%**	**18%**	**19%**	**20%**
X^2/DF	**277.35/67=4.14**	**111.56/60 = 1.86**	**97.16/58 = 1.68**	**90.46/56 =1.62**	**277.35/67=4.14**	**111.56/60 = 1.86**	**97.16/58 = 1.68**	**90.46/56 =1.62**	**277.35/67=4.14**	**111.56/60 = 1.86**	**97.16/58 = 1.68**	**90.46/56 =1.62**
$\Delta\chi^2$(DF)	**-**	**165.79(7)*** **	**14.4(2)*** **	**6.7(2)** **	**-**	**165.79(7)*** **	**14.4(2)*** **	**6.7(2)** **	**-**	**165.79(7)*** **	**14.4(2)*** **	**6.7(2)** **
RMSEA	**0.11**	**0.06**	**0.05**	**0.05**	**0.11**	**0.06**	**0.05**	**0.05**	**0.11**	**0.06**	**0.05**	**0.05**
NNFI	**0.80**	**0.93**	**0.95**	**0.96**	**0.80**	**0.93**	**0.95**	**0.96**	**0.80**	**0.93**	**0.95**	**0.96**
CFI	**0.93**	**0.98**	**0.97**	**0.99**	**0.93**	**0.98**	**0.97**	**0.99**	**0.93**	**0.98**	**0.97**	**0.99**

******P <.01; **P < .05; *p < 0.10; α= critical t-values are 1.282, 1.645 and 2.325 for α = 0.10, α = 0.05, and α = 0.01 respectively. Models 1a, 1b, and 1c = Model 1: Controls; Models 2a, 2b and 2c = Model 2: Main effects; Models 3a, 3b and 3c = Model 3: Controls, Main effects and direct effect of moderators; Models 4a, 4b and 4c = Model 4: Controls, Main effects, direct effect of moderators and interactions***

Appendix 7B: Regression analysis results

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.917	.367		5.226	.000
	Experience - Age	-.034	.075	-.027	-.450	.653
	Firm Size - Employees	-.010	.054	-.010	-.190	.849
	Number of Years Coopeting	.066	.081	.044	.818	.414
	CSTRUC	.004	.045	.007	.100	.920
	CMKTPOC	.065	.045	.071	1.455	.147
	INSTC	-.074	.031	-.117	-2.372	.018
	MTIEC	.123	.041	.145	2.969	.003
	CLPC	.460	.052	.620	8.920	.000

a. Dependent Variable: COOPCAC

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.679[a]	.461	.444	.74472

a. Predictors: (Constant), CLPC, Firm Size - Employees, INSTC, MTIEC, CMKTPOC, Number of Years Coopeting, Experience - Age, CSTRUC

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.553	.582		.950	.343
	Experience - Age	.200	.108	.112	1.845	.066
	Firm Size - Employees	-.080	.078	-.058	-1.037	.301
	Number of Years Coopeting	.043	.118	.020	.361	.718
	CSTRUC	.018	.064	.020	.277	.782
	CMKTPOC	.093	.065	.072	1.436	.152
	INSTC	.015	.046	.016	.319	.750
	MTIEC	.011	.061	.009	.177	.860
	CLPC	.414	.086	.397	4.841	.000
	COOPCAC	.302	.095	.215	3.181	.002
	COPCINST	-.072	.046	-.078	-1.577	.116
	COPCCLP	-.095	.048	-.103	-1.957	.052

a. Dependent Variable: CPERFC

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.667[a]	.445	.420	1.07006

a. Predictors: (Constant), COPCCLP, Firm Size - Employees, MTIEC, CMKTPOC, COPCINST, Number of Years Coopeting, INSTC, CSTRUC, COOPCAC, Experience - Age, CLPC

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	3.108	.284		10.929	.000
	Experience - Age	.095	.063	.113	1.508	.133
	Firm Size - Employees	-.094	.045	-.144	-2.095	.037
	Number of Years Coopeting	.029	.067	.029	.435	.664
	CSTRUC	.022	.029	.053	.789	.431
	CMKTPOC	-.064	.037	-.105	-1.728	.085
	CPERFC	.139	.032	.296	4.340	.000

a. Dependent Variable: FPERF_OB

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	14.246	6	2.374	6.147	.000[b]
	Residual	95.398	247	.386		
	Total	109.644	253			

a. Dependent Variable: FPERF_OB

b. Predictors: (Constant), CPERFC, Firm Size - Employees, CMKTPOC, Number of Years Coopeting, CSTRUC, Experience – Age

Appendix 7C: Institutional support as a driver in small and large firms

Correlations

SIZEGRP			COOPCAC	INSTC
LOW SIZE	COOPCAC	Pearson Correlation	1	-.015
		Sig. (1-tailed)		.432
		N	126	126
	INSTC	Pearson Correlation	-.015	1
		Sig. (1-tailed)	.432	
		N	126	126
HIGH SIZE	COOPCAC	Pearson Correlation	1	.053
		Sig. (1-tailed)		.275
		N	128	128
	INSTC	Pearson Correlation	.053	1
		Sig. (1-tailed)	.275	
		N	128	128