School of Information Systems

The Role of Social Capital and ICTs in Inter-Organizational Collaboration in a Developing Economy: An Empirical Study of the Finance Industry in Sri Lanka

Dasuni Priyanwada Nawinna

This thesis is presented for the Degree of
Doctor of Philosophy
of
Curtin University

September 2017

Declaration

To the best of my knowledge and belief this thesis contains no material previously published by any other person except where due acknowledgment has been made.

This thesis contains no material which has been accepted for the award of any other degree or diploma in any university.

Signature: …….

Date: **28th September 2017**

Acknowledgement

"*A dream you dream alone is only a dream. A dream you dream together is reality*."

-John Lennon

To undertake doctoral studies is not something one can take lightly. It requires an intense desire, dedication, and commitment on the part of the student. Nonetheless, such a demanding mission may not be accomplished without the endless support and encouragement of many individuals. Today, I would like to convey my sincere gratitude to those who supported me in numerous ways during the course of my PhD candidature and made the completion of this thesis possible.

I shall convey my heartfelt gratitude to my supervisor, Associate Professor John Venable whose enduring support, guidance and patience proved invaluable and made the completion of this thesis possible. I'm indebted to him for taking me on board when my first supervisor retired, giving me hope and guidance to become a researcher with integrity. I'm also thankful to my former supervisor, Associate Professor Helen Armstrong for providing me with the opportunity to undertake this study and for all the support in the initial stages of the study. My sincere gratitude is also conveyed to all the friendly staff of the School of Information Systems at Curtin University for their support, especially during my visits to Curtin University.

Several organizations have played a particularly important role in my data collection efforts. I wish to thank Lanka Clear (Pvt) Ltd. and all the banking organizations in Sri Lanka for their support during the data collection stage of this study. I'm especially thankful to Mr. Sunimal Weerasuriya, former CEO of Lanka Clear for the help extended during the data collection stage.

I'm also thankful to the management of SLIIT and my senior colleagues for supporting me in various ways during my study period. In particular, I wish to thank Professor Lalith Gamage, Professor Mahesha Kapurubandara, Professor Samantha Thelijjagoda, Dr. Kosala Yapa Bandara, Dr. Pradeep Abeygunawardhana, Mr. Indraka Udayakumara and Mr. Prasanna Sumathipala for the guidance and support extended to me. I'm also obliged to my dear collegues, Ajith Perera and Sachinthana Jayasinghe

for their valuable feedback and guidance during the statistical analysis phase of this study.

I wish to thank all my dear friends who encouraged me in numerous ways during the course of my study. I'm especially thankful to my beloved friends in Perth for taking care of me during my visits to Curtin.

Most of all, I would like to express my utmost gratitude to my beloved family for being my source of courage to accomplish this important goal. I'm truly grateful to my dear husband, Chinthaka Wegapitiya for his immense understanding and patience towards someone who was trying to fulfil a lifelong ambition. I'm forever indebted to my father J. Nawinna, mother Rani Rajapakse for everything they have done for me. I'm grateful to my dear brother and sister, Isuru and Sumudu for being there for me always. I dearly hope I have made them all proud.

Table of Contents

List of Abbreviations

AVE	Average variance extracted
CFA	Confirmatory factor analysis
COG	Cognitive Social Capital
COL	Collaboration
CSR	Corporate Social Responsibility
EDI	Electronic Data Interchange
f^2	f Squared (Effect Size)
GoF	Goodness-of-Fit
HREC	Human Resource Ethics Committee
ICT	Information and Communication Technology
IOC	Inter Organizational Collaboration
IOR	Inter Organizational Relationships
IOS	Inter Organizational System
IS	Information System
LV	Latent Variable
LCB	Licenced Commercial Bank
MV	Measured Variable
NIM	Net Interest Margin
ORA	Organizational Risk Analyzer
PLS	Partial Least Squares
REL	Relational Social Capital
ROA	Return on Assets
ROE	Return on Equity
ROI	Return on Investment
R^2	R Squared (Coefficient of Determination)
SME	Small and Medium-Sized Enterprise
SEM	Structural Equation Modelling
SFL	Standard Factor Loading
SC	Social Capital
SNA	Social Network Analysis
SPSS	Statistical Package for Social Sciences
STR	Structural Social Capital

List of Figures

List of Tables

APPENDICES

A. Consent Form

B. Information Sheet

C. Survey Instrument

D. Descriptive Statistics

E. Publications Arising from this Thesis

Abstract

In the contemporary world of business, organizations cannot rely solely on their internal strengths to survive. Forming inter-organizational partnerships is becoming one of the most popular strategies available to an organization to share risks, resources and other capabilities with partners. Collaborative business strategies are especially beneficial in the emerging economies where organizations are constrained with lack of resources, technology, skills and infrastructure. Accordingly, explaining why and how some organizations do better in inter-organizational relationships (IORs) than others is a dominant challenge in the study of IORs.

Social capital (SC) is an influential concept in understanding why and how some organizations do better in inter-organizational relationships. It is recognized as an important factor in developing relationships of trust, forming the foundation for greater collaboration and successful collective action. Social capital is a multi-dimensional, relational concept that turns into a powerful tool when combined with the network analysis approach and tools to study inter-organizational relationships such as alliances and joint ventures or collaborations of any form. While social capital has been found to support different firm-level value creations, such as creation of intellectual capital, resource exchange, innovation, knowledge sharing and performance, it has significance as the basis for the development of stakeholder relationships, which are essential to Corporate Social Responsibility (CSR). CSR is touted as a key enabler of both organizational performance and of sustainable development, which are also essential for developing economies.

Information Systems (IS) researchers have increasingly become interested in exploring social capital in relation to Information and Communications Technologies (ICT). It is evident that social capital and ICT are mutually complementary in the inter-organizational-level. While the role of social capital in the development or acceptance of ICTs and the role of ICTs in the formation of Social Capital is widely explored, the combined effect of SC and ICT on the IOR in developing contexts remains unexplored. Very little is known about the effect of ICT enabled Social Capital in the inter-bank context.

The aim of this empirical research is to develop a model of how ICT-enabled social capital affects inter-bank strategic collaboration in a developing context, Sri Lanka. The purpose of this study is to investigate how the multiple dimensions of social capital influence the strategic collaboration in the Sri Lankan banking context, and the enabling role of ICTs. In order to accomplish this objective, the researcher uses quantitative techniques, the structural modelling approach combined with network measurements. Data is gathered through a survey of high-level management of banks and from public sources such as annual reports and web sites. The network analysis tools (e.g. ORA) and the statistical analysis methods (PLS-SEM) and tools (e.g. SmartPLS) have been used to derive results.

The results of this study suggest that structural, relational dimensions of social capital have a positive influence towards the degree of strategic collaboration of banks. It is also evident that higher ICT capabilities at the firm-level strengthen the effect of cognitive social capital on collaboration. The results of the other moderation tests indicate that firm-size, age, gender-ratio of directors, ownership, geographic spread, culture, organization structure and previous experience strengthen the effect of social capital on strategic collaboration. The results of further analysis indicate that the structural social capital is influential for the corporate social responsibility of banking organizations. Both the inter-organizational collaboration and the corporate social responsibility yield higher financial performance at the firm-level. The study also provides evidence that the use of network measurements as the indicators of social capital provides better predictability in comparison to regular indicators.

These findings provide a valuable contribution to the theory of social capital, literature on ICT for development and and network theory, contributing to a more holistic perspective that incorporates social, technical and organizational aspects and provides insights useful for building effective strategies in similar developing contexts.

Chapter 1

INTRODCUTION

1.1 Background

As more and more companies understand what's at stake, they become a part of the solution, and share both in the challenges and opportunities presented by the climate crises. – Al Gore, An Inconvenient Truth (2006)

Collaboration is increasingly recognized as a key to the growth of emerging market economies. Over the years, many organizations have realised that collaboration is one of the best ways they can rapidly and effectively share knowledge, skills and resources to meet mutual objectives and provide new levels of value creation. Strong, lasting relationships can also help to resolve the business problems that occur every day, while regular communication with partners ensures robust, effective management of processes, and can even help to facilitate discussion on how to implement innovative changes to existing systems. Networking can be greatly supported by ICTs where instant and multiple channels of communication enable information and resource exchange, experience and opinion sharing, making it impossible for organizations to stand alone. Inter-organizational collaboration (IOC) may take many forms from market transactions to long-term partnerships such as joint ventures and alliances. However, healthy relationships do not randomly occur in business environments. Numerous barriers hamper the successful formation and maintenance of Inter-organizational relationships (IOR). There is an increasing need for tools and methodologies that can assist organizations to understand the ways in which they can build stronger and lasting relationships.

The concept of social capital builds around the value of connections. It can exist in many different forms such as trust, information and norms and has multiple dimensions. Social capital can provide a distinctive answer to the question of '*why and*

how some organizations do better in inter-organizational relations?'. According to Nahapiet (2008), "*social capital provides a valuable lens for understanding the formation and performance of IORs*". Being a relational concept that focuses on connections between actors, social capital enables integrating different facets of inter-organizational relations, including both the structure and the quality of their ties. Social capital can also be applied across different levels of analysis, from an individual person to an organization. Therefore, it is a valuable way to characterize an organization's complete set of relations, including those that span institutional boundaries (Koka and Prescott 2002). Therefore, social capital is an increasingly important perspective for the study of inter-organizational relations.

This study focuses on how the multiple dimensions of social capital and ICT capabilities of organizations drive the formation of successful inter-organizational partnerships and collective actions. In this study, social capital is viewed as a resource available to an organization via its external connections. The organizations are examined in terms of their capabilities in relation to external networking. The following sections of this chapter will explain the rationale, objectives, approach and significance of this research study.

1.2 Rationale

1.2.1 Literature-based Motivations

> "*A central challenge in the study of inter-organizational relationships (IORs) is to explain why and how organizations connect effectively, work cooperatively, and coordinate their activities to achieve superior performance*" (Nahapiet 2008).

There are several reasons for undertaking this research. The lack of theoretical and empirical understanding on the role of social capital in inter-organizational setting is the primary motivation for undertaking this research. In the domain of IOR, Gulati (1995) emphasized the importance of social networks in inter-organizational alliance formation. After Nehapiet and Goshal (1997) identified the structural, relational and cognitive dimensions of social capital, Tsai and Goshal (1998) provided empirical evidence on how the three dimensions of social capital affect inter-unit resource

exchanges and combination and suggested that future research should study the role of multiple dimensions of social capital and inter-organizational strategic alliances. Reviewing the role of social capital in IORs, Nehapiet (2008) identified social capital as an especially useful tool to explain why some organizations do better in IORs than other organizations. However, the three dimensions of social capital supports inter-organizational collaboration has not been adequately investigated to date. Even though there is a substantial body of literature investigating the beneficial outcomes of social capital, they tend to focus on individual, group or team level. Out of the studies that did focus on social capital and IOR, the mainstream literature is based on evidence from developed countries. There is much to learn in this regard. While strategic alliances in the developing countries remain largely unexplored, alliances in the finance industry in developing contexts remain untouched in the literature.

Also, no literature has investigated how ICT and other factors influence the effect of social capital on inter-organizational collaboration. Nor has there been such an investigation in the context of developing countries, in Sri Lanka, or in the banking and finance industry, even though the banking and finance industry is potentially a strong force for economic development. A lack of research which compares different indicators and different analysis approaches on how different dimensions of social capital support inter-organizational collaboration is another motivation for this research. A large body of research has investigated social capital and its beneficial outcomes using one approach. We are yet to learn which approaches will provide better predictability over others.

To the best of author's knowledge, there is a gap in the literature of studies that holistically capture how the different dimensions of social capital drive inter-organizational collaborations incorporating external factors that strengthen or weaken the original effects. Furthermore, this domain is largely untapped in relation to developing contexts, particularly in the finance sector. '*Could social capital at the corporate level be used as a resource when forming inter-organizational partnerships*?' If so, *'which dimensions of social capital have greater impact in this regard?*' and '*what technology and other factors should be in place to strengthen the effect of social capital*?' Such questions, therefore, remain unanswered.

This study investigates the impact of Social Capital (SC) on the Inter-Organizational Relationships (IORs) focusing on the inter-bank domain in Sri Lanka. This choice of finance domain is motivated through the evidence in literature that social relations play a significant role in the finance domain. Growiec at el. (2012) examined social capital in Iceland, (in terms of social ties, social trust, political activity and civic engagement), before and after the financial crisis of 2008 and identified that social capital has become more important in a variety of ways, from a strengthening of or greater reliance upon social relationships to heightened civic and political engagement.

Other studies in the financial domain have found that the quality of the credit supply is greater where social capital is higher, given that the latter positively affects cooperation in credit markets by reducing the free-ride phenomenon (Albertazzi and Marchetti 2010, Catturani and Venkat 2014). Alesina et al. (2013) consider social capital across different provinces in Italy and find that interest rates are lower where social capital is higher. In a study of U.S. investment banks, Chung at el. (2000) identified that banks' resource complementarity, status similarity and social capital in terms of prior alliances and reciprocity in opportunity exchange are important factors in alliances formation. Evidence from the recent financial crisis suggests that banks underperform when connected board members are involved in the appointment of executives (Hau and Thum 2009). Berger at el. (2013) argues that despite the recommendation of the Basel Committee on Banking Supervision (Basel-Committee 2006) that directors are 'independent', some individuals form interpersonal relationships and they can affect economic outcomes and career development. Consequently, a study on the effect of social capital in terms of bank executives' social networks, trust and shared understandings seems warranted.

1.2.2 Contextual Motivations

To derive empirical evidence on social capital's effect on inter-organizational relationships, this study focuses on the inter-bank domain in the Sri Lankan banking sector. This focus was influenced by several contextual factors.

Developing Contexts

There are many long standing contextual factors that challenge developing economies. While a country's supply of natural resources is an important source of economic development, the ability to efficiently manage the available resources also matters. In the globalized economy, an organization's value creation is not decided just by the internal capability but also by the external linkages. While the emerging market organizations are generally challenged by the lack of resources in terms of finances, infrastructure, technology, human resources, skills, knowledge, the contextual challenges also create highly volatile grounds demanding organizations to be more agile in order to survive. Consequently, organizations increasingly seek ways to minimize risks and to create value while ensuring the stability of the larger collective. The ability to collaborate well is an important competence for organizations in this setting. Inter-organizational collaborations, incorporating capabilities existing outside the organization, therefore can open doors to a huge potential for growth. With the right governance framework, such collaborations can have a great impact over economic development through resource and knowledge sharing, mitigating risks, reducing costs to develop and to market, broadening the innovation pipeline and improving time to develop and time to market considerably. Such collaboration can trigger an increasing pace of innovation at substantially low costs in business models, products or services and processes.

Sri Lanka

Sri Lanka provides a promising platform to study the aspects of social capital. Sri Lanka is a democratic republic which is governed by a semi-presidential and a parliamentary system (*https://www.gov.lk/index.php*). A diverse and multicultural country, Sri Lanka is home to many religions, ethnic groups, and languages (Roth 1998). According to 2016 statistics, Sri lanka has a population of 21,203,000 (DCS). Sri Lanka has a highly cohesive local culture. The Legatum rankings placed the country in the 32nd and 19th places in the social capital sub index consecutively in 2015 and 2016 (Institute 2015). This is an indication of a local culture rich in social capital providing fertile grounds for the study of social capital. On the other hand, drawing empirical evidence from Sri Lanka would enable better understanding of social capital

theory within non-Western contexts which can help to test the generalizability of the existing theories that are largely Western-born.

After concluding a long period of terrorism and civil war which caused significant hardships for the population, environment and economy from 1983 to 2009, Sri Lanka is experiencing a massive tide of economic development joined with rapid infrastructure developments and investments, naturally leading to a significant escalation in capital requirements. The country depends heavily on financial services extended by banking organizations for these major development and investment projects.

The financial system in Sri Lanka comprises the major financial institutions, such as the Central Bank of Sri Lanka (CBSL), 26 Licensed Commercial Banks (LCBs), 9 Licensed Specialised Banks (LSBs) and 47 Licensed Finance Companies (LFCs). The banking sector dominates the financial system and accounted for 58 per cent of the total assets of the financial system as at the end of 2014. Among the 34 banking organizations, there are state owned organizations, foreign organizations and local privately owned organizations. While many of the other finance organizations are not comparable to the banks in terms of financial assets, the individual banking organizations lack monetory resources to cater to the high demands of developmental and investment plans. Due to capital constraints and high risks associated with lending large sums, banks rely more on collaborative arrangements. Alliances such as in the form of loan syndications, project financing and equity capital markets help fill such demands by drawing resources from the local and international network and expertise. Such inter-organizational relationships draw special attention to partner selection, assessment of risk and collective decision making. This timely need calls for identifying ways in which the rapid developmental needs can be fulfilled with the limited availability of resources and the collaborative strategies address this momentum. While inter-bank collaboration may benefit infrastructure development and new investments supporting economic development, it may also benefit individual organizations in terms such as increased performance, mitigating of risks of lending very large sums and acquisition of knowledge in lending to new domains. Long-term

healthy partnerships between banking organizations may also ensure economic stability and sustainability across industries.

1.3 Aims and Research Questions

Social capital can be translated into real business advantages contributing to the individual organizations as well as the economy. Social capital, in terms of external network relationships plays an important role in the formation of inter-organizational strategic relationships and performance of organizations. The resources embedded in the external personal network of the firm are expected to be able to bring down the barriers to successful formation of partnerships such as trust, communication, accessibility and information. Drawing upon social capital theory, network theory, and literature, inter-organizational relationships and ICT for development, this study develops a conceptual model that explores the relationship between external network resources and the successful formation of long term partnerships.

The primary aim of this research is to **develop and test a model explaining the relationship between social capital and inter-bank collaboration**. The dissertation has the following sub-objectives:

i. To identify indicators of structural, relational and cognitive social capital that influence inter-bank collaboration in Sri Lanka.
ii. To identify other factors that strengthen or weaken the influence of social capital on inter-bank collaboration.
iii. To identify how network approaches could be used to analyse the aspects of social capital dimensions to better predict collaboration in the Sri Lankan banking industry.

To fulfil the aim of this research, a primary research question is formulated as '**what components and relationships are needed in a model of social capital and inter-bank collaboration in the Sri Lankan context?**'. To facilitate answering the primary research question, several subsidiary research questions are formulated as follows:

i. What are the key aspects of the structural, relational and cognitive dimensions of social capital that influence inter-organizational collaboration in the Sri Lankan banking sector?
ii. What other factors strengthen or weaken the influence of social capital on inter-organizational collaboration?
iii. How can network science approaches be used to analyse the aspects of social capital dimensions to better predict inter-organizational collaboration in the Sri Lankan banking sector?

1.4 Approach

The primary aim of this research is to develop a model of how ICT enabled social capital affects inter-bank collaboration. The purpose of this research is to investigate how the multiple dimensions of social capital influence the inter-organizational collaboration, thereby increasing corporate social responsibility (CSR) and performance of organizations.

To fulfil the aim of this study, a quantitative approach combined with network measurements is adopted. A quantitative research strategy enables evaluating specific hypotheses to answer the research questions (Neuman 2007, Creswell, Klassen et al. 2011). In particular, a quantitative strategy is useful for examining how well-defined hypotheses are supported by numeric data representing viewpoints of a population (Creswell, Klassen et al. 2011). A quantitative research strategy is considered suitable for this research over other research strategies. A quantitative approach supports obtaining results that could be generalized to a large population and for drawing strong inferences from data through statistical analysis (Steckler, McLeroy et al. 1992, Creswell 2009). It is also considered less time consuming compared to in-depth data collection methods used for qualitative studies, in particular, in collecting perceptions across a large number of organizations (Weber, Festing et al. 2013).

This research follows six main phases. The research is initiated with the formulation of research questions and moves on to a comprehensive review of literature in search of aspects of social capital that may have an impact on the inter-organizational

collaboration and what technology factors may cause strengthening or weakening effects. A pilot study was employed with two banks in order to identify the perspectives of bankers on the proposed concept to augment the findings from the literature. A survey was developed and carried out manually as well as in online form. Such an understanding led to the development of a conceptual model and hypotheses. A research instrument was developed and data was collected through a survey and public sources.

Based on the relational data collected, social networks between organizations were developed and the locational properties of individual organizations were identified using a network analysis tool. The statistical analysis methods were applied to identify the correlations between constructs. Both the network measures and original data were used to validate the proposed conceptual model using structural equation modelling (SEM) techniques (Byrne 2010). In addition, dyadic level analysis was performed to identify underlying social mechanisms of inter-organizational partnerships. Moderation effects of various ICT aspects have been analysed. Finally, the results have been interpreted to draw specific conclusions to adequately answer the research questions.

1.5 Significance

The findings of this study contribute to theory and practice. This research contributes mainly to the theory of social capital and provide empirical evidence supporting a model of how multiple dimensions of social capital together with enablers and inhibitors affect collaboration within the banking industry, providing insights for development of effective strategies. This provides new knowledge in multiple theoretical domains, such as social capital, ICT for development, CSR and Inter-organizational relations, contributing to a more holistic perspective that incorporates social, technical and organizational aspects for a wide audience of researchers in the future. The identified predictive power of network measurements will also contribute to network theory and will provide a foundation for future researchers of network science in various contexts and the building of subsequent theory. The identification of enablers and inhibitors to collaboration through the lens of social capital in the Sri

Lankan banking industry will add to the body of knowledge and may provide a baseline for similar studies in other developing countries.

While the research is undertaken in the context of the banking industry in Sri Lanka, the study may have significant implications for banking organizations, government policy-makers and future researchers elsewhere. The Sri Lankan Government and regulatory bodies can harness the new knowledge to create effective policies and regulations for a collaborative and sustainable finance sector, which in turn affects the economy as a whole. The financial authorities in similar emerging markets will also gain value from the findings, providing the opportunity to analyse the applicability of the identified mechanisms for their specific circumstances. It is hoped that this greater understanding of success in relation to inter-organizational collaboration may increase the chances of survival for smaller organizations while enhancing sustainability of the finance industry as a whole.

This study will also contribute to the timely developmental needs of the country in which the study is conducted. In the post-war development era, Sri Lanka is striving to rise to a middle-income country regardless of the numerous challenges posed by poverty and the lack of resources. The banking sector in Sri Lanka serves as the backbone of this massive economic expansion, while a majority of the banks lack adequate monetary and other resources to face the heightened challenges and rising demands of large developmental projects and investments. Collaborative strategies, therefore are viewed as more attractive solutions that strengthen the financial backbone of the country. The importance of collaboration is stronger in the banking industry, also due to the high risks of lending to unknown domains. This timely need has created a promising platform for this research and the findings could be directly applied through reforming strategies and policies to recognize the effect of social capital on collaboration, which in turn enables sustainable development. Social capital may provide an effective, sustainable and stronger basis for inter-bank relationships with strong security in their quest to satisfy challenging demands of customers.

1.6 Outline of the Thesis

Chapter 1 of this thesis provides an **introduction** to the research. The chapter presents a brief description of the background of the research, the rationale for the research, the research aims, and the research methodology used to meet the research objectives.

Chapter 2 provides a comprehensive review of the **literature** relevant to this research, starting from social capital. Inter-organizational relations, ICTs, corporate social responsibility and network science. Finally, the relevant gaps in the literature are highlighted.

Chapter 3 of this thesis harnessess the specific literature relevant to the **development of the conceptual model**. The theoretical constructs, indicator variables related to each construct and the proposed hypotheses are discussed in this chapter.

Chapter 4 explains the research **methodology** used in this research. An overview of the research strategy is explained. The development of the survey instrument, the process of data collection, the steps taken to enhance the reliability and the validity are explained. Also, a description of steps and criteria used in SEM is presented here.

Chapter 5 details the process of **preliminary data analysis** including data screening, descriptive statistics of data, and tests for common method bias. This stage is used to prepare the dataset into a form suitable for the analysis.

Chapter 6. presents the PLS-SEM **analysis** carried out in this study with the estimated **results and interpretations** of findings. It also examines alternative analysis methods, moderation effects of selected external factors and extensions to the initial model.

Chapter 7 provides the **Conclusion** of the research, including a summary of the research findings, implications, contributions, limitations and future work.

Chapter 2

LITERATURE REVIEW

2.1 Introduction

Inter-organizational collaboration and financial intermediation is a critical determinant of performance in emerging economies. In pursuit of acquiring a better understanding with empirical evidence for why and how some organizations do better in inter-organizational relations, this study investigates multiple streams of literature and aims to develop a model of how multiple dimensions of social capital, ICT and other firm-level factors drive inter-bank strategic collaboration in the banking sector in Sri Lanka. In addition, the study investigates how social capital drive CSR of banking organizations.

This chapter presents the review of literature on (1) Social Capital - SC (2) Inter-Organizational Relationships - IORs (3) ICTs for Development and (4) relevant concepts of network science. The chapter begins with an overview of social capital including its foundations, forms, and effects. Then it presents a review of literature on inter-organizational relationships and summarizes the literature providing theoretical and empirical evidence on the connection between social capital and IORs. Subsequently, a discussion of literature on the link between ICTs and social capital is presented emphasising the enabling role of ICT. Moreover, the available literature on the relationship between social capital and CSR is summarized. The complementary relationship between social capital studies and network science is then discussed summarizing a range of network measures and approaches used for this research. Finally, the research gap explored in this study is defined.

2.2 Social Capital (SC)

"*It takes a village to raise a child"* - African pro-verb.

Social scientists and practitioners have long recognised the importance of social relationships in organising and mobilising individuals and communities, and contributing to the success of organizations and community initiatives. 'Social Capital' refers to the resources, knowledge, and information that accrue to an individual or a collective as a result of the network of social relationships within and between institutions, and communities. While social capital is usually studied at the individual level, it can also be viewed at higher levels such as group or organizations where the aggregates of ties may operate among the social units. At the micro (individual) level, social capital can be observed through the benefits such as information, resources or opportunities that are available to an individual through his or her connections with others, which is otherwise not available him. This is evident through day to day social situations such as when people get better chances through friends in influential positions or receive help from close family and friends during hardships.

In recent decades, the concept of social capital has become one of the most popular topics in the social sciences, and in disciplines such as business, information systems, sociology, economics, geography, political science, education, development studies, and public health (Coleman 1988, Fukuyama 1995, Putnam 1995, Nahapiet and Ghoshal 1998, Leana and Pil 2006, Acquaah 2007, Lee and Kim 2013).

2.2.1 Theoretical Foundations

The origin of social capital can be traced back to the '**Social Exchange Theory'**. The simple observation that many forms of social interaction can be conceptualized as an exchange of benefits gave rise to this substantial body of work (Simmel 1907, Homans 1958, Gouldner 1960, Blau 1964). "*People depend on one another for valued resources, and they provide them to each other through the process of exchange"* (Molm, Peterson et al. 2001: 260). Social exchange theory provides many of the central ideas in social capital studies, including exchange structures and

exchange processes. It is foundational for much work in IOR (See E.g Larson 1992, Molm, Peterson et al. 2001, Das and Teng 2002).

'Appropriability' and '**Reciprocity'** are two features of exchange that are particularly important for understanding how social capital works. Appropriability is the idea that social connections of one type often can be used for different purposes (Coleman 1988, Adler and Kwon 2002). For example, friends, or even the friends of friends, may provide timely information about job opportunities. Colleagues met in one situation may prove to be valuable contacts in other spheres of life. In the context of IOR, Uzzi (1996) describes the initial stock of trust that can be appropriated from existing social relations and built upon in other settings. Reciprocity, the expectation that exchange will be mutual, is a principle established early in exchange theory (Gouldner 1960) and evident in much research in IOR (Powell, Koput et al. 1996, Uzzi 1997). It is central to Putnam's work on social capital. Generalized reciprocity is described by Putnam (1993) as the principle that operates when a person does something of value for another without expecting anything immediately in return and perhaps without even knowing them, "*in the expectation that, down the road you or someone else will return the favour*" (1993: 37; see also Gouldner 1960). He argues that a society that relies on generalized reciprocity is more efficient, more trustful, and more open to collaboration. Baker (2000) perceives reciprocity as a powerful principle under pinning social exchange across a wide range of social contexts, from international relations to the help offered by individuals to each other within an organization and including IORs. It is this principle which creates the possibility to move exchange from a world of primarily short-term, individualistic, and instrumental actions to a more social and enduring basis for exchange relations.

It is evident that scholars of social capital seek to focus on the value of social connections by describing them as '**Capital**'. Scholars recently added the term social capital to draw attention to the resources located in social networks and the potential returns on investments in social relations (Bourdieu 1986, Coleman 1988). There are several ways in which social capital resembles classical views of capital (such as. human capital, physical capital) in that it is built over time, appropriable and convertible. It can also act as a substitute for or a complement to other forms of capital.

2.2.2 Forms and Definitions

Social capital has been given a variety of definitions in the literature due to its context specific nature and the complexity of its operationalization. While these definitions are broadly similar, they also express some distinctions. Because of this divergence, there are many challenges to the further refinement of social capital research. This study does not attempt to resolve the debates, but through exposing how social capital is defined in IOR studies, some light could be shed on how social capital is quantified, how empirical studies are answering or avoiding the questions posed above, and what actions could be taken in future research.

2.2.2.1 Individual vs Collective Social Capital

Despite a general agreement on the importance of social capital, the debate of '*whether social capital is a private good or public good'* is evident in the literature. Studies of social Capital can be roughly divided into two groups: individual social capital, and collective social capital (Portes 2000).

Bourdieu (1985), Coleman (1988), and the scholars who follow them, regard social capital primarily as the resources derived by an individual from his social network. Social capital defined from this point of view is called '**Individual social capital**' (Portes 2000). Fukuyama (2002) suggested that social capital is not a public good but a private good that produces extensive positive and negative externalities. Most work adopting social capital and structural network theory perspectives views social capital as an asset for the individual actor. Burt's (1992) approach to social capital emphasises on the structural features of networks as an important aspect of social capital. Network approaches constitute one of the most important streams of research on the role of social capital in IORs (See e.g. Baker 1990, Powell, Koput et al. 1996, Uzzi 1996, Uzzi 1997, Gulati, Nohria et al. 2000, Zaheer and Bell 2005).

In contrast, the school of '**Collective social capital**' was pioneered by Putnam (1993) and Woolcock and Narayan (2000). They generally considered social capital as a community resource which includes both individuals' social networks and their attitudes, or norms that contribute to the common good of a community. This line of

research that draws on the concepts of community and culture emphasizes a different logic of action more oriented to mutual support and collective engagement (DiMaggio 1994, Adler and Heckscher 2006). According to Newton (2001), social capital and civil society are essentially social and collective property of social systems, not a characteristic of individuals . As such, it can be a powerful enabler of inter-organizational entities (IOEs) (Morgan and Cooke 1998). Biggart and Delbridge (2004) described as communal exchange based on social solidarity, shared identity, and bonds. In organizational terms, it resembles the **'clan'** form of governance outlined by Ouchi (1980) and **'collaborative community'** recently described by Adler and Heckscher (2006). IOR research showing the importance of professional ties and connections as the foundation for successful exchange is representative of this line of inquiry (Bouty 2000, Ferlie, Fitzgerald et al. 2005).

2.2.2.2 Internal vs External Social Capital

Social capital studies also vary depending on whether their focus is primarily on (1) the relations an actor (an individual or a group) maintains with other actors, or (2) the structure of relations among actors within a collectivity, or (3) both types of linkages (Adler and Kwon 2002). A focus on external relations foregrounds what has been called '**bridging**' social capital, whereas a focus on internal ties within collectivities foregrounds '**bonding**' social capital (See Gittell and Vidal 1998, Putnam 2000). Table 2.1 presents a summary of various definitions found in literature for social capital.

In the '**Internal'** view, the social capital of a collectivity (a firm) is found in its internal structural features that give the collectivity cohesiveness, facilitating pursuit of collective goals. Internal social capital comes from social network connections among individuals in an organization (e.g. employees in a company), a community (e.g. members of a neighbourhood) or a system (e.g. members of an association) (Adler and Kwon 2002, Leana and Pil 2006, Acquaah 2011). Bonding social capital refers to horizontal, tightly cohesive ties between individuals sharing similar demographic characteristics. It is characterised by homogeneous networks (e.g. attending the same church or institution). This approach is reflected in the socio-centric (Sandefur and Laumann 1998) and much of the 'whole- network' (Wellman and Berkowitz 1988: 26) variants of network sociology (For example see Lin (2001); Marsden (2002)).

Table 2.1 : Definitions of Social Capital

Category	Definition	Authors
External	"the aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance or recognition".	Bourdieu (1985: 248)
	"made up of social obligations ('connections'), which is convertible, in certain conditions, into economic capital and may be institutionalized in the form of a title of nobility"	Bourdieu (1985: 243)
	"a resource that actors derive from specific social structures and then use to pursue their interests; it is created by changes in the relationship among actors"	Baker (1990: 619).
	"friends, colleagues, and more general contacts through whom you receive opportunities to use your financial and human capital"	Burt (1992: 9).
	"the ability of actors to secure benefits by virtue of membership in social networks or other social structures"	Portes (1998: 6).
Internal	"Social capital is defined by its function. It is not a single entity, but a variety of different entities having two characteristics in common: They all consist of some aspect of social structure, and they facilitate certain actions of individuals who are within the structure"	Coleman (1990: 302)
	"the ability of people to work together for common purposes in groups and organizations".	Fukuyama (1995: 10)
	"Social capital can be defined simply as the existence of a certain set of informal values or norms shared among members of a group that permit cooperation among them".	Fukuyama (1997)
	"features of social organization such as networks, norms, and social trust that facilitate coordination and cooperation for mutual benefit".	Putnam (1995: 67)
Both	"the sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit. Social capital thus comprises both the network and the assets that may be mobilized through that network".	Nahapiet & Ghoshal (1998: 243)
	"the information, trust, and norms of reciprocity inhering in one's social networks".	Woolcock (1998: 153)

In contrast, the '**external'** (bridging social capital) view, focuses primarily on social capital as a resource that inheres in the social network tying a focal actor to other actors. On this view, social capital can help explain the differential success of individuals or organizations in their competitive rivalry: the actions of individuals and groups can be greatly facilitated by their direct and indirect links to other actors in social networks. Bridging social capital, on the other hand, refers to ties that cut across different individuals and communities. This type of social capital is based on heterogeneous and outward-looking connections with individuals from different social groups (e.g. relationship between managers in two organizations) (Ferlander 2007). Social capital research in sociology (e.g. Burt 1992, Burt, Nohria et al. 1992) has been strongly influenced by network theorists, and this view of social capital is reflected in the ego-centric variant of network analysis. Accordingly, the external social capital, derives from the social network structures and connections between an actor and its important external stakeholders (e.g. an organization's relationship with its customers, suppliers, competitors.)

Table 2.2 : Forms of Ties (bonding, bridging, linking)

Level of Strength and Diversity	Strong Ties	Weak Ties
Bonding (horizontal) ties	Close friends or immediate family with similar social characteristics, e.g. social class or religion	Members with similar interests or social characteristics within voluntary associations
Bridging (horizontal) ties	Close friends or immediate family with different social characteristics, e.g. age, gender or ethnicity	Acquaintances and members with different social characteristics within voluntary associations
Linking (Vertical) ties	Close work colleagues with different hierarchical position	Distant colleagues with different hierarchical positions and ties between citizens and civil servants

A branch of bridging social capital that considered the formality of the ties (formal and informal) is named '**Linking Social capital**'. It refers to vertical ties that span different power relationships, linking individuals across different vertical social layers (e.g. relationships between the subordinate employees and the top executives in a firm)

(Woolcock 2001). Linking social capital is commonly associated with external connections and ties rather than internal ties. Examples of bonding, bridging and linking social capital with strong and weak ties are shown in the table 2.2, while examples of formal and informal ties are presented in the table 2.3.

Table 2.3 : Formal and Informal Ties: (Source: Ferlander (2007))

Level of Formality and Direction	Formal Ties	Informal Ties
Horizontal ties	Voluntary associations	Family, relatives, friends, neighbours and colleagues
Vertical ties	The church, work hierarchies and network ties between citizens and civil servants	Criminal networks, clan relations and street gangs

A third group of definitions is worded so as to be **neutral** on this internal/external view due to several reasons. First, the distinction between the external and internal views is a matter of perspective and unit of analysis. (e.g. the relations between an employee and colleagues withinan organizationare external to the employee but internal to the firm.). The internal and external views are not mutually exclusive. The behaviour of a collective actor such asan organizationis influenced both by its external linkages and by its internal linkages: its capacity for effective action is typically a function of both.

Other Perspectives: Some definitional preferences are also based on disciplinary areas of interest Acquaah et. al. (2014). Corporate disciplines usually prefer the definitions provided by Alder and Kwon (2002) and Nahapiet and Ghoshal (1997). Adler and Kwon (2002) define social capital broadly as "*the goodwill available to individuals or groups that is derived from the structure and content of an actor's social relations*", while Nahapiet and Ghoshal (1997 : 243) define social capital as "*the sum of actual and potential resources embedded within, available through, and derived from the network of relationships possessed by individuals or social units*". These definitions borrow from both 'individual' and 'collective' views. In order to embrace the divergent definitions of social capital, the multi-dimensional definition proposed by Nahapiet and Ghoshal is a useful tool.

2.2.2.3 Dimensions of Social Capital

According to Nahapiet and Ghoshal (1998), Social capital comprises both the network and the assets that may be mobilized through that network. This definition allows social capital to include both individual and collective properties. There is also a general consensus that both internal and external social capital can be classified in three dimensions – structural, relational, and cognitive. Therefore, this study intends to adopt this definition. It presents a distinction between three dimensions: structural, relational and cognitive, and discuss the highly-interrelated nature of the features they present.

a) Structural Dimension

The structural dimension comprises the actual links between actors in the network that provide the opportunity for accessing resources or acting together. It refers to the observable interactions or links of people (Harpham 2008). Thus, it captures not only whom you reach, but also how you reach them, and how frequently you share resources and information (Nahapiet and Ghoshal 1998). In other words, it focuses on the properties of the network of relations as a whole.

Literature provide evidence of indicators for structural social capital in several levels. Commonly identified important facets of structural dimension are: the presence or absence of network ties between actors (Wasserman and Faust 1994, Nahapiet and Ghoshal 1998), and network configuration (Krackhardt 1994). Overall pattern of linkages between actors (Burt 2002) such as density, connectivity, hierarchy, closure and holes have been considered. The existence of the networks created for one purpose may be used for another referred to as '**network appropriability**' (Coleman 1988, Bolino, Turnley et al. 2002). Also the locational properties of individual nodes in the network such as centrality and betweenness have been considered as measurements of structural dimension (Gnyawali and Madhavan 2001). The position in the network can have a significant impact on firm performance and is an important source of competitive advantage (Gnyawali and Madhavan 2001, Heck and Vervest 2007). Some positions are more beneficial than other positions(van Liere 2007).

Supported by the significant work of Burt (1992, 2000, 2005), structural perspectives, contribute several key concepts. One of the popular topic of researchers in this domain is the distinction between bridging and bonding ties, the former focusing on the external connections of actors, the latter on the stronger, multiplex ties within groups. Burt repeatedly emphasised on the value of bridging ties, showing that brokers do better as a result of the improved vision and creativity that comes from the increased variety to which they are exposed. Brokers typically have networks characterized by structural holes, i.e. gaps between different clusters of actors which could be viewed as an opportunity to bridge into a new territory. On the other hand, 'network closure' typically decreases variation in a group, reinforcing the status quo. Both 'bridging' (Burt 2002) and 'closure' (Coleman 1988) have often been linked to the improvement of firm performance. In general, structural social capital facilitates mutually beneficial collective action through established roles and social networks supplemented by rules, procedures and precedents (Hitt, Lee et al. 2002).

b) Relational Dimension

Relational social capital focuses on the quality of the links and the resources that are created or leveraged through these links. Among the key facets of this dimension are trust and trustworthiness(Putnam 1993, Fukuyama 1999), norms and sanctions (Coleman 1988, Putnam 1993), obligations and expectations (Granovetter 1983, Coleman 1988, Burt 1997) and identity and identification (Håkansson and Snehota 1995). In general, the relational aspects are developed through a history of interactions between parties (Granovetter 1992). The affective qualities routed in the links, provide motivation to act more collaboratively toward others (Yang, Lee et al. 2009).

Seppänen, et al (2007) suggested that trust is a multi-dimensional, reciprocal and context-specific concept after reviewing a number of empirical studies on inter-organizational trust and identified some common indicators of trust between two parties as competence, reliability, predictability, contractual trust, lack of dependence and information sharing. Trust is the expectation that arises within a community of regular, honest and cooperative behaviour, based on commonly shared norms, on the part of other members of that community. In the case of high levels of trust, the expectations that others will reciprocate are high and people tend to follow the civic

norms (Knack and Keefer 1997). Norms can be based on what is deeply valued in a community, such as the nature of God or justice, but they also encompass nonspiritual norms such as professional standards and codes of behaviour (Fukuyama 1995). The concept of 'Institution-based trust' reflects the belief that the necessary impersonal structures are in place to enable one to act in anticipation of a successful future endeavour (Zucker 1986). IN other words, it implies the security one feels about a situation because of guarantees, or other impersonal structures (Zucker 1986). Individuals make trust choices based on rationally derived costs and benefits (Williamson 1993).

c) Cognitive Dimension

The cognitive dimension involves the means by which the interactions between actors are enabled or the ability of people to act together. It represents the benefits of having common goals, shared vision, and shared representations, interpretations, and systems of meaning among parties. In other words, cognitive social capital refers the values and perceptions shared by people (Harpham 2008: 51). Nahapiet and Ghoshal (1998) used shared code, shared language and shared narratives as indicators of cognitive dimension. Cognitive social capital, which includes shared norms, values, attitudes, and beliefs, incline people towards mutually beneficial collective action (Krishna and Uphoff 2002). Shared vision and goals and collective values, help promote collective action (Leana and Pil 2006). Norms can be viewed as a social contract or unwritten rules. One important norm is reciprocity (Fountain 1997) in which people act for benefit of others and expect to get help in return when it is needed. Cognitive and structural forms of social capital are commonly connected and mutually reinforcing (Uphoff and Wijayaratna 2000).

Since Nehapiet and Ghoshal (1997) theoretically justified the three dimensions if social capital with emphasis on the interrelated nature, studying the interaction between the three dimensions and their facets became an important theme within the social capital literature. Several empirical studies attempted to identify the nature of these interrelations (Tsai and Ghoshal 1998, Zheng 2010, Camps and Marques 2014, Roden and Lawson 2014, Bstieler, Hemmert et al. 2015). While Structural dimension

is found to be an antecedent for the relational dimension (Tsai and Ghoshal 1998, Bstieler and Hemmert 2015), both structural and cognitive dimensions influence the development of relational capital (Roden and Lawson 2014). However, Bstieler et. al. (2015) show an interdependency between structural dimension and relational capital, but the cognitive capital was moderating this effect.

2.2.3 Measurement

Social capital is a multifarious concept that is not likely to be represented by any single measure. The abstract nature of social capital and the lack of agreement on its definition poses a challenge towards formation of a universal means of measurement (Moses Acquaah 2014). Social capital has components that are inherently abstract and require subjective interpretation in their translation into operational measures that are usually indirect surrogates of the relevant components (Narayan and Cassidy 2001). Cavaye (2004) believes that there are no best indicators, rather key characteristics that guide the choice of indicators such as: specificity of the variable, measurability (ease of measurement), comprehensiveness (measures of a range of social characteristics), reliability and rigor, ability to translate across situations and be consistent in local state or national frameworks.

Measurement of social capital depends in part on the way in which it is defined, conceptualized and applied to social phenomena (Moses Acquaah 2014). The approaches used to measure social capital also depend on the disciplinary focus of the measurement (e.g. economics, sociology, management, health, etc.), the dimensions of social capital (structural, relational, and cognitive), and the level of analysis (individual, group and organizational, community and national). Measurement of social capital also varies depending on the interests of researchers and "*whether they focus on the substance, the sources, or the effects of social capital*" (Adler and Kwon 2002: 19). Social capital has been described and measured with so many items such that many researchers have argued for the separation of items that indicate the sources or determinants from those that represent outcomes. Woolcock (1998) stated that social capital should be identified by its source or determinants (e.g. social ties) rather than its effects or outcomes (e.g. resources). Laursen et al. (2007) noted that there are

several problems in measuring social capital because of the lack of clear distinctions between the sources and the consequences of social capital. For example, Narayan and Cassidy (2001) argue that some of the proxies that have been used to measure social capital such as political engagement, safety and security, and social cohesion are actually outcomes of social capital.

There are also differences in the measurements of individual and collective social capital. The measurement of individual social capital usually focuses on variables indicating the network position of an individual inside a social network (Adam and Urquhart 2009). Some of the measurement instruments include the Name Generator, the Position Generator, and the Resource Generator (Van der Gaag and Snijders 2004, Van Der Gaag and Snijders 2005, Van der Gaag, Snijders et al. 2008). Collective social capital requires multi-dimensional measurements (Grootaert 2003). Stone (2001, p.6) posited that "*by linking social capital measurement directly to theoretical understandings of the concept, we are able to: first, recognize that social capital is a multi-dimensional concept comprising social networks, norms of trust, and norms of reciprocity; second, understand social capital properly as a resource to action; and third, empirically distinguish between social capital and its outcomes*" and this provides a sound basis for developing a measurement framework relating the indicators to the theoretical understanding.

Among the most widely agreed dimensions of social capital in the literature are social networks, trust, and norms of reciprocity. In general, measures of the structural dimension of social capital have emphasised the pattern of the connections between an individual and his or her network of acquaintances, while measures of the relational dimension emphasise the nature and quality of the interactions and relationships among individuals and the measures of the cognitive dimension focus on shared representations, goals, norms, values and reciprocity. The indicators used to measure social capital at the organization level are similar to those used at the individual level. However, the emphasis here is on the role of firm-level social capital in developing inter-organizational relationships.

In empirical studies, quantitative measures of social capital have primarily been applied. Many researchers have relied on surveys and resulting social capital indexes developed by individual researchers, international organizations such as the World Bank and Organization for Economic Co-operation and Development, and think thanks such as the World Values Survey Association (www.worldvaluessurvey.org) for the purpose of measurement and comparison. Specific approaches to measuring social capital have ranged from simply using one indicator (e.g. social networks) to using complicated groups of indexes.

In the social capital literature, researchers tend to apply context specific indicators of social capital including trust (Cox and Caldwell, 2000), membership (Warde, Tampubolon et al. 2003), membership and trust (Veenstra 2002), membership, trust and norms of reciprocity (Isham, Kelly et al. 2002), and network resources (Zhao 2002). The relative suitability of these studies depends on the local context under which the indicators were applied. Several frameworks have been presented in the literature to measure social capital aspects in community level. (Spellerberg 2001, Stone 2001, Stone and Hughes 2002, Harper and Kelly 2003, Wilson 2006). Zeller et al. (2003) proposed a framework for measuring social performance of micro-finance institutions including social capital and political capital as one aspect of their framework. However, such measures do not take into account the multi-dimensional nature of social capital and the inherent source, form and consequence problems. Also, they cannot be applied to an inter-bank context where the nature of interactions is unique. Stone (2001) posited that there are insufficient tools for empirical measurement available and further research is required.

The most widespread measurement instrument used to measure social capital is the Name Generator (McCallister and Fischer 1978). This method maps the ego-centered social network as a starting point for a subsequent social resource inventory. It can result in very detailed and informative social capital descriptions, both in terms of relationships and resources. Name generating items such as ‘with whom do you talk about personal matters’ stems from this approach, and has been widely used (e.g. in the American General Social Survey, see Marsden, (1987)). A measurement method focusing more on the presence of social resources than relationships in networks is the

Position Generator (Lin and Dumin 1986, Lin, Fu et al. 2001). This method measures access to certain occupations, that represent social resource collections based on job prestige, following Lin's theories of social resources and social capital (Lin 1999, Lin 2001, Lin 2002, Lin 2008). Another more resource-oriented social capital measurement instrument is the Resource Generator (Van Der Gaag and Snijders 2005, Van der Gaag and Webber 2008). This instrument asks about access to a fixed list of specific social resources, covering several domains of life. This instrument can be administered quickly, and has more possibilities for use in goal specific research.

2.2.4 Causes and Effects

In the social capital literature, the central proposition is that networks of relationships constitute a valuable resource for the conduct of social affairs. The value of social capital stems from the access to resources that it produces through an actor's social relationships. Generally, the value of social capital has been assessed based on its potential impact on individuals, organizations, communities, nations and regions.

It is important to understand who benefits from social capital. As discussed in previously, some researchers regard social capital as a resource for the individual, assessing the ways in which personal networks provide individual benefits and advantage (Burt 2000; Lin 2001). Others draw attention to the social capital of communities though still consider the benefits to be primarily individual. Coleman, views community ties are important, but discuss the benefits they yield to individuals, such as the ability to walk the streets at night without fear (Coleman 1990). However, for Putnam (1993, 1995) and Fukuyama (1995) views social capital as a resource for the community, a public good. These ideas draw attention to the ways in which the wider institutional context may affect the creation and operation of IORs (Saxenian 1994, Morgan and Cooke 1998).

In their comprehensive review of social capital values and measurements, Acquaah at el, (2014) proposed an integrative model that connects the indicators, outputs and value of social capital. They explain that it is necessary to distinguish between direct outputs of social capital such as; information sharing, access to new knowledge, access to

resources, increased communication, social cohesion and empowerment, and the ultimate impacts (value creation) of social capital such as; improved financial performance, increased market share, innovation, increased social responsibility and increased human capital.

2.2.4.1 Immediate Outcomes

The embedded resources in social networks enhance the outcomes of actions through information, influence, social credentials, and identity reinforcement (Sandefur and Laumann 1998, Lin 2001). The volumes and varieties of **information** an actor may receive depends on the number, structure, and composition of its contacts. Koka and Prescott (2002) identified that social capital yields three distinctly different kinds of information benefits to organizations in the form of information volume, information diversity, and information richness. Social contacts may provide relevant, timely, and trustworthy information, making it especially useful for activities such as job search, and early access to market opportunities (Burt, Nohria et al. 1992, Baker 2000, Burt 2005). "*Social capital is also an important shaper of **power and influence***" (Nehapiet 2007). The structure of relationships of an actor can provide considerable power to those occupying brokerage positions whilst constraining those located in closed networks (Burt 2000, 2005). Social capital may also act as "*a **credential** for an actor, indicating the actor's social standing through the likely resources and support available to him*" (Bourdieu 1986: 249). Such credentials has been particularly important for start-up businesses (Stuart, Hoang et al. 1999, Meeus, Oerlemans et al. 2001). Social relations also play a central role in creating and reinforcing **identity** and social solidarity. When there is mutual trust, commitment and mutual obligation through shared identity among actors, there exists a capacity for cooperative and collective action (Sandefur and Laumann 1998). Such sense of mutual identity may foster stronger connections between members of similar groups such as professional groups that span across organizational borders (Brown and Duguid 2001). Such aspects may be useful for understanding patterns of exchange in IORs (see e.g. Ferlie, Fitzgerald et al. 2005).

It is important to note that the impacts of different forms of social capital considerably varied. While the components of structural, relational and cognitive dimensions may

overlap, the impact of social capital is best assessed by looking at the impact of a specific dimension (Moses Acquaah 2014). Andrews (2010), explored the independent and combined effects of organizational social capital on the performance of over 100 organizations in the United Kingdom between 2002 and 2005, and identified that the cognitive and relational dimensions were positively related to performance, but the structural dimension was unrelated to education, social care, and housing outcomes. It is revealed that the bridging, and linking social capital improve the chances of having the right contacts for various purposes improving their ability to solve various problems (Ferlander 2007). For example, members of wide networks are identified to be well informed about health issues (Erickson 2003), promote healthier behaviours (Yip, Subramanian et al. 2007), and enable to control unhealthy behaviours, such as smoking and alcohol abuse (Subramanian, Kim et al. 2002). On the other hand, strong bonding ties can promote unhealthy norms of behaviour, such as tobacco and alcohol use, drug use, unhealthy dietary patterns, and damaging sexual practices (Berkman et al., 2000). Simultaneously, bonding ties tend to provide emotional support, mainly via psychological mechanisms (Berkman, Glass et al. 2000).

2.2.4.2 Economic Benefits of Social Capital

The concept of social capital has been proved to be a powerful factor explaining actors' relative success in organizational research. The impact of social capital on economic activities might be direct or indirect. A direct impact might be the impact on outcome variables such as household welfare, poverty reduction, health, access to services, or educational attainment (Acquaah at el, 2014). Social capital is known to influence career success (Burt 1993, Podolny and Baron 1997, Gabbay and Zuckerman 1998) and executive compensation (Belliveau, O'Reilly et al. 1996, Burt 1997). Social capital also helps workers find jobs (Granovetter 1973, Lin, Ensel et al. 1981, Lin and Dumin 1986). However, the impact of social capital might not occur directly but might be moderated or mediated by factors such as governments, cultures (organizational and national) and regions. For example, the value of social capital in the form of knowledge transfer within a company might be dependent on whether the company has a flat organizational structure or a very vertical structure (Andrews 2010).

Social capital can contribute to economic development at the firm-level through the accumulation of human capital through creating a richer pool of recruits for organizations (Fernandez, Castilla, & Moore, 2000), reduction in transaction costs (trust lead to less need for monitoring) or efficiencies result in from adherence to shared norms. Literature shows further evidence linking social capital to beneficial outcomes at the firm-level. Social capital facilitates interunit resource exchange and product innovation (Tsai and Ghoshal 1998, Zheng 2010, Camps and Marques 2014), the creation of intellectual capital (Hargadon and Sutton 1997, Nahapiet and Ghoshal 1998), reduced turnover rates (Krackhardt and Hanson 2001) reduced organizational dissolution rates (Pennings, Lee et al. 1998), entrepreneurship (Chung and Gibbons 1997) and the formation of start-up companies (Walker, Kogut et al. 1997). Social capital enables collaborative activities of organizations leading to lead to creation and diffusion of innovations (Chou 2006). It is also linked to knowledge sharing (Bstieler, Hemmert et al. 2015) and firm performance (Dyer and Singh 1998, Ahuja 2000) laying the foundations of competitive advantage. Social networks provide the basis for trust and cooperation, leading to knowledge transfer and higher organizational performance (Weber and Weber 2010).

There is also evidence that social relations play a beneficial role in financial services domain. The empirical literature on the impact of banking relationships on loan conditions is mixed. Some studies finding that loan interest rates are lower when relationships are stronger (Petersen and Rajan 1994, Berger and Udell 1995). Some of the theories predict that contract terms such as interest rate and collateral requirements become easier for organizations as a relationship matures (E.g.Boot and Thakor 1994, Petersen and Rajan 1994). Others find no effects on loan rates (Elsas and Krahnen 1998, Harhoff and Körting 1998, Machauer and Weber 2000) or even an increase in rates (Degryse and Van Cayseele 2000). In general, studies of measures of credit availability and collateral requirements have consistently found that banking relationships facilitate access to financing and relax collateral requirements (E.g. Petersen and Rajan 1994, Berger and Udell 1995, Cole 1998, Elsas and Krahnen 1998, Harhoff and Körting 1998, Machauer and Weber 2000). In a study of IOR Fang (2011) find that organizations with active alliance involvement experience a lower cost of debt from banks and that allying with a prestigious partner can provide an endorsement

effect and benefit the borrowers by reducing the price of bank loans. Moreover, a borrowing firm positioned at the centre of an alliance network enjoys a lower cost of bank loans.

Social capital shares some similarities with other forms of capital such as human and physical capital, such as the ability to generate external benefits that persist such as; information sharing among individuals and organizations, and the matching of people to economic opportunities, mutual aid and insurance, as well as effective collective action (Agénor and Dinh 2013). It is important to understand that social capital is not as easily alienable from the firm as physical or financial capital (Bourdieu 1986, Coleman 1988), nor is it as mobile as human capital (Moran 2005).

2.2.4.3 Risks of Social Capital

Although majority of research emphasize the positive benefits of social capital, there is plenty of evidence that social capital can yield risks and social liability (Portes 1998, Gabbay and Leenders 1999). Social relationships may constrain the behaviour of actors, impeding the attainment of goals. Strong social norms and high levels of cohesion can create over-conformity within group, as Smith Doerr and Powell (2010) suggest the ties that bind may become the ties that blind. Also, individual and collective actors may be affected by unfavourable relationships, such as dislike and distrust. Indeed, Labianca and Brass (2006) argue that in some circumstances negative relationships may have more explanatory power than positive relationships. Sometimes, the benefits of social capital in some contexts may be liabilities in another. For example, the solidarity benefits of sub-groups may lead to the fragmentation of the larger collective (Adler and Kwon 2002).

2.2.4.4 Creation of Social Capital

It is also important to understand whether the effects of social capital occur randomly or by design. Coleman (1998), suggests that social capital is a spin-off of activities engaged in for other purposes whereas Bourdieu (1986) suggests social capital can be deliberately developed and enhanced. However, the recent IOR research shows that social capital is both emergent and can also be encouraged (Singh and

Mitchell 2005, Maurer and Ebers 2006). The creation of social capital is a complex process heavily influenced by social, political, cultural factors and the economic activities in the environments of actors (Grootaert 2004, Grootaert and Narayan 2004). The factors that influence the creation of social capital (e.g. networks and social interactions) are sometimes referred to as indicators of social capital. Acquaah at el, (2014) explain that, an organization's social capital can be enhanced by the selection of individuals with learning potential and interpersonal skills, as well as by their involvement in decision-making processes and cooperative interaction, the sharing of information, knowledge and resources. Any discussion of the value of social capital has to take into account both investments in and returns on social capital (Raub, Buskens et al. 2013) because it is the result of purposeful efforts of individuals and organizations.

2.2.5 Social Capital and Inter-Organizational Relationships (IORs)

There is a growing body of research investigating the role of Social Capital in IORs. The topic has caught interest in many scholars of strategic management discipline (DeFillippi and Arthur 1998, Tsai and Ghoshal 1998, Bouty 2000, Tsai 2000, Adler and Kwon 2002, Koka and Prescott 2002, Ordonez de Pablos 2002). Social capital has been revealed to be influential in strengthening the supplier relations (Baker 1990, Helper 1990, Gerlach 1992, Uzzi 1997), regional production networks (Romo and Schwartz 1995), inter-organizational learning (Kraatz 1998) and creation of intellectual capital. In adopting the concept social capital, scholars seek to focus on the value of social contacts as a form of capital (Nahapiet 2008). According to Nehapiet (2007), *"Social capital is an especially powerful lens for the study of inter-organizational relations. First, it is a relational theory that takes as its prime unit of analysis the connections between actors. Second, social capital is a multidimensional construct that considers and seeks to integrate several different facets of inter-actor relations, including both the structure and the quality of their ties. Third, it can be used to describe and analyse a wide range of organizations: public, private, and voluntary, large and small, formal and informal, established and emergent. Fourth, it is a construct that can be applied across several different levels of analysis, from an*

individual person to an organization, region, or even nation, thereby enabling study of the impact and interrelationships between these different levels." Thus, it offers a valuable way to portray an organization's internal and external relationships (Koka and Prescott 2002).

Studies of social capital and IORs can be grouped into two. While some scholars view **social capital as a source of competitive advantage** for individual organizations, others view it as a **collectively owned resource**. Thus, understanding this concept is important because it enables us to explain the competitiveness differences among organizations. The studies in first group focus on individual benefits derived by organizations through social connections. For example, in a study of the organizations in the steel industry, Koka and Prescott (2002) defined social capital in terms of the information benefits (information volume, information diversity, and information richness) available to an organization due to its strategic alliances. Rottman (2008) explored a supplier network of a manufacturing business and identified beneficial outcomes (e.g. improved knowledge transfer, decreased development costs, shortened cycle time, increased the quality of developed deliverables etc.) produced by creating, managing and exploiting social capital within strategic alliances. The other group of studies view social capital as the property of the group and emphasize on mutual support and collective engagement (Putnam 1993, DiMaggio 1994, Adler and Heckscher 2006). As such, it can be a powerful enabler of inter-organizational entities (IOEs) (Morgan and Cooke 1998). Biggart and Delbridge (2004) suggest this type of social capital represents exchange based on social solidarity, shared identity, and bonds. In organizational terms, it resembles the collaborative community described by Adler and Heckscher (2006). In the context of IOR, research showing the importance of professional ties and connections as the foundation for successful exchange is representative of this line of inquiry (Bouty 2000, Ferlie, Fitzgerald et al. 2005). Using a case of bio-technology start-ups, Walker, Kogut and Shan (1997) demonstrated that network formation and industry growth are significantly influenced by the nurturing of social capital.

A sub-stream of literature, based on the notion of '**Collaborative Networks'**, focus on social capital as a collective resource in IORs. Scholars in this school posit that the

level of social capital present in a network of organizations, facilitates members' access to opportunities and initiatives for collaborative action there by making it the basic resource for a competitive strategy based on cooperation (Macke and Dilly 2010, Macke, SARATE et al. 2010, Macke, Vallejos et al. 2010, Macke, Vallejos et al. 2013). Collaborative networks are based on the collaboration between membering organizations, according to a shared goal. A collaborative network organization (CNO) is a form of emerging organizational setting that involves mutual engagement of participants to solve a problem together, which implies mutual trust, and therefore takes time, effort and dedication. A CNO can be created from a regional grouping of companies that already have a longstanding relationship and a cultural history (Camarinha-Matos and Afsarmanesh 1999). In this sense, social capital becomes a strongly competitive resource, enhancing the individual and collective capacity through the collaborative practices.

Given the relational and multi-dimensional nature of social capital, Network Science provides an appropriate toolkit to investigate aspects of social capital in IORs. Network approaches constitute one of the most important streams of research focusing on the role of social capital in IORs (Baker 1990, Powell, Koput et al. 1996, Uzzi 1996, Uzzi 1997, Gulati, Nohria et al. 2000, Zaheer and Bell 2005). Bourdieu and Wacquant (1992, p.119) defined social capital as the "*Sum of resources that accrue to an organization by virtue of possessing a durable network of inter-organization relationships*". Most work adopting social exchange and structural network theory perspectives assumes exchange occurs through rational choice based on self-interest. It typically views social capital as an asset for the individual actor. Burt (2000) describes social capital as a metaphor for competitive advantage.

Through his influential work on '**embeddedness**', Granovetter (1973, 1985) argued that economic action is socially situated and cannot be sufficiently explained by either individual motives or institutional arrangements. Rather, action is embedded in ongoing systems of social relations that exert a significant influence on behaviour and performance. Granovetter (1992) analysed the consequences of both existence of personal relations and the structure of these relations for the production of trust in economic life. Both aspects continue to feature strongly in research on social capital,

including work on IOR (Uzzi 1996, Dacin, Ventresca et al. 1999, Rowley, Behrens et al. 2000, McEvily and Marcus 2005, Hagedoorn 2006).

While social capital is becoming a progressively imperative perspective for the study of inter-organizational relations, it is also notable that the research on IORs is contributing to the knowledge on the social capital (Nahapiet 2008). While it is debatable that IORs may lead to the creation of social capital in the inter-firm level, some authors argue that there may be reciprocal relationships between trust and cooperation (Nahapiet and Ghoshal 1997). Cohen and Fields (1999) also explored this issue in trying to explain the relative success of Silicon Valley as a region characterized by many successful IOEs. On the other hand, Maurer and Ebers's(2006) note that inter-organizational social capital can be both a benefit and a source of inertia for firms, particularly through relational and cognitive 'lock-in'. For example, while network cohesion and closure can be highly productive in the start-up phase, it can become a significant constraint as business develops. In this stage firms need to maintain the benefits of existing ties whilst expanding their networks and strengthening connections to different players. A detailed review of literature pertaining to the specific effects of social capital with relation to the formation of IORs will be discussed in Chapter 3 of this thesis.

2.2.6 Definition of Social Capital for this Study

This research attempt to understand the dynamics of multiple dimensions of social capital in the inter-organizational collaboration, specifically in the form of strategic alliances. In other words, this study views the social capital available at the level of individual organizations as a source of competitive advantage for the firm that enable the firm to do better in IORs, specifically, in the formation of formal collaborative partnerships with other organizations. Here, the individual organization's social capital is measured through its external social relations with other organizations incorporating structural, relational and cognitive dimensions. The study takes the degree of formal, strategic collaborations thatan organizationis involved in as the dependent construct and investigate how different dimensions of social capital affect inter-organizational collaboration. This view is a combination of the traditional

views of ‘individual’ and ‘collective’ social capital. Although the degree of collaboration ofan organizationcan be viewed as a firm-level benefit, it is evident that inter-organizational collaboration also yields industry level benefits.

In the context of this study, the external social networking ties of organizations with its external stakeholders and the resources latent within these networks are considered as a valuable, intangible resource available for individual organizations, namely Social Capital, incorporating its structural, relational and cognitive dimensions. Accordingly, the social capital is defined in this study as “**the sum of actual and potential resources embedded within, available through, and derived from the external social network of organizations**”, following the definition of Nahapiet and Ghoshal (1997). At the inter-organizational level, structural social capital refers to the structure of inter-organizational social connections. It focuses on availability, frequency and the structure of social ties, which lead organizations to share resources. Relational social capital refers to the quality of these inter-organizational links such as trust, which is developed through a history of interactions. Cognitive social capital refers to the common perceptions shared by organizations such as vision, values, representations, interpretations, and shared systems of meanings.

2.3 Inter-Organizational Relationships (IORs)

2.3.1 Definitions and Forms

"United we stand; divided we fall" -Aesop

The study of Inter-Organizational Relationships (IOR) is concerned with understanding of the patterns, origins, rationale, and consequences of relationships between and among organizations (Cropper 2008). IOR terminology commonly include partnership, alliance, network, Inter-Organizational Entities (IOEs) and Inter-Organizational Collaboration (IOC). While the relationships can range from dyadic to networks of many organizations, empirical instances of IORs can involve relations between; organizations and state-owned enterprises; organizations and governmental agencies; governmental agencies; organizations and non-governmental organizations (NGOs); governmental agencies and community organizations and so on. Researchers have attempted to study IORs from a wide range of theoretical perspectives including transaction cost theory (Coase 1937), agency theory (Berle and Means 1991), network theory (Eccles and Crane 1987), behavioural theories (Barnard 1938), property rights theory (Barzel 1989), economic empirical studies (Heidl 2010), strategic management positioning and resource-based complementary perspectives (Heidl and Phelps 2010), dynamic capabilities theory (Zollo and Winter 1999), real option theory and institutional theories (Bellon and Niosi 2001).

With the globalisation and the development of ICT, there has been a significant growth in various types of inter-organizational collaborations. Researchers have defined the term differently in the economic and business literature (Kogut 1988, Gray 1989, Williamson 1991, Burgers, Hill et al. 1993, Parkhe 1993, Hargadon and Sutton 1997, Austin 2000). '**Franchises'** (Friedlander 1981), '**Strategic networks'** (Powell, Koput et al. 1996) '**R&D consortia'** (Ouchi and Bolton 1988) and other terms such as '**Joint ventures', 'Joint products', 'Market sharing', 'Training', 'Know-how licensing' and 'Service agreements'** also refer to different forms of collaboration (Contractor and Lorange 2002). Chaharbaghi et al. (2005) classified and ordered inter-organizational relationships based on the level of integration and formalization in the governance of their inter-organizational relationships; market relations, action sets,

industry standards groups, subcontractor networks, licensing, franchising, cartels, strategic cooperative agreements, R&D consortia, cooperatives, equity investments, joint ventures and hierarchical relations. While the market transactions require no obligation for cooperation, coordination, or collaboration, in hierarchical authority relations, one firm takes full control, absorbing another's assets and personnel into a unitary enterprise.

Cooperation is the original form of inter-organizational relationship, but it also refers to a broader range of operational activities between individuals and departments. In general, the word 'co-operate' means 'working together' (Fitzek and Katz 2006). It is widely used in economics, managerial and sociology studies (Parkhe 1993, Fitzek and Katz 2006). Scholars have linked cooperation with reciprocity as one of the benefits from inter-firm collaboration (Withered 1980, Parkhe 1993, Kashlak, Chandran et al. 1998). In the modern business language, '**Co-operation**' has been increasingly considered superior to competition from both intellectual and social concerns (Faulkner and De Rond 2000).

Buckley and Casson (1998) defined interfirm '**Coordination'** as an increase in the profits of some firms that is achieved without a reduction in the profits of others. Therefore, coordination is used in the same way as cooperation and collaboration in the literature (Currall and Judge 1995, Grandori and Soda 1995). '**Partnership'** is also regarded as a collaboration (Hagedoorn and Schakenraad 1990, Hagedoorn 2006) with reference to the meaning that more than one firm shares responsibilities. **'Contracts'** are important for long-term collaboration where there are high uncertainties. Many researchers have studied the reasons, processes, contributions and limitations of contracts in inter-firm collaboration (Harrison 2004, Harvey, Novicevic et al. 2005, Jennejohn 2008). Some researchers believe that formal contracts may signal distrust between the partners aimed at opportunistic behaviour (Ghoshal and Moran 1996, Fehr and Gächter 2000).

Strategic alliance is another popular strand of IORs in the literature (Nooteboom, Berger et al. 1997, Kuada 2002). Hamel (1989) defined strategic alliance simply as a "*collaboration typically between two organizations with the goal of providing mutual*

benefit for each firm". A strategic alliance involves sharing: goals, mutual benefits, co-production, technology, or services (Mohr and Spekman 1994, Gulati 1995). Porter (1990) and Hagedoorn (1993) linked the definition of alliance with long-term transactions. If one thinks of market transactions on a spectrum from 'arm's length' to 'relational', strategic alliances are typically viewed as the latter case. Lewis (1990) defined a strategic alliance as a "*collaborative relationship between firms which generates more profits than solely by means of a market transaction*". Chan et al, (1997) defined it as "*voluntarily initiated organizational agreements between organizations, corporate alliances bring together otherwise legally independent organizations to share the costs and benefits of a mutually beneficial activity*". Corporate alliances involve substantial relation-specific investments and long-standing cooperative mechanisms, blurring organizations' boundaries through a network of relationships that can be an important source of value (Baker, Gibbons et al. 2002, Gay and Dousset 2005).

'**Co-opetition'** has emerged as an increasingly popular concept in the field of IORs (Gnyawali, He et al. 2006, Luo 2007, Brandenburger and Nalebuff 2011, Gnyawali and Park 2011) which means both collaborating and competing with the same partners at the same time. These studies suggest that businesses need to be very strategic in dealing with other organizations and suggest the importance of collaborating with competitors for innovation and performance. In high-technology sectors with changing dynamics, businesses cannot survive without networking with their competitors. The significance of co-opetition appears to be even greater in the context of Small and Medium-Sized Enterprises (SMEs) (Gnyawali and Park, 2009) because small businesses are more susceptible to environmental forces (Morris, Kocak, and Özer, 2007) and face many challenges such as uncertainty in technological development and lack of resources to pursue large-scale projects (BarNir and Smith 2002; Gomes-Casseres 1997). Co-opetition helps to increase technological diversity and combine complementary resources of firms (Quintana-García and BenavidesVelasco 2004). For example, Dowling, and Welpe (2006) argue that a firm can collaborate with competitors as subcontractors or can form alliances in order to handle large projects. Merrifield (2007) suggests that collaborations are critical for the survival of SMEs. Scholars suggest that by collaborating with competitors, SMEs can create economies

of scale, mitigate risk, and leverage resources together (Morris, Kocak, and Özer 2007). Co-opetition is also positively related to financial performance (Levy, Loebbecke, and Powell 2003), Lechner. SMEs may pursue this complex strategy more easily than can larger organizations as they are less constrained by structure, procedures and policies. If used wisely, co-opetition may also be a valuable risk management tool when uncertainties are high.

Although expressed using varied terms, all IORs commonly involve two or more organizations working together to achieve mutual benefits, resulting in some degree of inter-organizational collaboration (IOC). Inter-Organizational collaboration is generally defined as "*any joint activity by two or more agencies working together that is intended to increase public value by their working together rather than separately"* (Bardach apud O'Leary and Vij, 2012, p. 508). It becomes widely applicable in the private, public as well as non-governmental sectors. Mounting significance of inter-organizational collaboration mostly results from the environmental challenges and quest for competitive or cooperative advantage. Organizations can deliver services in a more effective way through collaboration (Leung, 2013). Introducing the theory of collaborative advantage, Vangen and Huxham (2010) analyse collaboration as a management tool and shows that it yields benefits regardless of its scope, forms and intensity. "*Collaborative advantage will be achieved when something unusually creative is produced*" (Huxham apud O'Leary and Vij, 2012, p. 510)

In this study, the terms Inter-Organizational Collaboration (IOC) and Inter-Organizational Relationships (IOR) are used interchangeably to refer to the extent of connections an organization has with other organizations. The specific type of IOR focused in this study are explained in the forthcoming section 2.3.6.

2.3.2 Benefits of Inter-Organizational Collaboration

"Keep your friends close, but your enemies closer".

*(*The Godfather Part II (1974), written by Mario Puzo & Francis Ford Coppola*)*

The resource-based view in strategic management focuses on explaining the firm performance based on resources and capabilities internal to the firm (Barney 1991). With the increasing strategic importance of IORs, attention shifted to the resource flows in inter-organizational arrangements. Most theoretical and empirical research on inter-firm collaboration has focused on the motives and formation of collaboration (2014). However, less attention has been given to the real benefits brought by collaboration (Gulati 1998, Kale and Singh 1999). Some researchers have argued that the performance from an alliance has received less attention because it is hard to measure (Baird, Lyles et al. 1993, Saxton 1997). However, firms are believed to get many benefits from collaboration (Dyer and Singh 1998, Zacharia, Nix et al. 2011) . Doz and Hamal (1998) described three generic motivations underlying many alliances; co-specialization, co-option and co-learning. It is important to note that partnerships may also be mandated by triggering entities for collective purposes (Dyer and Nobeoka 2000). In this case, the intermediation is essential for the establishment as the collaborators do not have strong stimuli to cooperate (Thune and Gulbrandsen 2014). In the following sections, a number of benefits resulting in from inter-organizational partnerships are summarized.

Access to scarce resources: One of the primary motivation that drive organizations to collaborate is the resource limitation. Many IOEs are established so that firms can benefit from resources which they do not own but access to which can be arranged through interfirm agreements (Mowery, Oxley et al. 1996, Dyer and Singh 1998, Lavie 2006). Organizations may enter into alliances, when they see a possibility to pool resources and create extra value for both organizations (Nohria and Garcia-Pont 1991), to access new technologies or skills (Wernerfelt 1995) or due to perceived resources complementarity (Doz, Olk et al. 2000). With the development of new technologies, many firms collaborate to access new technologies or skills (Barney 1991, Wernerfelt

1995). Corporate alliances allow the participating organizations to gain access to complementary resources and strengthen their competitive positions (Gulati 1995, Baum, Calabrese et al. 2000) and provide an important option for organizations to grow (Habib and Mella-Barral 2006, Lindsey 2008).

Intangible benefits: Inter-firm collaboration usually generates a combination of different tangible and intangible benefits (Su, Yang et al. 2009). Intangible benefits play an important role in inter-firm collaboration in developing countries (Kuada 2002, Jia and Rutherford 2010). The intangible benefits can be non-financial future returns such as: increased relationships with potential partners, increased business industry reputation or increased relationship with government departments (Lu and Yao 2006). These intangible benefits play more important roles in inter-firm collaboration in emerging economies (e.g. China).

Information is an intangible asset for firms. Information is an intangible asset and is important to all businesses (Smith, Allee et al. 2006). The sharing of information brings more opportunities for firms. Collaboration, on the other hand, helps to reveal information, transfer tacit technologies, and guarantee performance (Dyer and Singh 1998, Al-Rasheed and Al-Qwasmeh 2003, Zacharia, Nix et al. 2011). Inter-organizational networks were also used to mitigate the uncertainty of incomplete information about business exchange opportunities (Lee 2007). External networks in the form of network alliances may play the role of a buffer, which may reduce any direct impact on the organizations from the environmental hazards (Baum et al., 2000). Existing research documents that alliance activities can result in information spill-over (Gomes-Casseres, Hagedoorn et al. 2006), and increased information flows among organizations may well inform potential lenders about the riskiness and future prospects of borrowing organizations, thus reducing the adverse selection problem.

Innovation: Cricelli and Grimaldi (2009) argue that knowledge-based inter-firm collaboration can bypass many limitations on traditional collaboration and benefit all firms involved. Therefore, interfirm collaboration can generate mutual benefits for basic R&D, innovation, and technological complementarities (Nooteboom 2004, Richards and Yang 2007, Lin, Jiang et al. 2011, Zacharia, Nix et al. 2011).

Increased market reach and market influence: Organizations often focus on strategies to increase their global market share. Collaboration is one of the most efficient ways to achieve this goal (Elg 2007). Market share can be measured using a number of different methods such as the number of customers, annual productivity, or sales within a certain market (Kale and Singh 1999, Kale, Dyer et al. 2002). In order to access a new market or expand business networks, firms need to understand the different culture, customs and regulations of that market, which may be very costly. However, with an experienced trade partner, it is possible to achieve the goal quickly with lower cost (Kuada and Sørensen 2005). Therefore, collaborating firms can make more profits, while firms that do not collaborate may be driven out of the current market (Freeman and Soete 1990) or be unable to enter a new market. Organizations that wanted to explore new markets would try to reduce uncertainties by gathering information from network partners (Lee 2007). Landsburg (2005)defined market power (monopoly power) as the ability of a firm to affect market prices through its actions. Some researchers have argued that firms can enhance their market power by forming a collaboration (Elg 2007).

Increased productivity and quality: Collaboration is believed to have a positive effect on increasing product and service quality and reducing defect rates (Dyer 1996, Kale and Singh 1999, Zacharia, Nix et al. 2011). Scholars argue that collaboration can help to increase productivity, profitability, and product quality for each participant by reducing input costs and exchanging resources (Hagedoorn and Schakenraad 1990, Whitford and Zeitlin 2004). Collaborations can lower the production and management costs of firms, thus lowering their total cost (Kuada and Sorensen 2005; Lin et al. 2011; Zacharia et al. 2011). Collaborations help eliminate duplicative costs and excess capacity through shared facilities, information, services, or activities (Austin 2000; Whitford and Zeitlin 2004). Lower cost also increases the competitiveness of the company as a result of inter-firm collaboration.

Survival of new organizations: Another need-based motivation that drives organizations to ally with others as a mechanism of survival are uncertainty and risks. Alliances and joint ventures help new organizations to gain entry into new markets in

the increasingly global market environment (Gillespie and Teegen 1995). Start-up organizations tend to rely upon their external networks to provide both opportunities and resources for the survival (Brüderl and Preisendörfer 1998). Thus, resource poor small new organizations ought to network with identified critical resource suppliers (Larson 1992). In order to obtain high-value from external networks, entrepreneurs need to intentionally exploit complementary resources in their networks (Rothaermel 2001). According to Lee (2007), the early application of network concept to business setting is to avoid uncertainty. For instance, in competitive advantages studies, Alvarez and Barney (2001) describe and identify the actions that entrepreneurial organizations take to appropriate more of the value created by their alliance with large organizations. They also describe how the relations create economic value for both organizations and yet the entrepreneurial firm is not put at survival risk (Alvarez & Barney, 2001). In organizational development aspects, Stuart (2000) examines the relationships between organizations in high-technology industry, and finds that young and small organizations can grow and benefit more from strategic alliance with large and innovative organizations than old and large organizations benefit from large and innovative strategic alliance partners (Stuart, 2000).

Avoid Vulnerability: Elsenhardt and Schoonhaven (1996) present an excellent empirically-based evidence of when and why alliances are used. They found that alliances were formed when the organizations are in vulnerable strategic positions or if the organizations are involved in fast moving innovative technologies and has a top management with well-established contacts. In general, the alliances were sought in highly uncertain environment. Previous research also provided evidence that alliances were formed in highly regulated industries that are undergoing de-regulation such as telecommunication (Bae and Insead 2004), during privatization of airline industry (Tully 1996), finance industry (Astley 1984) and automobile manufacturing industry (Monteverde and Teece 1982).

Emerging Industries: On the other hand, many emerging industries tend to rely on collaborative initiatives with larger organizations (Powell and Brantley 1992, Zollo, Reuer et al. 2002). In these cases, alliances help sharing very high costs, high risks of R&D activities while giving access to complementary resources and competencies.

Collaborative manifestations have also been mandated by governments of developing economies in certain situations (Kale and Anand 2006). As a result, an increasing number of firms see collaboration as an important business strategy. The number of inter-firm collaborations has increased dramatically during the last decade, greatly increasing the process of globalisation. However, different firms have very different types of collaborations. It also varies from different industries and countries. To answer the question '*How do firms collaborate?*', it is important to study the different types of inter-firm collaboration first.

2.3.3 Pre-Conditions of Inter-Organizational Collaboration

Literature presents a range of success factors of inter-organizational collaboration. The reason why there is no single formula for evaluating success is that it is hard to measure (Anderson and Narus 1990). The criterion may be very different for each industry and even for each firm (Dussauge and Garrette 1995, Gulati 1998). Thomson et al. (2009) defined Collaboration as a "*process in which autonomous or semi-autonomous actors interact through formal and informal negotiation, jointly creating rules and structures governing their relationships and ways to act or decide on the issues that brought them together; it is a process involving shared norms and mutually beneficial interactions*". This definition emphasizes that collaboration is a multi-dimensional construct composed of five key dimensions, two of which are structural in nature (governance and administration), two of which are social capital dimensions (mutuality and norms), and one of which involves agency (organizational autonomy). Blostein (1983) defines strategic alliances as a form of coordination and describes elements that are intrinsic to the process of coordination: Types, Structure, Medium and Auspices.

Borrowing from Whetten (1981), Blostein (1983) and summarizes pre-conditions necessary for voluntary and mandatory coordination. In the case of voluntary coordination, **positive attitude towards coordination, clear need for coordination, awareness of potential partners, perceived compatibility (and complementarity) and capacity (resource and structure)** to maintain the process are viewed as

necessary conditions. When the coordination is mandated, different factors such as awareness of mandate, compatibility (equal status), common perception of the problem capability to maintain are seen as the pre-conditions.

There are also other conditions that affect success of inter-organizational collaboration. Zhang (2014) summarized the core ingredients of a successful inter-firm collaboration as trust, communication, size and process, experience and histories and culture similarity. Some researchers believe that partially shared ownership (Kale and Singh 1999, Parker 2000), useful information (Kuada 2002), effective communication (Parker 2000; Zacharia et al. 2011; Kuada 2002; Elg 2007) similar firm size and processes (Park and Ungson 1997, Gulati 1998, Singh and Mitchell 2005, Felzensztein and Gimmon 2007), building trust (Parker 2000, Lau and Rowlinson 2009, Six, Nooteboom et al. 2010, Zacharia, Nix et al. 2011), taking a long-term viewpoint (Lorange, Roos et al. 1992), Experience and histories (Kogut et al. 1992; Gulati 1995; Hagedoorn et al. 2003; Harrison 2004; Singh and Mitchell 2005; Zacharia et al. 2011), Culture similarity (Vilana and Monroy 2010), product diversity (Gulati 1998) (Gulati 1998), systematic partner search (Kuada 2002), or continuity of interface personnel (Bleeke and Ernst 1990) are the important predictors of successful inter-firm collaboration.

These elements are very important to collaboration in real world cases. However, each of them alone is not sufficient for successful inter-firm collaboration. The reason why there is no single formula for evaluating IOR success is that it is hard to measure (Anderson 1990). The criterion may be very different for each industry and even for each firm (Dussauge and Garrette 1995; Gulati 1998).

Pre-conditions of collaboration identified through literature are summarizes in the table 2.4, considering the voluntary and mandatory collaborations. Any IOR involves two or more parties. For a successful collaboration, the preconditions should be satisfied from the both partnering organizations.

Table 2.4 : Pre-Conditions for Inter-Organizational Collaboration

	Conditions for Voluntary Collaboration
Willingness to collaborate	• Clear need • Positive attitude towards collaboration • Perceived resource complementarity • Perceived compatibility • Perceived trustworthiness
Capability to collaborate	• Ability to identify potential partners • Capacity to contribute (resource and structure) • Effective Communication
	Conditions for Mandatory Collaboration
Willingness to collaborate	• Awareness of mandate • Common perception of the problem
Capability to collaborate	• Compatibility (equal status) • Capability to maintain • Effective Communication

2.3.4 Measurement of Inter-Organizational Collaboration

Assessing collaboration is often difficult. Although collaboration has a variety of definitions and names, is generally treated as meaning the cooperative way that two or more entities work together toward a shared goal. However, a comprehensive theory of collaboration has not been presented in the literature. Collaboration among businesses as a profit strategy and models of the dynamics of those relationships have been explored in the management and networking literature (e.g. Chaharbaghi, Adcroft et al. 2005). Additionally, some researchers have explored the specific nature of successful relationships within school and business partnerships (Ash 1989). Biostein (1983) presented 'The Coordination Dimensions Scale', a tool that was built for the use of human service organizations in assessing the viability of a coordinated relationship involving various components of coordination: types, structural forms, medium, and auspices. He defined 'mutual adjustments', 'alliances' and 'corporates' as structural forms of coordination. Todeva and Knoke (2005) classified inter-organizational collaboration using the level of integration and the level of formalization as axis. A similar description of moving from loose integration to greater

consolidation in collaborative alliances between government and non-profits was provided by Arsenault (1998).

Preliminary models of collaboration within social-service-oriented alliances have been presented (Peterson 1991, Hogue 1993, Bailey and Koney 2000, Gajda 2004, Frey, Lohmeier et al. 2006). These models commonly focus on stages of collaboration through which interagency initiatives might move. Gajda (2004) argued that groups will pass from lower to higher stages of collaboration before they can be effective. These stage theories describe levels of collaboration, with the lowest level being little or no collaboration and the highest level being full collaboration or, ultimately, complete unification. The models differ on the number of stages, the range of levels included, and the definitions of various stages, but they have much in common. Following is a summary of these **stage models** of collaboration found in literature;

- Peterson (1991) proposed three types of agency interaction: cooperation, coordination, and collaboration. Peterson described distinct states of interactions among agencies and not offered as a strict series of stages. In Gajda's (2004)(2004) review of Peterson's model, they are presented as a three-point continuum. These categories are differentiated on the basis of the degree of member autonomy associated with each.
- Hogue (1993) suggested five levels of *community linkage*: networking, cooperation or alliance, coordination or partnership, coalition, and collaboration. The levels differ by purpose, the structure of decision making, and the nature of leadership.
- Bailey and Koney (2000) offered a model similar to these, with four steps ending with complete unification: cooperation, coordination, collaboration, and coadunation.
- A five-stage model consistent with previous stage approaches was suggested by Gajda (2004). The *level-of-integration* model has five ordered steps: networking, cooperating, partnering, merging, and unifying. The steps differ on purpose, tasks and organizational strategies, leadership and decision making, and type and frequency of communication.
- Frey et al (2006) produced a summary and a comparison of the various stage approaches to collaboration among groups offered in the literature using

uniform terms are used to label stages, with terminology specific to each model indicated where necessary. It includes a seven-stage model, which simply extends the previously identified stages to include the possibility that while both groups exist, there may be no collaboration whatsoever between them.

- During a critical analysis of analysed inter-organizational collaboration and partnerships, Applegate (2006) identified five levels of inter-organizational relationships: independent, coordinating, cooperating, collaborating and integrating.

This thesis identifies that the relationships between organizations can be simply categorised in three levels as coordinating, cooperating and collaborating, considering aspects such as length of time, level of formality and risks involved in the relationship. The following table provides a summary of characteristics in each type of interaction.

Table 2.5 : Three Types of Inter-Organizational Collaboration

Level of IORs	Characteristics
Coordinating	Coordination is characterized by informal relationships that exist without any commonly defined mission, structure, or planning effort. Information is shared as needed, and authority is retained by each organization so there is virtually no risk.
Cooperating	Cooperation is characterized by more formal relationships and an understanding of compatible missions. Some planning and division of roles are required, and communication channels are established. Authority still rests with individual organizations, but there is some increased risk to all participants.
Collaborating	Collaborations bring previously separated organizations into a new structure with full commitment to a common mission. Such relationships require comprehensive planning and well-defined communication channels operating on many levels. Authority is determined by the collaborative structure. Risk is much greater because each member of the collaboration contributes its own resources and reputation. Resources are pooled or jointly secured, and the products are shared.

While the inter-organizational coordinating relationships simply characterize fully independent organizations merely engaging in informal, quick interactions, cooperation occurs when organizations work cooperatively for a common goal.

However, collaboration is a stronger link where partnering organizations enter into a formal and long term arrangement to achieve shared goals. **Collaboration** is also defined as *"a durable relationship that brings previously separate organizations into a new structure with commitment to a commonly defined mission, structure, or planning effort"* (Perrault, McClelland et al. 2011p. 283). The focus of this study is on such inter-organizational collaborative links.

2.3.5 IORs in the Finance Domain

A notable feature of the modern financial world is its high degree of interdependence. The banking system can be essentially described as a network. The incentives for linking are driven by the benefits these links bring. For instance, banks can solve their liquidity unbalances without requiring the intervention of a Central Bank simply by transferring funds from the ones that have a cash surplus to those with a cash deficit. The supply and demand for liquidity connect in this way the financial institutions into a network.

The theoretical literature mainly concentrates on contagious effects via direct balance sheet interlinkages. Freixas et al. (2000) studied the case of banks that face liquidity needs and showed how interbank credit links enable hedging regional liquidity shocks. Dasgupta (2004) also discussed how cross-holding of deposits can be a source of contagious breakdowns. Parallel to this, there is a number of theoretical papers that focus on indirect linkages. There is also evidence that there is dependency between banks portfolios, and this carries the potential for systemic breakdown (Lagunoff and Schreft 2001, De Vries 2005). Subsequently, the stability of the interbank market is tested by simulating the breakdown of a single bank. Literature shows evidence of such studies on interbank markets from different countries such as Germany (Upper and Worms 2004), Sweden (Sheldon and Maurer 1998), Portugal (Cocco, Gomes et al. 2009), US (Chung, Singh et al. 2000), UK (Wells 2004), Australia (Boss, Elsinger et al. 2004) and Belgium (Degryse and Nguyen 2004). At the base of the link formation process lies the same intuition developed in Allen and Gale (2000): better connected networks are more resilient to contagion.

The finance literature has also recognized the importance of strategic alliances. Among a relatively small number of studies that directly examine the financial consequences of corporate alliances, Chan et al. (1997) are the first to document the wealth-creation effects of strategic alliances. Allen and Phillips (2000) investigate block ownership purchasing and document significant increases in targets' stock prices and profitability when such purchases are combined with strategic alliances. Other research has shown that strategic alliances involving equity stakes can be used as an effective way to deter entrance (Chen and Ross 2000). The literature also suggests that strategic alliances are the dominant source of external financing for R&D in biotech firms, (Lerner, Shane et al. 2003). Nicholson et al (2005) identified that in an environment with imperfect information, allying with prestigious partners can signal the quality and future growth potential of organizations, and enable them to receive a substantially higher valuation from venture capitalists and IPO markets. Additionally, Lindsey (2008) finds that two entrepreneurial firms are more likely to form alliances if they share a common venture capitalist. While the existing finance literature has explored, some issues related to corporate alliances, evidence is still scant with respect to the financial consequences of organizations' alliance activities (Lerner and Rajan 2006).

Banks are linked in a variety of ways for a variety of reasons. Lacking the sound regulatory frameworks that characterize the fully developed financial systems, the banking systems of emergent economies face more challenges and risks and the networking with other organizations in the industry therefore can be interpreted as a decentralized insurance scheme thatan organizationwould adopt. Similar to IORs in other contexts, the interbank IORs also can be classified on a spectrum based on the level of integration and formality starting from '**Arm's length**' links to '**Relational**' links which involves direct, long term interactions between organizations. Strategic alliances are typically viewed as the latter case.

The Financial Market, which is the market for credit and capital, can be divided into the Money Market and the Capital Market. The Money Market is the market for short-term interest- bearing assets with maturities of less than one year, such as Treasury bills, commercial paper, and certificates of deposits. The major task of the Money Market is to facilitate the liquidity management in the economy. The main issuers in

the Money Market are the Government, banks and private companies, while the main investors are banks, insurance companies and pension and provident funds. The Capital Market is the market for trading in assets for maturities of greater than one year, such as Treasury bonds, private debt securities (bonds and debentures) and equities (shares). The main purpose of the Capital Market is to facilitate the raising of long-term funds. The main issuers in the Capital Market are the Government, banks and private companies, while the main investors are pension and provident funds and insurance companies.

The Financial Market can also be classified according to instruments, such as the debt market and the equity market. The debt market is also known as the Fixed Income Securities Market and its segments are the Government Securities Market (Treasury bills and bonds) and the Private Debt Securities Market (commercial paper, private bonds and debentures). Another distinction can also be drawn between primary and secondary markets. The Primary Market is the market for new issues of shares and debt securities, while the Secondary Market is the market in which existing securities are traded. Figure 2.1 presents a classification of IORs in the banking domain.

<table>
<tr><th colspan="2" rowspan="2"></th><th colspan="2">Length of Time of Commitment</th></tr>
<tr><th>Short term
(less than one year)</th><th>Medium to Long term</th></tr>
<tr><td rowspan="2">Nature of Interactions</td><td>Indirect</td><td>• Payments and Settlements
• Money Market Transactions (Short term loans)</td><td>• Membership in Regulatory Bodies
• Capital Market Transactions. (Equity Sharing)
• ICT Integrations (Shared systems)</td></tr>
<tr><td>Direct</td><td>• Interbank Loans - Branch Level</td><td><u>Relational Links</u>
• Resource Sharing Agreements
o HR Agreements
o Service Agreements (Correspondent Banking)
o Infrastructure Sharing Agreements
o Technology Sharing Agreements (ATM sharing etc.)
• Alliances (Syndications, Project financing)
• Joint Ventures</td></tr>
</table>

Figure 2.1 : Types of Inter-Bank Relationships

2.3.6 Type of IOR Focused in this Study

This study attempts to answer the question, '*why some organizations do better in inter-organizational collaborations than others*' using empirical evidence from Sri Lankan interbank context. Inter-firm collaboration is defined in this thesis as "**formal, long term inter-firm arrangements that are aimed at generating benefits for each firm involved**".

This study is focused on the **inter-organizational alliances** between banking organizations in the form of syndication alliances. As such, the present research considers the role of externally derived social capital of individual banking organizations, defined in terms of firm-level and managerial social interactions, perceived trustworthiness and shared understandings, in the strategic alliances, in the inter-bank context in Sri Lanka, a sample that consists of public and private banking organizations participating in syndicates between 2013 and 2015

Syndication alliances are comparable to forming an inter-organizational strategic alliance in many ways. In general, a syndicate is a form of long term partnership between two or more organizations to achieve a shared goal while sharing the associated risks. Syndicated loans hinge on the creation of an alliance of smaller banking institutions that, by joining forces, are able to meet the credit needs of the borrower. Forming a syndicate requires identifying suitable partners and negotiating terms of the agreement regarding sharing of risks and benefits. Another strength in this context is that even though the banking industry is highly regulated in general, the partnership in syndications are largely voluntary. Chung at el (2000) focused on syndications alliances of U.S. investment banks in a study of inter-organizational strategic alliances and revealed that banks' resource complementarily, status similarity and social capital in terms of prior alliances and reciprocity in opportunity exchange are important factors in alliances formation.

Alliances are inter-firm cooperative arrangements designed to accomplish strategic objectives of the partners (Das and Teng 1998). Inter-firm alliances can be classified according to whether or not their governance structure involves equity (Das and Teng

2000, Wright and Lockett 2003). Non-equity-based alliances doesn't involve equity transfer and only include contractual-based arrangements whereas equity-based arrangements involve the transfer or creation of equity ownership. Syndication loans in the banking industry are closely related to non-equity-based alliances such as the venture capital syndications. Venture capital syndication involves two or more sponsors investing in an independent legal entity, and the returns are determined by the performance of the entity (Wright and Lockett 2003). Both syndicate arrangements typically contain a lead firm and non-lead firms and is temporary in nature. Venture capital firms also typically perform repeat syndication arrangements with a network of partners over time in different investments (Robbie, Wright et al. 1997).

The process, stages, drivers and barriers of inter-bank alliances will be discussed in detail in the chapter 3.

2.4 Network Approach

2.4.1 Introduction to Network Terminology

Network science is an emerging scientific discipline that examines the inter-connections among diverse entities. Actors (nodes) are network members such as people, groups, organizations, computers. Relational ties (edges) link actors within a network. These ties can be informal or formal. Links between nodes may be binary or weighted. The weight of a link represents the strength of interactions between the neighboring nodes. Directions of the links represent the direction of the information or resource flow. Nodes and links both may be described in detail with attributes. This field of science seeks to discover common principles, algorithms and tools that govern network behavior. The earliest known paper in this field is the famous *Seven Bridges of Königsberg* written by Leonhard Euler in (Euler 1956) which laid the foundation of graph theory, that studies the properties of pairwise relations in a network structure.

Social network analysis (SNA) is the study of social structure. In its simplest form, a social network is a map of specified ties, such as friendship, between the nodes (people and groups) being studied. The nodes to which an individual is thus connected are the **social contacts** of that individual. These concepts are often displayed in a social network diagram, where nodes are the points and ties are the lines. SNA provides both a visual and a mathematical analysis of human relationships. The resulting graph-based structures are often very complex. Actors can have multiple ties with other actors, a feature known as multiplexity. The network can also be used to measure social capital – the value that an individual gets from the social network. Research in a number of academic fields has shown that social networks operate on many levels, from families up to the level of nations, and play a critical role in determining the way problems are solved, organizations are run, and the degree to which individuals succeed in achieving their goals.

In the context of IORs, the word ‘Network’ is often used synonymously for ‘partnership’, ‘collaboration’, ‘alliance’. An emerging line of inquiry in IORs is the concept of ‘Collaborative Networks’ where the network of collaborative partnerships among organizations is viewed as a source of competitive advantage for organizations

(Macke et al 2010). At other times, it is used with more specific intention to describe the relationships between groups of individuals or organizations, and the resources to which members get access. Management consultants use When the SNA is applied in business domains, it is referred to Organizational Network Analysis. These relationships can be investigated empirically. Networks and network resources are also an important component of the growing literature on social capital.

Structural Properties: The smallest social structure in which an individual can be embedded is a 'dyad' (a pair). For binary networks, s tie may be present or absent between a pair of nodes. Directed relations between two nodes can represent more information giving rise to three possibilities of dyads. (i.e. no tie, one likes the other but not vice versa, or both like each other). The smallest structure representing a 'society' is the triad which includes three actors. Such a structure 'embeds' a pair in a structure where 'another' is present. Actors can be also embedded in 'clusters' defined either by some shared attribute. Clusters are formed when actors tend to link more with a local group of actors in a population.

Topologies: Network science efforts have recently focused on describing different network topologies mathematically. A 'small-world' is a type of network in which most nodes are not neighbours of one another, but most nodes can be reached from every other by a small number of hops or steps. A category of small-world networks was identified as a class of random graphs by Watts and Strogatz (1998). A 'scale-free' ideal network is a type of random network. The mostly widely known generative model for a subset of scale-free networks is identified by Barabási and Albert (1999). In scale-free networks, the major hubs are closely followed by smaller ones and they are, in turn, followed by other nodes with an even smaller number of links and so on. This hierarchy allows for a fault tolerant behaviour. 'Core periphery networks' consists of a core with a set of central nodes that are well-connected with each other, and also with the periphery and peripheral nodes that are connected to the core, but not to each other. Such networks are known to be efficient spreaders of knowledge. Core nodes in networks are found to be more powerful whereas periphery nodes are found to have little power. Watts (1999) and many others have noted that in large, real-world

networks there is often a structural tendency towards dense local neighbourhoods or 'clustering'.

2.4.2 Types of Networks

Networks can be categorized based on the number of node types it has. 'Single mode networks' involve relations among a single set of similar actors, such as information exchange among physicians within a hospital. 'Two-mode networks' involve relations among two different sets of actors. An example would be the analysis of a network consisting of private, for profit organizations and their links to non-profit agencies in a community. Two mode networks are also used to investigate the relationship between a set of actors and a series of events. For example, unknown people may attend common events in a community, opening the opportunities for the formation of 'weak ties.' Krackhardt and Carley (1998) introduced 'meta-networks' (multi-mode networks) with the PCANS Model, introducing the concept that networks occur across multiple, interrelated domains including entities such as Individuals, Tasks, and Resources. In other words, a meta-network is a set of interconnected networks, which consists of multiple types of nodes and links (Carley 2003, Prestov 2009). Meta-network encompassing multiple homogeneous networks into a larger heterogeneous network with different kinds of nodes and relationships are amenable to analysis with the support of computer-based tools, such as ORA (Carley 2003, Carley and Reminga 2004).

Networks can be categorized based on the scope of network considered. As such, SNA involves relational datasets. There are two basic kinds of network analysis, reflecting two basically different kinds of data: 'ego network analysis', and 'complete network analysis' (Provan, Fish et al. 2007). A complete network consists of the relational ties among all members of a community. Complete network analysis involves all the relationships among a set of respondents. Techniques such as subgroup analysis, equivalence analysis and measures like centrality can be conducted on complete networks. Saturation surveys are used to map complete or whole networks. Relevant relational data are collected from each actor in the network allowing a complete analysis of network relations and the embedded resources. For small networks (50

actors or less), each actor can be provided with a list of all actors in the network and asked to indicate those with whom she or he has a particular relationship (or strength of the tie with each). For large networks, each actor can be asked to identify his relations within the network. This is known as 'ego-networks' where any focal node is referred to as an 'ego'. Ego-centric or personal networks are defined from a focal actor's standpoint. This refers to the ties directly connecting the focal actor (ego) to others (alters) in the network, plus ego's views on the ties among his alters. Typically, the analysis of ego-networks involves assessing the quality of a person's networks (size etc.). In ego-centric network studies, name generators and position generators can be used for data collection. Name generators involve asking a focal actor for the names of people to whom he is connected in a particular way. Position generators are used to identify people who are in valued positions such as physicians, or politicians who have entree to a variety of resources such as information, skills (Van der Gaag, Snijders et al. 2008, Lin and Erickson 2010). The actors are asked if they know anybody in such roles. Ego network analysis can be used with random sampling, which enables standard statistical techniques to be used to test hypotheses.

2.4.3 Network Measurements

To understand networks and their participants, certain properties of networks or locations of actors can be evaluated. These measures provide insight into the various roles and groupings in a network such as 'who are the connectors, mavens, leaders, bridges, isolates', 'where are the clusters and who is in them', 'who is in the core of the network, and who is on the periphery?' Network analysis in the basic form involves relational datasets. Relational data are represented as nodes and links that connect the nodes. Moreover, nodes and links can have weights, attributes and types or directions. Nodes can represent instances of entities such as 'agents' and links can represent instances of relations such as 'collaboration' or 'communication' (Wasserman and Faust 1994, Carley 2002).

In order to allow meaningful analysis, data need to be transformed into information and then to knowledge (Parastatidis, Viegas et al. 2009). Transforming relational data into network data requires additional data (Alderson 2008) such as attributes of nodes

or links (Krackhardt 1987) that are generally referred to as meta-data. Commonly used attributes involve temporal and spatial information (Snijders 2001, Eagle and Pentland 2006). To derive meaningful insights leading to building and testing theories, computational network measures based on proven theories can be helpful (Corman, Kuhn et al. 2002). SNA provide theories, models and methods for working with network data (Carrington, Scott et al. 2005).

Measurements of networks are varied according to the type of viewpoint: ego-centric network viewpoint the whole network viewpoint (Kilduff and Tsai 2003, Provan, Fish et al. 2007). In actor-centric perspective, measuring the actor's network location generally involves finding the centrality of a node. Centrality measures identify the most prominent actors, that is those who are extensively involved in relationships with other network members (Freeman 1978, Freeman, Roeder et al. 1979). In general, Centrality indicates one type of importance of actors in a network. Properties such as degree of clustering, degree of boundary spanning potential, degree of structural holes can be measured from both ego-centric and whole network perspective. Cohesion describes the interconnectedness of actors in a network. It can be measured in several ways such as; Density, Distance between two nodes known as 'Degrees of separation' (Guare 1990), or Reachability (whether actors within a network re related, either directly or indirectly, to all other actors) (Doreian 1974**).** Density of a network is the total number of relational ties divided by the total possible number of relational ties.

Subgroup measures show how a network can be partitioned. A component is a portion of the network in which all actors are connected, directly or indirectly, by at least one tie. By definition, each isolate is a separate component. A clique is a subgroup of actors who are all directly connected to one another and no additional network member exists who is also connected to all members of the subgroup (Luce and Perry 1949). Subgroup detection has been an important element in diffusion studies (e.g. Hunter, Vizelberg et al. 1991). The main network theory used in these studies is 'the strength of weak ties' (Granovetter 1973). This theory proposes that information spreads rapidly through densely knit subgroups. However, groups can get access to new information through links with external connections, which are likely to be weak. One

of the most well-known network experiences, the small world phenomenon (de Sola Pool and Kochen 1978) which combines the notions of connectivity and subgroup clustering. A small world graph is formalized as a sparse network that is highly clustered, containing a large number of actors, none of whom are dominant (Watts and Strogatz 1998). The following table 2.6 summarizes a range of network measures identified in literature. The network concepts and measurements used in this study are discussed in detail in the section 3.3.3.

Table 2.6 : Summary of Network Measurements

Measure	Reference	Description	Input
Betweenness centrality	Freeman, 1978	Across all node pairs that have a shortest path containing v, the percentage that pass-through v.	Square Node Level Matrix with data type = binary
Closeness centrality	Freeman, 1978	The average closeness of a node to the other nodes in a network.	Square matrix with data type = binary.
Eigenvector centrality	Bonacich, 1972	Calculates the principal eigenvector of the network. A node is central to the extent that its neighbours are central	Square Agent by Agent Node-level matrix with data type = real and Non-Directed
Degree centrality	Wasserman, and Faust, 1994	The Total Degree Centrality of a node is the normalized sum of its row and column degrees.	Square Agent by Agent Matrix with data type = real.
In-Degree centrality	Wasserman, and Faust, 1994	For any node, the in-links are the connections that the node of interest receives from other nodes.	Square Agent by Agent Matrix with data type = real.
Out Degree centrality	Wasserman, and Faust, 1994	For any node, the out-links are the connections that the node of interest sends to other nodes.	Square Agent by Agent matrix with data type = real
Boundary spanning potential	Cormen, Leiserson, Rivest, Stein, 2001	Nodes that are connecting disconnected groups.	Square matrix with data type = binary and Non-Directed

Clique Count	Wasserman, and Faust, 1994	The number of distinct cliques to which each node belongs	Square matrix with data type = binary.
Burt Constraint (Structural holes)	Burt, 1992	The degree to which each node in a square network is constrained from acting because of its existing links to other nodes.	Square matrix with data type = real.
Effective network size (Structural holes)	Burt, 1992	The effective size of a node's ego network based on redundancy of links.	Square matrix with data type = real.
Watts-Strogatz Clustering Coefficient (Ego network density)	Watts, Strogatz, 1998	Measures the degree of clustering in a network by averaging the clustering coefficient of each node, which is defined as the density of the node's ego network	Square matrix with data type = binary
Density	Wasserman, and Faust, 1994	The ratio of the number of links versus the maximum possible links for a network.	Unimodal matrix with data type = binary.

2.4.4 Social Capital and Network Approach

Network theory provides the helpful canvas to formulate and validate social capital theory. In simple terms, "*social capital is about the value of connections*" (Borgatti and Foster 2003: 993). How much a person can get from his social network largely depends on his network position. There has been a school of literature that focuses on aspects related to network structure of social capital. This school was pioneered by Granovetter (1973) and many authors have contributed afterwards (e.g. Burt 1992, Burt 1997, Portes 1998, Lin 1999, Lin 2001).

Social capital is viewed as the aggregate of the actual or potential resources linked to an individual through his social relations (Bourdieu 1986). As Lin (1999) suggests, the network theory of social capital is based on the fundamental understanding that social capital is captured from embedded resources in social networks. This concept of social capital simply suggests that network ties are resources (Coleman 1990); and

that networks can be viewed as the opportunity through which entrepreneurs obtain information, resources and social support (Brüderl and Preisendörfer 1998, Prevezer 2001, Tan-Torres Edejer, Acharya et al. 2003). In business contexts, as shown by Wu (2008), social capital can be conceptualized as a resource that can contribute to firm performance.

Network ties can provide an individual with useful knowledge about opportunities otherwise not available, and those network ties may prompt awareness in an organization and its members of the availability of such knowledge resources (Lin 2001). Network ties may also influence decision-making and strategic choices, based on the location of actors within a network (Burt 2005). Further, while the social credentials of an individual reflect the individual's social standing (Lin 1999), network members may seek to acquire such credentials by forming alliances with such individuals. Social ties can characterize social capital as ties to resource-filled others (Borgatti and Foster 2003) and therefore can reinforce identity and recognition, and be used to gain public acknowledgement of the actor's claim to resources (Lin 1999).

Basic indicators of social capital are linked to structural properties of social networks. The presence or absence of a tie between a pair is considered is viewed a resource for the actor that gives him access to the network. If we are considering directed relations, the extent of 'reciprocated' ties may indicate the degree of cohesion, trust, and social capital that is present. A triad represents the smallest social structure that has the true character of a society. Analysis of directed triads, enable to observe the propensity towards the consistency of social structures (balance and transitivity). Most people interact with a fairly small set of others, many of whom know one another. The extent of local clustering in populations can be quite informative about the quality of everyday life. Actors may be embedded in social units defined by shared attributes or shared membership. Some network structures are particularly advantageous for certain functions (Hawe, Webster et al. 2004). For example, dense networks are good for coordination of activity among the actors due to pre-existent awareness among members. There are many and interesting approaches to characterizing the extent and form of embedding of actors in populations.

A famous argument in network science is built around ‘structural holes and ‘network closure’. Ronald Burt presented an interesting argument to the social capital theory. Burt (1992) used the term ‘structural hole’ to refer to a gap between two nodes or two groups with complementary resources or information. When the two are connected through a third node, it creates important entrepreneurial advantages for the third node. Burt argued that the networks with more structural holes are beneficial to its occupants as it carries more brokerage opportunities to explore. The structural hole argument states that social capital is created by a network in which people can broker connections between otherwise disconnected segments (Burt 2001). It is believed that social capital is more a function of brokerage across structural holes than closure within a network (Burt 2000). However, Coleman (1988, 1990) presented the ‘network closure argument’ by identifying the risks associated with being a broker. Coleman stresses that the networks with closure where everyone is connected such that no one can escape the notice of others, are the source of social capital.

2.4.5 Network Approach and Study of IOR

A web of relationships is referred to as a ‘network’ (Bøllingtoft and Ulhøi 2005). Networks are increasingly seen as an optimal structure for conceptualizing groups or organizations aiming to work collaboratively (Borgatti and Halgin 2011). As pointed out by Borgatti and Foster (2003), social network research in management has increased rapidly in many disciplines. Network studies in business management are concentrated in the areas of strategic management, competitive advantages, relational management, organizational characteristics, administration, and organizational development and mainly deal with long-term relationships between companies (Witt 2004). In these studies, the organizations are modelled as nodes, and exchanges between them are represented by the connecting lines. This area of study encompasses not only network structures, relations and outcomes, but also individuals and their attributes (Parkhe, Wasserman et al. 2006) .

IOR research on networks can be categorized along two dimensions: the independent variable being utilized for the study and the dependent or outcome variable (Provan, Fish et al. 2007). Proven at el. (2007) take a whole network perspective for studying the impact of multi-level actions and structures on network level outcomes.

Researchers have studies firm characteristics that drive IORs such as alliances and partnerships (Gulati 1995). Moreover, some studies have investigated the impact (e.g. organizational learning or innovation) of network structures and behaviours on individual organizations (Powell, Koput et al. 1996, Walker, Kogut et al. 1997, Ahuja 2000, Bell 2005). Certain structural properties of networks have attracted scholars' attention. Brewer (2003) argued that denser networks increase the likelihood that people will engage in collective action. In closed networks, information about one actor's opportunistic acts diffuses rapidly to other actors, and opportunistic behavior is less likely because of the threat of reputation loss (Walker, Kogut et al. 1997). Such social conditions associated with dense networks can facilitate large relationship-specific investments that help maximize the benefits from collaboration and foster the development of shared norms of behavior and explicit inter-organizational knowledge-sharing routines (Walker, Kogut et al. 1997). A longitudinal study of international chemicals industry identified that increasing structural holes has a negative effect on innovation in inter-organizational collaboration networks and that the structure of inter-organization networks depends on the objectives of the network members (Ahuja, 2000). Another longitudinal study suggests that organizations in alliance networks that exhibit both high clustering and high reach will have greater innovative output (Schilling and Phelps 2007). Few researchers (Uzzi 1997, Sydow and Windeler 1998) have studied how organizations and their movements affect network stability, and effectiveness.

Several researchers have recently used network theory to investigate separate aspects of inter-bank markets. Exploring the network topology of the inter-bank payments, Soramäki et al. (2007) find that the network includes a tightly connected core of money-center banks to which all other banks connect and that the properties of the network changed considerably in the immediate aftermath of the attacks of September 11, 2001. On the other hand, by studying the network structure of the lending market which appeared to be a core-periphery model, Craig and Peter (2014) provided evidence that inter-bank markets are tiered in the sense that the banks lend through money-center banks acting as intermediaries. Li and He (2012) studied the resilience of inter-bank market networks to shocks, and reveals that the scale-free networks have the highest stability against shocks, while small-world networks are the most vulnerable. However, Georg (2010) studied contagion effects from the default of a

large bank in different network topologies. The results indicated that contagion is more severe in random and scale-free networks than in small-world networks. Further, this situation changes when the central bank is not active in which case small-world networks are less stable than scale-free and random networks. An experiment conducted by Krause and Giansante (2012) provided evidence that capital and cash reserves of banks play an important role in the ease with which failures spread in the banking network. They also provided evidence that the degree of reliance on inter-bank loans as well as the degree of connectivity is associated with the spread of failures. In an empirical analysis of how the network structure affects stability of the Austrian interbank market, (Boss, Elsinger et al. 2004) interpreted interbank market as a network where the banks as nodes liabilities between them as edges and identified structural features similar to other complex real world such as low clustering and relatively short average shortest path length. Moreover, they find that there are very few banks with many interbank linkages whereas there are many with only a few links. They used different network measures to investigate the empirical network structure of the Austrian banking system.

2.4.6 Network Measures of Social Capital

In the area of organizational network research, social capital has become a key area of interest (Borgatti and Foster 2003). Network studies of social capital can be categorized based on the unit of analysis and form of social capital (Borgatti and Everett 1998). In a review of social capital studies, Acquaah at et (2014) presented a 'Model of Social Capital Measurement', distinguishing between the form (internal versus external); type (structural, relational, and cognitive), and levels of analysis (individual, or collective) of social capital. An integrated classification of both of the above views is presented in the figure 2.2. There are differences in the indicators that should be emphasised when measuring each type. The definitions for each box is given thinking of a 'community' as a social unit. However, it can be replaced by units such as 'individual', 'group', 'team', 'firm', 'industry' or 'nation'.

		Type of Focus for Measurement	
		Internal	External
Nature of Social Capital	Individual (or firm) level resource (private-good)	Box 1 INTERNAL MEASURES FOR INDIVIDUAL ACTORS • When community members have strong ties within the community, it's an internal resource of that community as a unit. • Focus on properties of internal network (e.g. network cohesion) and level of trust and shared norms among members of a firm, to measure individual social capital linked to firm-level benefits.	Box 2 EXTERNAL MEASURES FOR INDIVIDUAL ACTORS • When community members have strong ties with other communities, it's an advantage for that community. • Focus on node level network measures in the inter-organizational external network to measure individual social capital of a firm; (Ego-network measures, Structural hole measures, centrality measures).
	Collective resource (public-good)	Box 3 INTERNAL MEASURES FOR COLLECTIVE ACTORS • When community members have strong ties within the community, its beneficial to everyone in that community. • Focus on properties of internal network (e.g. network cohesion) of a firm, to measure collective social capital.	Box 4 EXTERNAL MEASURES FOR COLLECTIVE ACTORS • When community members have strong ties with other communities, its beneficial to all communities. • Focus on properties of external network (group centrality measures) among organizations (or units) as a collective resource for the industry.

Figure 2.2 : Different Measurements of Social Capital

The boxes 1 and 2 both correspond to the 'individualist' view of social capital that Putnam describes as the 'private-good' facet of social capital. The boxes 3 and 4 both correspond to the 'public-good' perspective of social capital.

Box 1 focus on 'internal social capital of individuals or organizations'. In the case of individuals, it is possible to identify it as 'human capital' (Borgatti and Everett 1998).

When focusing on organizations as units, a firm's social capital can be viewed as derived from internal social cohesion and it is viewed as a firm-level competitive advantage. Measures of overall structure of firm's internal network such as cohesion, and ties (bonding and linking), level of trust and shared norms, values and goals among members are used to measure social capital of the firm.

Box 2 corresponds to the category of studies that focus on 'externally derived social capital of individuals or organizations' (Lin and Dumin 1986, Brass and Burkhardt 1992, Burt, Nohria et al. 1992, DiMaggio 1994, Gulati 1999). In the case of individuals, studies focus on bridging ties to non-similar others where as in the case of organizations, the focus is on firm's bridging and linking ties with other organizations and stakeholders. Such ties are viewed as the social capital and a source of competitive advantage for the firm. According to Acquaah at el. (2014), when the focus is external, the measures to use at individual and firm-levels of analyses are network structure, network ties (bridging and linking), and trust. The measures used in this category is discussed in more details in the section 2.4.6.1.

Box 3 corresponds to 'groupist' school known as the 'collective-good' facet. It refers to the 'characteristics of internal network of a community or firm'**.** In studies of individuals, the focus is on bonding and linking ties within the community. When focusing on organizations, the focus is on bonding and linking ties within the firm that is considered a resource of the collective. Measures of trust, civic norms, association membership and community engagement are commonly used in this category. This is the underlying conception found in Putnam, Bourdieu, and most of Coleman. Studies in this category generally rely on internal measures of network cohesion such as Density, Centralization and Average Distance.

Box 4 is largely focused in the context of links among the teams within a firm. Ancona (1990) has suggested that teams whose members have strong ties with the rest of the firm are more successful in getting things done. Similarly, Cohen and Levinthal (1990) suggest that ties to outsiders help organizational teams to innovate as a whole. At a higher level, studies focus on inter-organizational links that enable overall sustainability or development of the industry. Measures appropriate for measuring this

kind of social capital have appeared in the social network literature as measures of group centrality such as group degree, group closeness and group betweenness (Everett and Borgatti 1999).

However, in a systemic review of social capital studies at the individual, firm and community levels, Acquaah at et (2014) suggests that the measurements vary starting from the level of individuals. At the individual level, responses of individual within a group, an organization, or a community are considered. At the firm-level, an individual top executive response or an aggregate of the top management responses are collected. At the community level, an aggregate response of individuals in a community or nation is used.

2.4.6.1 Network Measurements Applicable in this Study

Perspectives that focus on organizations as actors (i.e. ego-centric) are trying to explain how the involvement ofan organizationin a network affects its actions and outcomes. Some ego-centric theories focus on the 'embeddedness' of organizations in a network (Uzzi 1999, Ahuja 2000). Such research often use structural and positional measures. The external network measures of individual actors commonly used in the studies in this category include ego-network measures (size, degree, density), centrality measures (closeness, betweenness, eigenvector) and measures of structural holes (such as effective network size) (Borgatti and Everett 1998).

A summary of popular network measures of external individual social capital is given in the tables 2.7, 2.8 and 2.9. These are extracted from review of Borgatti and Everett (1998). When relating this knowledge to the study context, note that the term 'ego' refers to the firm whose social capital is being measured, and 'alter' to mean the other organizations that the ego is directly connected to. The column labelled 'relation to social capital' insights on how the network variable is related to social capital.

Table 2.7 : Ego-Network Measures for External, Individual Social Capital

Name:	Description	Relation to Social Capital
Size / degree (Burt, 1983)	The number of alters that an ego is directly connected to,	Positive. The more people you have relationships with, the

	possibly weighted by strength of tie.	greater the chance that one of them has the resource you need.
Density (Burt, 1983)	The proportion of pairs of alters that are connected.	Negative. If all your alters are tied to each other, they are redundant. Given limits on relational energy, need to put eggs in more than one basket.
Heterogeneity* (Burt, 1983)	The variety of alters with respect to relevant dimensions (e.g., sex, age, race, occupation, talents).	Positive (except when it conflicts with compositional quality)
Compositional Quality*	The number of alters with high levels of needed characteristics (e.g., total wealth or power or expertise or generosity of alters)	Positive. The more connected to useful others, the more social capital.

*Requires attribute data on all nodes in addition to relational data.

The next set of measures are the structural hole measures proposed by Burt (1992). Table 2.8 shows only the basic categories.

Table 2.8 : Structural Hole Measures for External, Individual Social Capital

Name	Description	Relation to Social Capital
Effective Size (Burt 1992)	The number of alters, weighted by strength of tie, that an ego is directly connected to, minus a 'redundancy' factor.	Positive. The more different regions of the network an actor has ties with, the greater the potential information and control benefits.
Constraint (Burt 1992)	The extent to which all of ego's relational investments directly or indirectly involve a single alter	Negative. The more constrained the actor, the fewer opportunities for action.

The third set of measures includes the standard centrality measures. These differ from the ego-network measures as they require that the entire network to be measured. Hence, they are better measures of a node's position in the network, but require much

more complicated data as input. Table 2.9 presents just a few of the more well-known measures.

Table 2.9 : Standard Centrality Measures for External, Individual Social Capital

Name:	Description	Relation to Social Capital
Closeness (Freeman 1979)	The total graph theoretic distance from ego to all others in network.	Negative. The greater the distance to other nodes, the less the chance of receiving information in a timely way.
Betweenness (Freeman 1979)	The number of times that ego falls along the shortest path between two other actors.	Positive. Actors with high betweenness link together actors who are otherwise unconnected, creating opportunities for exploitation of information & control benefits.
Eigenvector (Bonacich 1972)	The extent to which ego is connected to nodes who are themselves high in eigenvector centrality.	Positive. An actor has high eigenvector scores when they are connected to well-connected others.

2.5 Information and Communications Technologies (ICT)

2.5.1 ICT and Social Capital

With the advancement of ICT, the interactions between ICT and social capital in the organizations and society have drawn both researchers' and policymakers' attention. IS researchers have increasingly become aware of the important role of social capital in technology development and knowledge sharing (Fountain 1997, Riemer 2004, Syrjanen and Kuutti 2004). At the same time, others argue that ICT, such as the Internet, facilitate social capital building (Hampton and Wellman 2003). In a review of studies that focus on the link between social capital and ICT, Yang et al. (2009) identified four main categories depending on direction of relationships between ICT and Social capital and the focus of individual or collective forms of social capital. Since social capital is expected to be beneficial to both individuals and collectives, interactions between social capital and ICT take place at both levels. To enhance our knowledge in this area, this study further explores the relationships between different dimensions of social capital and ICT using empirical evidence from the banking industry.

2.5.1.1 ICT's effect on Social Capital

Research using social capital as a dependent variable explores the role of ICT in social capital building and maintenance. Some studies show that the spread of ICT creates networking infrastructure, encouraging the formation of social capital (Clark, Partridge et al. 2003, Pierce and Lovrich 2003). Pierce and Lovrich Jr. (2003) study the relationship between Internet use and social capital in forming social and personal trust. According to Clark (2003), the Internet 's potential for growing social capital, may lie in the public locations that enable its use than in the technology itself. Some studies have reported the positive role of ICT in the building of social capital for community development. It reveals the positive social impacts of Internet use on relationships within neighbourhoods (Wellman, Haase et al. 2001, Hampton and Wellman 2003, Hampton, Lee et al. 2011). The link between the use of social network services and social capital has also been investigated. Sites such as Myspace,

Facebook, and LinkedIn allow individuals to establish or maintain connections with others. Ellison et al., (2007) discovers that there is a strong association between the use of Facebook and the formation and maintenance of social capital. Technology-mediated interactions, such as the use of social network sites, may provide users with an opportunity for the creation of 'virtual‖ social capital' that opposes but also complements real social capital developed offline (Alessandrini 2006).

There is also evidence that ICT may negatively influence society. While the use of ICT for communication usually enhances cooperation and collective action, ICT-based entertainment may lead people to increased disconnection from the real world (Rheingold 2001, Srivastava 2005). Loch and Conger (1996), argue that ICT uses such as the interactions via computers, can cause feelings of being separated from others that can lead to violations of norms of appropriateness. Many of the early studies of ICT and Social capital focus on the effects of TV and the Internet on collective social capital. However, only few of these studies support Putnam 's view that television in America has contributed toward the erosion of social capital and civic engagement (Norris 1996, V. Shah 2001). Contrary to predictions that Internet use would encourage social isolation, the Netville experiment of Hampton and Wellman (2003) showed that Internet use resulted in greater civic involvement and neighbourly contact. Some government agencies highlight that it is necessary to investigate the role of ICT in the building of social capital because of its benefits, such as the reduced need for personal security and improved workplace efficiency (UNCTAD 2005). The specific effects of ICTs on different dimensions of social capital is discussed in the Chapter 3 of this thesis.

2.5.1.2 Social Capital's Effect on ICT

Studies treating social capital as an independent variable examine the effects of social capital on the development and use of ICT. Some of these studies regard the effects of social capital on individual's acceptance and usage of ICT (Venkatesh, Morris et al. 2003, Kvasny and Keil 2006), whereas other studies regard the effect of social capital towards overall ICT diffusion in communities (Fountain 1997, Borgida, Sullivan et al. 2002). Some studies demonstrate that a high level of already established social capital, such as pre-existing, strong, non-electronic networks and community commitment, is

a factor for success in establishing electronic networks (Fukuyama 1995, Borgida, Sullivan et al. 2002). Authors have also attempted to understand the formulation of ICT policy through online social discussion forums, especially in developing countries (Kendall, Kendall et al. 2006).

Some studies have noticed the influence of social norms on ICT adoption (Loch and Conger 1996, Venkatesh and Davis 2000, Venkatesh, Morris et al. 2003). The influence of social factors is defined, as the degree to which an individual perceives that others expect him to adopt information technology (Venkatesh, Morris et al. 2003). In the Innovation Diffusion Theory (Rogers 2003), communication channel is found to be an important factor for potential users in adopting a technology. Researchers confirm that social capital has a positive role in technological innovation (Spence and Schmidpeter 2003, Steinfield 2004). Riemer and Klein (2004) identify the challenges of ICT enabled virtual organizations and argue that, without social capital, collaboration in virtual organizations is unlikely to succeed.

Fountain (1997) maintains that social capital is a necessary factor in enabling effective partnerships for technology innovation. Some studies explore the role of social capital in relation to various forms of virtual organizations enabled by ICT and e-commerce in an organizational context (Nahapiet and Ghoshal 1998, Arenius 2002, Spence and Schmidpeter 2003, Steinfield 2004). On the other hand, existing relationships between partners can both enable and constrain the effect of IT on inter-organizational collaboration (Chae, Yen et al. 2005).

2.5.2 ICT and IOC

The advances in ICTs, have transformed inter-organizational collaborations. New paradigms such as virtual communities represent the temporary alliances of entities that come together to share skills, competencies and resources in order to better respond to business opportunities. However there exist a number of fundamental hurdles in the journey of inter-organizational collaborations such as interacting and information sharing across space and time. ICT comes as the liberator that allow organizations to establish ways to connect across these boundaries.

There have been a number of studies of ICT's effect on inter-organizational relationships (Carr and Smeltzer 2002, Grover, Teng et al. 2002). In these studies, ICT acts as an important factor for collaborative relationships. While many of these studies focused on different forms of ICTs, most of them identified positive effects of ICTs on inter-organizational collaboration (Chae at el 2005). Several studies suggest that success of buyer-supplier relationships are associated with high levels of information sharing and communication (Mohr, Fisher et al. 1996, Cannon and Perreault Jr 1999). Many scholars believe that ICTs can increase the information processing, thus enabling greater interfirm cooperation and reduced uncertainty (Bensaou 1997, Subramani 2004). The use of IT may leverage and reinforce existing partnership characteristics such as trust (Handfield and Bechtel 2002). Stump and Sriram (1997) provide evidence that the use of ICT is associated with the overall closeness of buyer-supplier relationships. For example, Electronic data interchange (EDI) is positively related with buyer-supplier relationships (Sriram and Banerjee 1994, Vijayasarathy and Robey 1997). Grover et al. (2002) show that ICT decreases transaction costs between parties and creates a more cooperative governance structure.

On the other hand, a small number of studies have reported no association or no change in the buyer-supplier relationships with IT implementation (Jayaram and Vickery 1998, Larson and Kulchitsky 1999). In a study by Carr and Smeltzer (2002), several interviewees held that the use of IT may decrease trust-based inter-organizational partnerships as trust is built on human interaction.

2.6 Research Gap

2.6.1 The Line of Inquiry and Call for Research

Building on Moran and Ghoshal's (1996) formulation of value creation as arising from the combination and exchange of resources, Nahapiet and Ghoshal pioneered the identification of structural, relational, and cognitive dimensions of social capital and its value creation at the firm-level. They explained how features of three dimensions of social capital facilitate the combination and exchange of resources within organizations. The following figure 2.3 presents an abstract view of this concept.

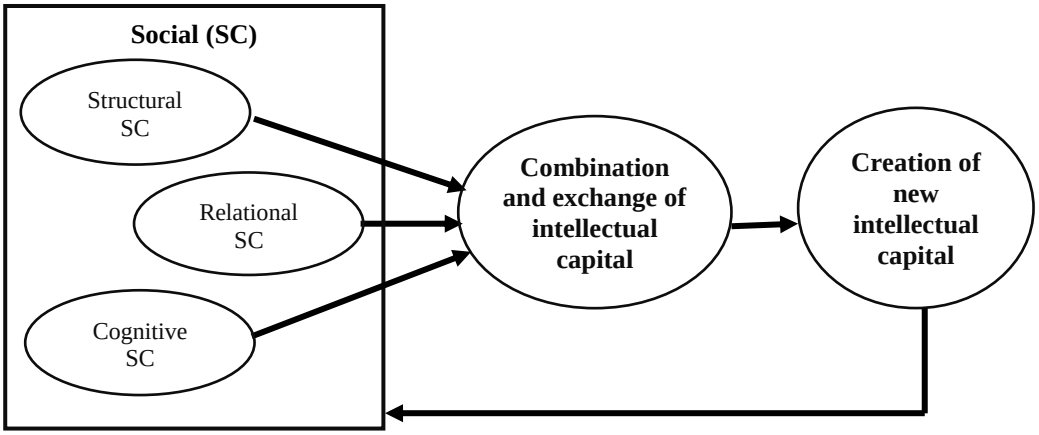

Figure 2.3 : Theoretical Framework Proposed by Nahapiet and Ghoshal (1997)

Subsequently, Tsai and Ghoshal (1998) studied the resource exchanges among 15 business units in a large multi-national electronics company and found empirical support for Nahapiet and Ghoshal's proposals about positive association between social capital and organizations value creation through resource exchange and combination. They suggested that future research should investigate different types of value creation outcomes of social capital such as inter-organizational strategic alliances. An abstract view of their findings is presented in the figure 2.4. They suggested that future research could extend this work by investigating other types of innovation or more broadly defined value creation activities. Moreover, they suggested that future research could apply their research design to inter-organizational settings such as strategic alliances or buyer-supplier networks and that intra and inter-organizational comparison of the formation and maintenance of social capital may yield some interesting findings and help further elaboration of the underlying theory.

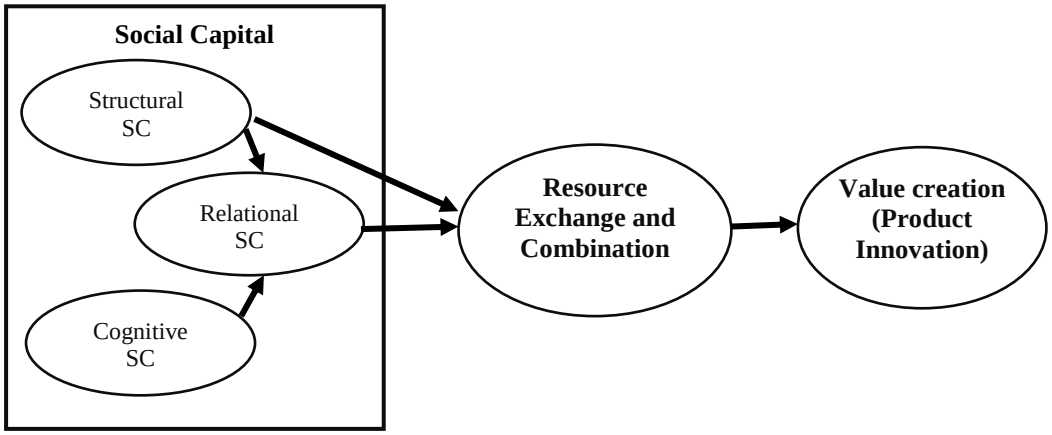

Figure 2.4 : The model quantitatively tested by Tsai and Ghoshal (1998)

This line of inquiry has been further encouraged by other researchers. Reviewing literature on social capital and IOR, Nahapiet (2008) suggested that social capital could be a valuable tool in explaining '*why some organizations do better in IORs?*' especially in the areas of 'Partner selection' and 'Performance or success of IORs'. In the domain of IOR, Gulati (1995) emphasized the importance of social networks in inter-organizational alliance formation. In a study of investment banks in US, Chung (2000) identified that banks' resource complementarity, status similarity and social capital in terms of prior alliances and reciprocity in opportunity exchange are important factors positively influencing alliance formation between organizations. Moreover, Tabbaa and Ankrah (2016) reveal that social capital is a useful tool in facilitating University-Industry collaborative relationships in the UK.

2.6.2 Summary of Knowledge Gaps

Majority of studies that examined social capital in the inter-organizational contexts, is focused on the collective perspective of social capital. There is also a sub-stream known as 'collaborative networks' (Macke and Dilly 2010). These studies set out to measure the existing levels of collective social capital within the collaborative networks of certain collaborative industries and do not consider on the individual nature and the multi-dimensional nature of the concept. In addition, most of the existing literature on IOR that uses social capital as an independent variable, focus on strategic alliances and partnerships focused on traditional industries (e.g. agriculture

or manufacturing or supply chains of steel industry and bio-technology industry) (Anderson and Narus 1990, Sciascia and Mazzola 2008). In these studies, researchers focus on indicators such as previous partnerships, managerial contacts, or network centrality in attempt to explain more critical questions such as '*why an organization ally with certain organizations?*' and '*why some organizations do better in inter-organizational relationships than others?*'. In addition, previous empirical studies have only focused on large, multinational firms by studying special types of collaboration (e.g. joint ventures), using the databases of big firms, or adopting only financial returns on investment (ROI) as indicators of collaboration performance (Anderson 1990, Indro and Richards 2007). The majority of firms, micro and small firms, have not received enough attention in the previous literature (Lee 2007).

Many of the studies of social capital and IORs do not capture the multi-dimensional nature of social capital and only consider on one or two features as indicators of social capital. The studies that attempted to investigate the inter-relationships between structural, relational and cognitive dimensions of social capital were not focused at the inter-organizational level (Tsai and Ghoshal 1998; Zheng 2010). Only a few studies examined the concept in contexts such as buyer-supplier relationships (Roden and Lawson 2014) and university-industry collaborations (Bstieler et. Al. 2015; Tabba and Ankrah 2016). The findings of these studies regarding the interrelations among dimension were not consistent and appear to be context specific. However, the multi-dimensional nature of social capital in the inter-bank context remains completely untapped. This leaves a knowledge gap in the area of multi-dimensionality of social capital in the inter-bank context.

Nevertheless, most empirical research on inter-firm collaboration has focused on the developed contexts such as the U.S., Japan, European countries and Australia (e.g. Hagedoorn 1993, Gulati 1995, Kale and Singh 1999, Hagedoorn and Duysters 2002, Lohrke, Franklin et al. 2006), while only a little research have been conducted in developing countries (e.g. Humphrey and Schmitz 1998, Narteh 2008). Most of the existing literature focus only on firms from developed countries (Lavie 2007). It is possible that there could be differences in the characteristics of inter-firm collaboration between developed and emerging regions. For example, different cultures may have

different attitudes to trust (Vilana and Monroy 2010). Trust is believed to play a more important role in business dealings in East Asia (Boisot and Child 1988). Intangible benefits such as 'Guan Xi' play a vital role in Chinese inter-firm collaboration (Lu and Yao 2006, Su, Yang et al. 2009, Jia and Rutherford 2010). In developing countries, the relationship with government is seen as an important indicator of a firm's competitiveness in some developing countries (Lu and Yao 2006). It is also noted that due to resource differences, smaller firms from developing countries tend to collaborate with larger firms from developed countries (Narteh 2008). The levels of laws and regulations in developing countries are different from developed contexts. Intellectual property protection problems in developing countries are often mentioned by multinational firms (Indro and Richards 2007). Thus, there is a need for further and more detailed studies that examine inter-firm collaboration from a comparative industry and country perspective.

Although many studies have looked at inter-bank networks in IOR literature (Uzzi 1999, Boss, Elsinger et al. 2004, Nier, Yang et al. 2007, Allen and Babus 2008), they merely attempt to model inter-bank lending interactions to investigate resilience to failure and the contagion effect. Relatively few studies have examined alliance formation in the banking industry (Simons 1993, Chung, Singh et al. 2000, Wright and Lockett 2003, Champagne and Kryzanowski 2006). While Champagne and Kryzanowski (2006) examined the impact of past syndicate alliances on the consolidation of financial institutions, both Chung et al. (2000) and Simsons (1993) focused on identifying drivers of alliance formation in US investment banks. Simsons found that loan syndications are driven primarily by the lead bank's capital consideration while Chung et al. found status similarity and social capital has a strong effect on alliance formation. Wright and Lockett (2003), analysed the structuring and management of syndicated alliances in venture capital industry from the perspectives of lead and non-lead members and emphasize the importance of non-legal sanctions and reputation effects, in mitigating opportunistic behaviour by dominant equity holders and highlight the role of repeated syndicates.

However, while none of these studies investigated the barriers to inter-bank alliance formation, most importantly the effect of social capital in resolving them remains

unexplored in the context of inter-bank context. As the results from developed countries are not generalizable to other contexts, there is a gap of understanding on the matter from the perspective of developing contexts. Moreover, no research has been published detailing the effect of specific effects of multiple dimensions of social capital on the inter-bank collaboration. Financial industry is inherently networked and involves dealing with high risks. It is pertinent to understand '*why certain banking organizations do better in IOR than others*?' especially in developing contexts. As inter-firm collaboration involves dynamic activity, an important issue is the identification of how such collaboration is driven in critical contexts such as the finance industry.

Moreover, the link between ICT and social capital also remains unclear. While social capital is a multi-dimensional concept that operate in different levels of social units, literature provide no evidence on the interactions between social capital and ICT may vary accordingly. However, literature provide no evidence of research investigating the specific effects of ICTs on different dimensions of social capital. This implies that there is a lack of agreement between the direction of causality and the findings also vary according to the particular type or aspect of technology being focused. To enrich the existing knowledge in this area, further investigations should be carried out exploring the relationships between different dimensions of social capital and ICTs.

2.6.3 Conclusion and Research Questions

A few key points need to be highlighted from the above line of review. Leading scholars of social capital have identified a need for future studies of social capital to be focused on inter-organizational relations. Although a number of researchers have attempted to investigate different aspects of social capital in intra-firm and inter-organizational environments, none of them encapsulated the holistic effect of all three dimensions of social capital on IOR. While they did not explain the mechanism in which different aspects of social capital may cause this effect, nor did they capture the effects of other critical factors that may strengthen or impede this effect of social capital. Up to date, there is no clear understanding on how ICTs may influence the effects of different dimensions of social capital on IOR. Moreover, there is lack of

understanding on the topic from emerging contexts whereas the vast majority of evidence were from developed countries. While the strategic alliances in developing context remain largely unexplored, the alliances in finance industry in developing contexts remain untouched in the literature. Therefore, it is evident that there is a clear gap in the knowledge.

To address the gap in the existing literature, this research investigates the role of the three dimensions of social capital (structural, relational and cognitive) in inter-bank collaboration. In addition, this thesis explores the effect of ICT and other organizational factors that may strengthen or weaken the influence of social capital on collaboration. This thesis will also contribute to a better understanding of the importance of network science approaches to analyze the aspects of and relationships between social capital dimensions and to better predict inter-organizational collaboration. Further, a model will be developed capturing how different aspects of social capital affect the collaboration between banks. The present study follows the research design proposed by Tsai and Ghoshal (1998) using the data collected through a survey conducted in the banking industry in Sri Lanka. The study will employ network analysis approaches and compare results with other statistical techniques such as linear regressions to predict different influences. The results of this thesis shed light on how to improve inter-firm collaboration in local and global financial markets.

Based on the above research gaps, the following research questions are formulated;

1. What components and relationships are needed in a model of social capital and inter-organizational collaboration in the Sri Lankan banking sector?
    1.1. What are the key aspects of the structural, relational and cognitive dimensions of social capital that influence inter-organizational collaboration in the Sri Lankan banking sector?
    1.2. What other factors strengthen (enable) or weaken (inhibit) the influence of social capital on inter-organizational collaboration in the Sri Lankan banking sector?
    1.3. How can network science approaches be used to analyse the aspects of social capital dimensions to better predict collaboration in the Sri Lankan banking sector?

2.7 Summary

This chapter presented a braod discussion of multiple streams of literature that are primarily relevant to this study. These include literature of social capital, inter organizational relations, information and communication technologies and network science. This Chapter also defined the research gap addressed in the present study and formulated the research questions. The following chapter will further discuss a specific set of literature that are pertinent to the development of conceptual model in this study.

Chapter 3

LITERATURE-BASED MODEL

3.1 Introduction

"No organization is an island – all organizations need relationships with other organizations to survive and grow." (Valkokari and Rana 2017).

Inter-organizational relationships (IORs) exist in a variety of forms such as alliances, joint ventures, supply agreements, licensing, co-branding, franchising, cross-sector partnerships, networks, trade associations, and consortia. Researchers have identified the drivers of IORs such as possibility to pool resources and create excess value for both organizations (Nohria and Garcia-Pont 1991), resource limitations (Dyer and Singh 1998, Lavie 2006), accessing new technologies or skills (Barney 1991, Wernerfelt 1995), survival against risks (Gillespie and Teegen 1995, Brüderl and Preisendörfer 1998, Lee 2007), environmental interdependence and perceived resources complementarity (Doz, Olk et al. 2000) or mandates by triggering entities for collective purposes (Dyer and Nobeoka 2000, Thune and Gulbrandsen 2014). This research explores the dimensions of social capital as drivers of IORs in the banking industry.

The preceding chapter summarized the wide-ranging theoretical background of key theoretical areas of this study; social capital, IORs, ICT and Network Science. The present chapter is focused on laying out the theoretical foundations for the new theoretical model proposed in this thesis. Literature reveals the presence of significant support from previous literature for the link between Social Capital and IOR. The substantial body of research reviewed here demonstrates that by adopting a social capital perspective, important insights can be gained into the formation, operations, and performance of IORs, especially in the form of alliances.

The chapter is organised as follows. Firstly, the type of inter-bank alliances focused in this study is discussed in detail including the motivations, risks, stages of alliance

formation, barriers to the alliance formation and the role of social capital in dissolving the barriers in each stage of alliance formation is discussed. Secondly, the specific literature on how the structural, relational and cognitive dimensions of social capital contribute to the formation of alliances through lowering barriers are discussed in detail. The hypotheses and the main conceptual model of this thesis are developed and presented here. Thirdly, the literature relevant to the effects of ICTs on different social capital dimensions are discussed. Also, a range of other organizational factors that may moderate the effect of social capital on IORs are discussed here. Fourthly, the literature relevant to further value creations such as firm performance and corporate social responbility (CSR) are discussed and the extended conceptual models are developed. Fifthly, the operationalization of theoretical constructs and the identification of literature-based indicators are summarized. Finally, the literature relevant to the network measurements used in this study are discussed.

3.2 Inter-Bank Alliances

This thesis considers the 'syndication alliance formation process' in the interbank domain to study the effect of social capital on formation and success of IORs. A syndicated loan is a large loan extended to a single customer by multiple financial institutions, which are formed into a group, or 'syndicate', for that purpose. The borrower could be a corporation or a government. It is analogous to forming an inter-organizational strategic alliance in many ways. A syndicate is a form of long-term partnership between two or more organizations to achieve a shared goal while sharing the associated risks. Forming a syndicate requires identifying suitable partners and negotiating terms of the agreement regarding sharing of risks and benefits.

3.2.1 Motivations

The desire to share a large loan among several lenders may arise due to several factors. Firstly, the capital constraints may promote syndications. Banks with low capital-asset ratios may not want to add large loans to their balance sheets. Instead, they may choose, to share them with other banks by syndicating. Banks are also limited in the size of the loan they can make to an individual borrower. Participating in a syndicated loan thus allows a small bank to make a loan to a large borrower it could

not otherwise make. Syndication also enable banks to achieve diversification in loan portfolios. Participating in syndicated loans can give small and mid-sized banks a chance to lend to borrowers in regions and industries to which they might otherwise have no convenient access. On the other hand, such partnerships allow less experienced banks to share the high risks associated with lending very large sums among other more banks with more experience in lending to similar domains, hence capable of assessing the risks more accurately.

3.2.2 Risks

Syndications signify 'secondary intermediation' between the borrower and other banks. Secondary intermediation is often used to avoid the effective regulatory tax arising from capital requirements (Pennacchi 1988). Secondary intermediation may also result in risk for participating banks. Typically, the lead bank has a legal obligation to make all relevant information about the borrower available to syndicate participants. Even though syndicate members are expected to perform their own analysis rather than depending merely on lead bank, they generally rely on the loan documentation provided by lead bank to conduct their credit evaluation. This leaves the possibility that members are not fully informed or are not adequately compensated through interest and fees for the risks they are taking. This potential risk, resulting from opportunistic behaviour by the leader, may be present because of the contractual 'distance' put between the borrower and the ultimate holder of the loan. Members also face risks because the buyer must rely exclusively on the lead bank for information, monitoring, and enforcement of the loan agreements. Accordingly, formation of syndicates also faces a number of barriers such as fear of opportunistic behaviour, lack of adequate information, communication difficulties and priority conflicts. Therefore, it is pertinent to investigate and further understanding on how to facilitate such partnerships between banking organizations.

3.2.3 Process

The process of formation of syndication alliance go through several phases. A syndication loan is initiated when a borrower approaches a lead bank that will form the syndicate to facilitate the transactions between the borrower and the banks. The

lead bank is often, the largest participant in the syndication and must have sufficient capital strength to be the anchor of the credit. Borrowers tend to approach banks that they share a history with as it is important for a borrower to feel comfortable with the lead bank, and vice-a-versa. Re-joining with the same partners is also seen in joint ventures (Kogut 1991). Once a lead bank has been selected, the process of finding willing banks is undertaken. The choice between single and multiple banking relationships depends on optimization by organizations weighing the costs and benefits (Carletti 2004). Identification of suitable partners can vary in terms of complexity. Some leaders simply send the necessary financial information on the borrower and the intended shape and size of the syndicate group, as well as data on borrower operations, background, management, and marketing to the potential partners. Sometimes, this process can be more complex, involving extensive due diligence, financial projections, and a formal presentation. The joining banks individually and collectively assess the deal with regard to risks and benefits associated with it and consider compatibility with lead banks and other partners. The length of time necessary to form a syndicate is generally less if the banks are already familiar with the borrower's operations. Once the membership is determined, and the terms and conditions are discussed and negotiated among partners, the lead bank will be the primary contact for the borrower and responsible for the administration of the loan including repayments, interest settlements, and fee payments. A key component of the administration is to make sure that communications between the lenders and the borrower remain open so that both sides remain informed about changes. In return, the lead bank is compensated with an annual fee.

3.2.4 Stages of Alliance Formation

The studies that focus on formation of IORs suggest that the process of building relationships includes stages, such as awareness (Dwyer, Schurr et al. 1987), interest (Frazier, Spekman et al. 1988), partner search and selection (Reuer 1999, Spekman 2000), negotiating (Das and Kumar 2011), and the development of rules, routines and alliance management mechanisms (Dyer and Nobeoka 2000). On the other hand, some studies have considered the partnership formation process in terms of pre-formation

and post-formation stages such as in the case of collaborative relationships between Universities and Industry (Al-Tabbaa and Ankrah 2016).

Similarly, the successful establishment of a syndication alliance goes through few stages in general: Initial motivation to collaborate, identification of suitable partners, negotiation of terms and management of the IOR. This process of alliance formation also can be roughly divided in to pre-formation stage and post formation stage. Pre-formation involves decisions on 'whether or not to collaborate' and 'with whom to collaborate' and 'how to collaborate', whereas the post-formation involves conditions required to establish the alliance such as administrative work. As such, the four major stages identified in the inter-bank alliance formation is summarized in the table 3.1.

Table 3.1 : Stages of IOR Formation

Stage Index	Stage of IOR	High-level Stage	Description	Questions
Stage 1	Motivation	Pre-formation	The reasons for initiation	Do we want to collaborate? Is so, Why?
Stage 2	Partner Selection	Pre-formation	Selection of suitable partners	With whom do we like to collaborate?
Stage 3	Negotiation and Agreement	Pre-formation	Negotiation and agreement on Terms	Can we come to an agreement?
Stage 4	Administration and Management	Post formation	Management of IOR	Can we implement and maintain as agreed?

3.2.5 Barriers for Alliances Formation

In IOR literature, only a little has been done to identify the factors that influence the success and failure of IORs (Barkema and Vermeulen 1997, Saxton 1997, Kale and Singh 1999). Some researchers have found that interfirm collaboration has experienced a very high failure rate in their empirical studies (Bleeke and Ernst 1993, Hill and Hellriegel 1994, Dyer and Singh 1998). On the other hand, an unsuccessful

collaboration may also bring high risks to the firms involved (Kuada and Sørensen 2005, Van der Krogt, Nilsson et al. 2007) such as financial and time costs (Augier and Teece 2006). However, there is still no consensus among researchers on the factors that may determine the success or failure rate of inter-firm collaborations.

Typically, establishing effective inter-organizational relationship is a daunting process (Al-Tabbaa, Gadd et al. 2013, Ellegaard and Andersen 2015). Researchers have identified barriers to the inter-organizational collaborations within a certain sector such as telecommunication industry (Zhang 2014) and inter-organizational collaborations in different sectors, for example, Universities - Industry partnerships (Muscio and Vallanti 2014, Ankrah and Omar 2015, Al-Tabbaa and Ankrah 2016). While the syndication alliances between local, foreign, private and state owned banks are also facing similar barriers as discussed above, there are also a number of barriers facing the successful formation of syndication alliances in specific. As such the partnerships are often abandoned before completing. In this study, a set of barriers that typically prevent successful formation of alliances in the banking industry was identified based on both the literature and through interviews with banking experts which augmented the findings from the literature. The risks in inter-firm collaboration can be categorised according to the stages of alliance formation.

3.2.5.1 Stage 1: Barriers to Motivation

If not mandated by the government, or if there is no clearly identified need (such as to avoid capital constraints, or to mitigate high risks), inter-organizational collaborations may not be desired due to **negative attitude** of organizations' decision makers. Organizations may be pre-disposed with a negative attitude towards inter-organizational collaborations. Firstly, organizations may perceive joint work and decision making to be difficult and time consuming. This may be influenced by previous bad experience in collaborations or due to organizational cultural trends that doesn't promote collaborations outside the organizations. Secondly, organizations may **not perceive the true potential or the value** of collaborations. This may be due to the lack of previous experience and knowledge in the domain. A firm's **previous experiences** may pose risks to the development of collaborative partnerships (Das and Rahman 2010, Jia and Rutherford 2010). Previous negative experiences in alliances

such as conflicts may add to the negative attitude towards future collaborations. Risks in IORs may be also associated with a firm's historical and cultural barriers (Kuada 2002, Das and Rahman 2010, Jia and Rutherford 2010). On the other hand, organizations with no previous experience in alliances may also be reluctant to enter into alliances due to perceived difficulties and uncertainties associated with the unknown process.

3.2.5.2 Stage 2: Barriers to Recruitment of Partners

Burt (1992) assumes that partner selection determines effective cooperation between organizations. Partner selection can be a time-consuming process and an in-depth assessment of a partner's strategic objectives cannot be conducted until the negotiation phase (Duysters, Kok et al. 1999). Inability to recruit right partners (capable, trustworthy and compatible partners) within the time constraints may obstruct the success of alliance formation.

Partner recruitment is largely influenced by **fear of opportunistic behaviour, fear of priority conflicts**. In networks of competitors, the basic problem of coordinating inter-organizational relationships is worsened by a heightened threat of opportunistic behaviour (Gulati and Singh, 1998). Lack of trust is the major risk facing most inter-firm collaboration (Kuada and Sørensen 2005, Singh and Mitchell 2005, Williamson 2005, Six, Nooteboom et al. 2010). The lack of trust may result from many sources such as: misallocation of resources; reluctance to give up autonomy; skill and knowledge leakage; the problem of spill-overs; different opinions on management and processes, and opportunistic behaviour (Ohmae 1989, Gulati 1995, Parker 2000, Williamson 2005, Brunetto and Farr-Wharton 2007, Nooteboom, Van Haverbeke et al. 2007).

Lack of adequate information on the alliance partners, the domain and the client pose increased risks and therefore may delay the alliance formation. Most researchers agree that partner selection is closely associated with the establishment of trust (Zaheer, McEvily et al. 1998, Olkkonen, Tikkanen et al. 2000, Poppo and Zenger 2002, Woolthuis, Nooteboom et al. 2010). The lack of information may add to the problem of trust between partners. Partner selection can be a time-consuming process and an

in-depth assessment of a partner's actual strategic objectives cannot be conducted until the negotiation phase (Duysters et al., 1999). This is most critical when the potential partners, client or the domain are previously unknown.

In syndications, the lead bank, recruits sufficient number of suitable partners. Opportunistic behaviour such as withholding unfavourable information from participating banks could be misleading others into making loans that are riskier than they had thought. Syndicate leaders have a legal obligation to make all relevant information available to participants. Moreover, syndicate members and buyers are expected to perform their own credit evaluation rather than rely on lead banks. However, members rely on the loan documentation provided by sellers to conduct their credit evaluation. This leaves the possibility that buyers are not fully informed of the risks they are taking or are not adequately compensated through interest and fees for the risks they are taking. This potential risk of opportunistic behaviour may be present in secondary intermediation, such as syndications, because of the contractual distance between the client and the syndicate participants. Finally, participations are the most susceptible to abuse because the buyer must rely exclusively on the selling bank for information, monitoring, and enforcement of the loan agreements.

Technological Complexity: The technological complexity of partners also add uncertainty to inter-firm collaboration (Auster 1992, Mazloomi Khamseh and Jolly 2008) by making it difficult for the less technical partners to understand and make better use of collaboration. As such differences in technical capabilities between partners may act as a barrier for collaborations or partnerships between them.

3.2.5.3 Stage 3: Barriers to Negotiation and Agreement

Conflicts: Organizations in strategic alliances must engage in joint problem solving because they are linked together to manage an environment that was more uncertain and turbulent than each one could control (Cummings 1984). Therefore, conflicts often arise in inter-organizational relationships due to the inherent interdependencies between partners (Borys and Jemison 1989). While the functional conflicts would enhance an alliance's performance (Morgan and Hunt 1994), dysfunctional conflict

within the alliance would affect the effectiveness of alliance performance (Bucklin and Sengupta 1993). In most inter-organizational collaborations, conflicts usually arise over **benefit distribution** (Heide and Miner 1992, Das and Rahman 2010) and rights of intellectual property of collaboration outcomes (Subramanian, Lim et al. 2016) or conflicts of interests. The power plays and politics between partners may also lead to unnecessary conflicts and delay decisions. Therefore, an agreed benefit distribution is important to the result of inter-firm collaboration (Ohmae 1989; Parker 2000; Das and Rahman 2009).

Poor communication: Effective communication between partners is essential to the success of inter-firm collaboration (Kuada 2002, Stallkamp 2005, Hagedoorn 2006, Wilson 2006, Elg 2007, Zacharia, Nix et al. 2011). Poor communication can increase the cost of transferring skills and technologies (Park and Ungson 1997) and result in misunderstanding. Inability to communicate effectively make pose a great risk to the alliances, especially in the stage of negotiation and decision making. Differences in background, language and shared knowledge may add to the difficulty in communication.

Cultural difference: Cultural differences also add more risk to inter-firm collaboration (Das and Rahman 2009; Vilana and Monroy 2010; Kuada 2002; Das and Rahman 2009; Jia and Rutherford 2010). Different cultures may have very different views on communication, trust, and business profits (Kuada 2002). Cultural difference between partners significantly affects the process and result of inter-firm collaboration (Dyer 1997; Kuada 2002; Felzensztein and Gimmon 2007). Although some cultures are complementary, differences between cultures may still increase the uncertainties and problems in international or cross-regional collaboration (Park and Ungson 1997; Felzensztein and Gimmon 2007). Mandated collaborations are likely to complicate partnership development as threats and opportunities might be perceived differently by organizations with different backgrounds (Perkmann, Tartari et al. 2013). When deciding to collaborate, firms should assess their anticipated ease of working with the other partner in terms of possible language difficulties, cultural differences, style incompatibilities, differences in values and norms, and the presence of a sufficiently strong ‘mentor’ who will help the collaboration (Contractor and Lorange 2002).

The problem becomes even more difficult when the two organizations belong to different sectors, as policies and systems that control the interaction between these organizations vary significantly in terms of flexibility, speed, and autonomous (Al-Tabbaa et al., 2015). Organizations from different sectors may have differences in values, norms, principles and beliefs, whereby the incompatibility between these institutional aspects can create disagreement among collaborators (Muscio and Vallanti 2014). The collaborations between organizations in different sectors suffer due to weak attitudinal alignment (Bruneel, d'Este et al. 2010) and uncertainty over the core aims (Shane and Somaya 2007) .

In syndications, the lead bank has to negotiate details of the agreement with participating banks and preparing documentation. Disputes over sharing of the risks and benefits may lead to conflicts and delays in the process. Although it is possible to assess the partners during the previous stage, an in-depth assessment of a partner's actual strategic objectives cannot be conducted until the negotiation phase (Duysters et al., 1999). Differences in culture, knowledge and backgrounds pose communication difficulties making negotiation and collective decisions further challenging. When the alliance includes both local banks and international banks, there are difficulties in communication due to differences in culture, risk assessments, interpretations etc.

3.2.5.4 Stage 4: Barriers to Administration

In addition to the inherent complications associated with inter-organizational alliances, they also face external barriers that delays completion due to regulatory, political, legal and other societal factors. **Government constraints** are also identified as a common barrier in inter-organizational collaboration. Government regulations imposed on the partnerships consumes time and resources, thus delaying progress (Tabbaa and Ankrah 2016). In certain industries in developing countries, government policies exert a significant influence on business performance and orientation (Keane 2009). In Chinese telecommunications market, the state-imposed constraints have generated market power for certain organizations and created high entrance barriers for other competitors (Kuada 2002, Nie and Zeng 2003, Kuada and Sørensen 2005). 'Too much regulation can distort market performance while too little regulation

exposes new entrants and consumers to risks of abuse by a firm with market power' (OECD 2003 : 28). **As such, bureaucratization** is also a political barrier to inter-firm collaboration (Tabba and Ankrah 2016).

Societal-level dynamics refer to complex processes of interactions between heterogeneous agents in society that often produces unpredictable outcomes (Durlauf and Young 2004). Societal-level dynamics can come from many causes: a change of government policy, of the legal system, or exchange rate of the country; global financial crisis; and new technology development. The risk of societal-level dynamics is hard to predict and avoid. They also increase the relational risks for collaborating firms (Richards and Yang 2007, Van der Krogt, Nilsson et al. 2007, Das and Rahman 2010, Jia and Rutherford 2010).

In syndications, the lead bank handles disbursements and repayments and is responsible for disseminating the borrower's financial statements to the syndicate members. Since the banking domain is highly regulated and regulations and constraints imposed on the partnerships consumes time and resources, thus delaying progress. Nevertheless, the syndication alliances involve multiple parties such as banks, clients, intermediaries, legal consultants and authorities such as central bank and therefore involve lengthy, excessive documentation for legal and procedural requirements. Such overheads de-motivate organizations towards future collaborations.

Summary

However, with the increasing demands on capital and financial services, the limited availability of funds and the inability to bear the high risk associated with lending large sums, inter-bank alliances become unavoidable. The table 3.2 presents a summary of the barriers, categorised according to the stage of IOR formation within which it occurs.

Table 3.2 : Barriers in Different Stages of IOR Formation

Stages	Barriers	Description
Interest	Culture	• When there is an opportunity, lead organizations may be unwilling to collaborate with other organizations due to organizational culture that doesn't promote collaboration.
	Perceived difficulty	• When there is an opportunity, leading organizations may be unwilling to collaborate with other organizations due to perceived difficulty in administration and collective decisions, perhaps due to previous bad experience or lack of awareness.
Partner Selection	Information Barrier	• Inability to identify suitable partners due to lack of adequate information on potential partners' competence, compatibility, interests and status.
	Trust Barrier	• Organizations may be unwilling to invite and include unknown partners in alliances due to fear of opportunistic behaviour or fear of priority conflicts.
Negotiation and Agreement	Communication Barriers	• Difficulty in communicating effectively (sharing and interpreting complex and critical knowledge) create conflicts and make decisions time consuming. • Inability to communicate effectively (sharing and interpreting complex and critical knowledge) and convince partners leads to misunderstandings, and delays the collective decisions. • Lack of commonality in background, vision, knowledge and experience of organizations lead to inconsistent meanings making communication difficult.
Administration	Bureaucratic Barrier	• Administrative, regulatory, and compliance requirements cause unnecessary long delays and hassles in the partnership process. This lead to negative attitude among members making future collaboration less attractive.

3.3 Social Capital's Role in IORs

In the course of their business activities, organizations develop a variety of inter-organizational ties. As previously discussed, a number of barriers may impede the successful formation of IORs. Due to the nature of these barriers, we propose that the resources latent inside and derived from the social capital have the capacity to lessen their effect on inter-bank partnerships. Both the process of partner selection and reaching an agreement on terms such as risks and benefits may greatly benefit from availability of adequate information and referrals, ease of communication, mutual understanding and trust. For instance, shared vision and norms, which are part of the relational capital, influence how people in organizations govern themselves and interface with others (Nahapiet and Ghoshal 1998). Shared norms have been linked to effective cooperation (Arregle, Hitt et al. 2007). The collaborative capacity of organizations depends on the degree that they share norms and values and are prepared to lower individual interests to those of larger groups (Macke and Dilly 2010). From these shared values, trust emerges (Fukuyama 1995). Internal resources such as unique historical conditions that are rare and difficult to imitate become a source of competitive advantage (Macke, SARATE et al. 2010). Similarly, the pattern and the strength of ties among the organizations influence the level of trust between them, lessening the amount of time and investment required to assemble information (Bruneel, d'Este et al. 2010). Furthermore, high level of trust reduces the fears of opportunistic act of partners (Bstieler and Hemmert 2015). Therefore, social capital is viewed as a potentially valuable resource that can be useful in mitigating the intensity of barriers associated with IORs. The following section encapsulates the role of social capital in IOR from two different perspectives:

- **Perspective 1**: The role of social capital in the different **stages of IOR formation** (Motivation, Partner selection, Agreement and Management).

- **Perspective 2:** The specific roles of the **three dimensions of social capital on Inter-Organizational Collaboration (IOC).** This is the **main theme of this thesis** which is empirically tested.

3.3.1 The Role of Social Capital in the Stages of IOR Formation (Perspective 1)

Building on the potential value of social capital, this section provides a detailed investigation on how social capital can be useful in mitigating the intensity of barriers in different stages of IOR formation. As discussed earlier, successful formation of IOR requires fulfilling preconditions such as motivation, trust, effective communication which enable to reach shared decisions and effective exchange and combination of resources. This section reviews recent findings demonstrating **the role of social capital** in the formation of inter-organizational relationships by considering four questions which relates to the **stages of IORs**:

a) How social capital motivates organizations to get involved in IORs?
b) How social capital enable partner selection?
c) How social capital enable agreement between partners?
d) How social capital enable wellbeing / performance of IORs?

3.3.1.1 Motivation (What aspects of social capital influence organizations to collaborate?)

Scholars have previously emphasized clarifications to ‘what drivesan organizationto form alliances’ as discussed in detail in the Chapter 2. In general, organizations either seek collaborations to fulfil their own needs or are mandated to do so. Voluntary collaborations mostly occur when there is a possibility to create excess value through combining resources (Nohria and Garcia-Pont 1991) or as a solution to resource limitations (Mowery, Oxley et al. 1996, Dyer and Singh 1998, Lavie 2006) or as a mechanism of survival against risks (Gillespie and Teegen 1995, Brüderl and Preisendörfer 1998, Lee 2007) or due to environmental interdependence and perceived resources complementarity (Doz, Olk et al. 2000). On the other hand, partnerships may be mandated by triggering entities for collective purposes (Dyer and Nobeoka 2000), in which case, the collaborators do not have strong stimuli to cooperate (Uzzi 1996).

Social capital proves to be a useful resource that motivate organizations to collaborate. In general, social capital is considered as a resource that serves as a source of

competitive advantage, particularly information and knowledge. The benefits of network ties can characterize social capital as ties to resource-filled others (Bourdieu 1985). Social capital enable value creation for organizations through supporting inter-unit resource exchanges (Tsai and Ghoshal 1998). Shared understandings facilitate conditions of accessibility and recombination and give the ability for exchange by providing basis for the transaction (Ansari, Munir et al. 2012).

Information Flows: Social ties between organizations have been identified to influence the inter-organizational collaborations. Social networks act as a medium of information diffusion across organizations. Relevant developments in different technologies may be brought to the organization's attention through its links, some of whom may specialize in those technologies or work with partners who specialize in them (Freeman, Clark et al. 1982). Organizations are generally motivated to collaborate because of the benefits received from such activities. For example, organizations desire entering into alliances when they see a possibility to pool resources and create excess value for both organizations (Nohria and Garcia-Pont 1991) or to access new technologies or skills (Barney 1991, Wernerfelt 1995). Organizations can receive information on the success and failure of many simultaneous research efforts (Rogers and Larsen 1984). Promising technological courses as well as technological dead ends can be brought to the early notice of an organization that is plugged into the network. Constant influx of such updates can motivate organizations to acquire those new technologies, skills of knowledge in to their organizations through seeking opportunities to work collaboratively with other organizations that are already having the knowledge or successfully using them.

Social Conformity: Being embedded in a social network in which majority are engaged in collaborations, may influence focal firm to consider doing the same giving in to ‘social conformity’. There is now a large amount of evidence that those who are already active in some form of network, as individuals or organizations, are more likely to become involved in other networks, including IORs (Nahapiet 2008). Therefore, social networks can influence non-collaborating organizations towards collaborations as a mechanism of social acceptance.

Influence Decisions: Network relations may also influence decision-making and strategic choices, depending upon the strategic location of actors within a network (Burt 2005). Decisions such as whether or not to join alliances therefore may be influenced by the existing social network in which the firm is embedded in. The social ties between top management of organizations are more influential in this case. Eisenhardt and Schoonhoven (1996) reported that top management team social capital translates directly into inter-organizational alliances. BarNir and Smith (2002) found that the overall number of alliances a small firm is engaged in is explained by the propensity, the tie strength, and the prestige of their senior executives.

Prior Experience of alliances also is a good predictor of future alliance activity (Gulati 1999, Chung, Byrd et al. 2005). More specifically, network resources, as indicated by a firm's location in the interfirm network of prior alliances in which they are embedded, and also the position of their partners, are significant predictors of the frequency with which firms enter new alliances (Gulati 1999). In general, firms that have more experience of working with other organizations are more likely to form new and more diverse network ties and to become dominant players in networks (Powell, Koput et al. 1996). Success of inter-firm collaboration is due to a large extent to firm's previous experience and history (Dyer and Singh 1998, Hagedoorn, Kranenburg et al. 2003). The more experience a company has in formal alliances, the more opportunities there are to enter into future partnerships (Harrison 2004, Zacharia, Nix et al. 2011).

Social Solidary may also inspire organizations to engage in further collaborative work. Social solidarity obtains among two or more individuals when there exists a degree of mutual trust and commitment among them, thereby shaping the capacity for cooperative and collective action (Sandefur and Laumann 1998). The collaborative capacity of organizations depends on the degree that organizations share norms and values and are prepared to lower individual interests to those of larger groups (Macke, SARATE et al. 2010). The school of collective social capital emphasizes on mutual support and collective engagement (Putnam 1993, DiMaggio 1994, Putnam 1995, Adler and Heckscher 2006) making it a powerful enabler of inter-organizational entities (Morgan and Cooke 1998).

Identity Reinforcement: Social relations play an important role in forming and reinforcing identity and social solidarity (Nahapiet 2008). The sense of mutual obligation and shared identity may mean that there are stronger connections between members of similar groups such as professional communities that cut across organizational boundaries than between different groups within the same formal organization (Brown and Duguid 2001). Shared identity has important implications for understanding patterns of exchange in IORs (Ferlie, Fitzgerald et al. 2005). Biggart and Delbridge (2004) suggest collective social capital represents exchange based on social solidarity, shared identity, and bonds. The development of norms, identity, and trust has been shown to be facilitated by network closure (Coleman 1990, Ibarra 1993), Social relations can reinforce identity and recognition, and be used to gain public acknowledgement of the actor's claim to resources (Lin 1999).

In addition, **Pre-existent Trust** is also related to behavioural intention (Cummings and Bromiley 1996). As such, the high degree of trust between organizations in the industry may predispose them to act collectively.

3.3.1.2 Partner Selection (How and why are partners selected?)

The selection of business partners has been identified as key to success and key capability for the realization of collaborative networks (Weiß and Klink 2007). It is also a subject of interest of the collaborative networked organization community (Paszkiewicz and Picard 2010). Assessment of competences is seen as a vital part of partner selection processes and partnership formation (Schuster and Weiß 2010). The concept of competence modelling involves partner selection based on organization profiles (Ermilova and Afsarmanesh 2007).

Researchers have focused on several aspects of social capital in explanations of what drivesan organizationto form a strategic alliance with a particular firm. Partner selection involves information gathering and evaluating choices based on available information. Key criteria for partner selection involves trust, resource complementarity, status similarity, and compatibility. Social capital can be viewed as

a useful resource that facilitate partner selection that provide access to required information and broker trust among organizations.

Gather Information

Adequate information is required for the decisions regarding choice of partners. Therefore, organizations with more connections (formal or social) enjoy flux of information leaving them at an advantage when it comes to making informed decisions in partner selection. Social capital yields three different kinds of information benefits to organizations in strategic alliances: information volume, diversity, and richness (Kashlak, Chandran et al. 1998). The relevance, timeliness, and trustworthiness of the information available through social contacts, makes it especially useful (Burt and Knez 1995, Baker 2000). High levels of social capital enable better use of development opportunities (Putnam 1993), due to increased information that facilitate the action (Coleman 1988, Fukuyama 1999). A network can serve as an information-gathering tool (Freeman, 1991) and an information-processing or screening device (Leonard 1984). An inter-organization network can serve as an information conduit, with each organization connected to the network being both a recipient and a transmitter of information (Rogers and Kincaid 1981).

Moreover, it appears that the ability of firms to appropriate the potential value of these information benefits varies according to the structure of alliances and the ways in which they are managed. Structural social capital is a particularly potent explanation of the transfer of explicit and relatively well-understood information and knowledge, whereas cognitive and relational social capital are more influential for complex, uncertain, or tacit knowledge (Hansmann and Ringle 2004). A similar pattern emerges in IORs (McEvily and Marcus 2005). In the research discussed earlier, Uzzi (1999) shows how social relations promote fine-grained information exchange enabling the sharing of more proprietary and tacit information than is possible in more arm's-length ties. They also promote economies of time through the early identification of market opportunities and the ability to act upon them speedily.

Evaluate Choices

Trust: A key criterion in partner selection is the assessment of relational quality of partner such as trust or trustworthiness. In the domain of IOR, many researchers have studied the effect of trust in inter-firm collaborations (Brunetto and Farr-Wharton 2007). Trust is an expression of confidence in inter-firm collaboration. Empirical studies on inter-firm collaboration have also shown that the process and performance of collaboration is closely associated with the establishment of trust (Zaheer, McEvily et al. 1998, Poppo and Zenger 2002) . Trust can benefit inter-firm collaboration by increasing efficiency and reducing cost (Dyer and Singh 1998, Kale and Singh 1999, Nooteboom 2004). It also reduces uncertainty and conflicts (Hill and Hellriegel 1994, Zaheer, McEvily et al. 1998). Risk is also influenced by the trust level in inter-firm collaboration (Adobor 2005). When there is trust, the most important social capital element, there is an expansion of horizontal contacts and consequently, business relationships (Nahapiet and Ghoshal 1998). Adobor (2006) found that personal relationships are more important in the initial phase of an alliance. This is found to be important in China where “Guan Xi” plays an especially important role (Gomez and Hsiao 2004, Lindsey 2008).

Trust is developed through collaboration and communication (Gulati, Nohria et al. 2000, Parker 2000, McEvily, Perrone et al. 2003, Zaheer and Zaheer 2006). It is an invisible asset (Itami and Roehl 1987), which makes future cooperation easier to implement (Nooteboom, Berger et al. 1997). On the other hand, the better the interpersonal communication between firms the greater will be the relationship developed (Hagedoorn 2006). Repeated collaboration between firms increases trust (Gulati 1995). Trust is highly correlated with network positions (Harrison 2004), reputation levels (Lui and Ngo 2005, Husted and Michailova 2009), and the risk/uncertainty level (Adobor 2005) during the inter-firm collaboration. Trustworthiness ofan organizationmay be assessed based on different criteria such as its perceived reputation, previous promise keeping, previous non-opportunistic behaviour and perceived competence.

Prior Ties: According to Burt (2005), actor's network relations may influence strategic choices. Organizations may strategically choose partners to achieve network positions with specific advantages such as power. The social network structure of inter-organizational networks also influencesan organizationto partner with a particular firm (Gulati 1995). The evidence shows that firms are more likely to form relationships with organizations with which they already have a direct or indirect connection (Walker, Kogut et al. 1997, Ahuja 2000). This may be due to factors such as the increased trust and openness that comes with experience (Gulati 1995, Uzzi 1997). Gimeno (2004) found that the type of competitive embeddedness influences partner selection and the types of alliance formed. Prior ties appear to be particularly important under conditions of uncertainty (Gulati 1995) and where it is difficult to measure trust a priori (Zaheer, McEvily et al. 1998). Adobor (2006) found that personal relationships are more important in the initial phase of an alliance. As indicated by Adler and Kwon (2002), a network tie creates the opportunity for social capital transaction. However existing relationships can also become a constraint on network members creating resistance to change (Hagedoorn 2006, Kim, Oh et al. 2006). The evidence suggests that effective organizations seek to add new connections and to manage existing ties in different ways (Koka and Prescott 2002, Maurer and Ebers 2006).

Brokerage or Referrals: In the case of no direct ties between organizations, the intermediate organizations can broker the partnership. In inter-organizational networks, common partners can also serve as referral agents and convey expectations and responsibilities in the process of bringing together two organizations (Gulati 1995, Uzzi 1997). Common partners can use their relationships with both parties to encourage cooperation, reciprocity, and sharing (Uzzi 1997, Gulati 1999). Those having broker positions could facilitate transactions and the flow of information between organizations separated by some gap or barrier. Early theory on these types of roles was developed in Burt's *Structural holes* (2002, 2009), and *Brokerage and Closure* (2005) in of social network theory. Marsden 1982 defines brokers as "intermediary actors who facilitate transactions between actors lacking access to or trust in one another."

External parties acting as brokers play an important role in enabling and sustaining IORs. Human and Provan (2000) show how network brokers helped to build networks and network credibility among small manufacturing organizations in the US wood products industry. Starkey, Barnatt, and Tempest (2000) demonstrate the importance of brokers that connect programme buyers to sellers in the UK television industry. The greater the uncertainty about the quality of new ventures the more outside evaluators rely on the prominence of affiliates to draw on inferences about quality (Stuart, Hoang et al. 1999, Meeus, Oerlemans et al. 2001)

Resources and Resource Complementarity: Scholars of strategic management emphasized on resource complementarity between organizations as a factor in partner selection in IOR (Nohria and Garcia-Pont 1991). Two organizations may enter into an alliance when they believe there is a possibility to pool resources and create excess value for both organizations (Nohria and Garcia-Pont 1991). With the development of new technologies, many firms collaborate to access new technologies or skills (Barney 1991, Wernerfelt 1995). Corporate alliances allow the organizations to gain access to complementary resources and strengthen their competitive positions (Gulati 1995, Baum, Calabrese et al. 2000). More importantly, strategic alliances provide another important option for organizations to grow (Habib and Mella-Barral 2006, Lindsey 2008). Many emerging industries and entrepreneurial organizations rely on alliances and collaborative initiatives with larger organizations (Powell, Koput et al. 1996, Alvarez and Barney 2001, Zollo, Reuer et al. 2002). Other factors are also influential in the selection of IOE partners. In the area of relational management, Ahuja (2000) examines inter-organizational collaborations and identifies different types of capital that can affect a firm's inducements and opportunities to form linkages. According to this study, both technical and commercial capital are important influences on the attractiveness of potential partners. Social capital was more important than technical capital but less important than commercial capital in the formation of linkages. Social capital was a good predictor of joint venture formation but not of technology agreement formation, perhaps because of the more specific needs of the latter.

Status Similarity: There is evidence that inter-organizational collaborations are more likely if partners have similar status and power (Podolny 1994). Chung, Singh, and

Lee (2000) found that investment banks were more likely to form syndicates to underwrite corporate stock offerings if their statuses were similar. They identified that resource complementarity, status similarity and social capital ofan organizationcharacterized by its prior alliance experiences, degree of reciprocal opportunity exchange and number of indirect ties between two organizations were identified as drivers of alliance formation between investment banks in U.S (Chung, Singh et al. 2000). However, the dynamics of status similarity are complex. Gulati and Gargiulo (1999) found that two firms were likely to form a strategic alliance if both were central in a relevant inter-organizational network of alliances but not if they were both peripheral.

Social Credentials make potential partners more attractive, especially in absence of prior partnerships. Social capital also acts as a 'credential' attesting to that actor's social standing and indicating the likely resources and support available to him or her (Bourdieu 1986, Stuart, Hoang et al. 1999, Meeus, Oerlemans et al. 2001).

Other Social Mechanisms: In social sciences, the possibility of tie between two people are explained through various social mechanisms. Just as the social capital operates both in micro and macro levels, it is also important to understand what social conditions make it more or less likely for partnerships to build between organizations. Accordingly, partner selection could be also viewed from a different perspective. In inter-organizational social networks, organizations with high centrality could be at an advantage in the amount of information in receives and its ability to communicate to others faster. Actors associated with high in-degree centrality are known to have high Prestige (Wasserman and Faust 1994). People fulfil social motives such as sociability, approval, and prestige through ongoing personal relationships (Nahapiet and Ghoshal 1998). In inter-organizational domain, organizations may prefer to partner with high prestige organizations. In a study of IOR Fang (2011) find that allying with a prestigious partner can provide an endorsement effect and benefit the borrowers by reducing the price of bank loans. On the other hand, Homophily refers to the similarity of two agents. If two actors share common interests, beliefs, goals, or culture, they are more likely to form connections. Some researchers believe that partially shared ownership (Parker 2000) and similar firm size and processes (Gulati 1998) are the

important predictors of successful inter-firm collaboration. The collaborative capacity of organizations depends on the degree that organizations share norms and values (Macke and Dilly 2010). Similarly, Proximity suggests that if two nodes are geographically closer to each other, there is a much higher likelihood that they will form a link (Sailer and McCulloh 2012). As such, organizations with geographically closer headquarters may tend to collaborate more than with others. Reciprocity studies whether agents tend to reciprocate directed relationships. In IOR, organizations may wish to reciprocate opportunities to others in similar nature to the returning of favours between individuals. Obligation can be viewed as reciprocity on a mutual basis such as a readiness to return a favour with a favour (Pezzoni, Sterzi et al. 2012). Transitivity is another common attribute of networks (Newman 2003) based on the assumption that a transitive "cognition balance" occurs overcoming disagreement and consistency in cognition among actors (Cartwright and Harary 1956). In IORs, organizations may eventually tie with certain organizations just because they both share a common partner. The Balance theory attempts to assess the stability of social networks. In the case of three entities, a balanced state exists if all three possible ties are positive or if two are negative and one positive ("Your friend is my friend.") or if two are negative and one positive ("Your enemy is my enemy.") (Heider 1946. p. 110). In IORs, organizations may prefer to ally with allies of their former partners.

3.3.1.3 Negotiation and Agreement (What factors enable effective communication and collective decisions?)

Effective Communication and Knowledge Sharing: Effective communication between partners is widely identified as an important predictor of successful inter-firm collaboration (Olkkonen, Tikkanen et al. 2000, Parker 2000, Kuada 2002, Stallkamp 2005, Hagedoorn 2006, Wilson 2006, Elg 2007, Zacharia, Nix et al. 2011). In inter-organizational collaborations, communication influences the trust relationship, network stability, risk reduction (Olkkonen, Tikkanen et al. 2000, Elg 2007, Zacharia, Nix et al. 2011) and allows the partners to understand the alliance goals, roles and responsibilities of all the actors. Greater frequency of communication between partners can affect not only the success of collaboration, but also the performance of firms (Indro and Richards 2007, Zacharia, Nix et al. 2011). The effective communication

requires effectively sharing knowledge leading clear conclusions and perceptions. The importance of knowledge as a key resource underpinning the competitiveness and performance of organizations is now well established (Grant 1996) and its importance applies both within and between organizations (Eisenhardt and Santos 2002).

Social capital enables better communication and knowledge sharing (Tsai, Ma et al. 2014). Social networks facilitate multiplexity in communication between parties in social networks. It also helps with the sharing and dissemination of individual experiences (Inkpen 1996). Social relations promote fine-grained information exchange enabling the sharing of more proprietary and tacit information and joint problem solving (Uzzi 1996, Uzzi 1997). While structural social capital supports transfer of explicit and relatively well-understood information and knowledge, Cognitive and Relational social capital are more influential for complex, uncertain, or tacit knowledge (Hansen 1999). Nahapiet and Ghoshal (1998), Inkpen and Tsang (2005) show how the dimensions affect the transfer of knowledge between network members in three different types of institutional setting: intra-corporate networks, strategic alliances, and industrial districts. It is known that through investing enough time, resources, suitable personnel and creating the willingness to build long-term relationships, organizations can improve inter-organizational communications (Zacharia, Nix et al. 2011).

Collective Decisions: Inter-organizational collaborations require organizations to make collective decisions that are often difficult and time consuming. For e.g. Benefit distribution makes collaboration inherently risky (Heide and Miner 1992, Das and Rahman 2010). Joint problem solving is an essential requirement in strategic alliances (Cummings 1984). However, conflict often exists in IORs due to the inherent interdependencies between partners (Borys and Jemison 1989).

Social capital is a useful resource that facilitate collective decisions and agreements. Pre-existent mutual trust and commitment (solidarity) shape the capacity for cooperative and collective action (Sandefur and Laumann 1998). The collaborative capacity of organizations depends on the degree that organizations share norms and values and are prepared to lower individual interests to those of larger groups (Macke,

SARATE et al. 2010). Shared norms positively affect effective cooperation (Arregle, Hitt et al. 2007). When there is a degree of mutual trust, commitment and mutual obligation through shared identity among two or more actors, it can shape the capacity for cooperative and collective action (Sandefur and Laumann 1998). On the other hand, deeply embedded networks can also foster fine-grained information transfer and joint problem solving (Uzzi 1997). Trust reduces uncertainty and conflicts (Zaheer, McEvily et al. 1998, Adobor 2005) during collective decision making. High level of trust reduces the fear of opportunistic act of partners (Bstieler and Hemmert 2015) and perceived risk (Adobor 2005).

Power (Influential, Bargaining, Negotiation): Sometimes in IORs, collective decisions and agreement may not be reached due to unnecessary conflicts and power plays. Influential power (prestige) of the leader helps to reach consensus and drive to conclude collective decisions soon. In the context of IOR, power can arise in several ways. First, one firm having some resource that another need (Medcof 2001) give rise to bargaining power. In strategic alliances, owning a scarce resource is viewed as a source of power (Grimshaw, Vincent et al. 2002). Having control over information is also seen as a source of power (Inkpen and Beamish 1997). Secondly, the structural positions or leadership positions clearly act as a source of power as it predisposes firm to dominate decisions (Kassler and Goldsberry 2005). Thirdly, power can also arise when one of the two partners view the partnership as less critical to its individual strategic needs (Casciaro and Piskorski 2005). Casciaro and Piskorski (2005) argue that overall power position should be a combination of these difference power holdings.

Social capital is an important shaper of power and influence (Nahapiet 2008). In the organizational literature, one's relationships serves as a source of power (Brass and Burkhardt 1992). Centrally located actors with many direct relationships with other organizations are in stronger position to influence others (Degenne and Forsé 1999) and draw others together (Eden 2004) or play brokering role (Thurmaier and Wood 2002). Brokers ("go-betweens") in advice-seeking networks have informal power (Luo 2005). Zheng (2010) finds structural capital leads to intermediate outcomes that include diversity of information, power and influence. Unique historical conditions,

that are difficult to imitate may also serve as a source of competitive advantage for organizations (Macke, SARATE et al. 2010).

Brokers play an important role in enabling and sustaining IORs (Human and Provan 2000, Starkey, Barnatt et al. 2000). Brokers play a vital role in drawing together individuals and teams that are periodically reconnected for recurrent projects. Honig and Lampel (2000) consider the part played by 'hub organizations' whose task is to facilitate agreement by inducing trust and reducing transaction costs between inter-organizational network members. Dhanaraj and Parkhe (2006) identify the coordinating processes of hub firms acting as intermediaries in loosely coupled networks where hierarchical authority is absent. The presence of a sufficiently strong 'mentor' who will help the collaboration is also a factor contributing to the success of alliance formation (Cummings and Bromiley 1996).

3.3.1.4 Management (What enables wellbeing of IORs?)

IORs face various external impediments such as Government regulations imposed on the partnerships (Al-Tabbaa and Ankrah 2016), Bureaucratization (Lange 1938, Al-Tabbaa and Ankrah 2016) and Societal-level dynamics (Durlauf and Young 2001) caused by a change of government policy, of the legal system, global financial crisis or new technology development. Such bureaucratic issues consume time and resources, thus delaying progress and therefore increases the relational risks for collaborating firms (Richards and Yang 2007, Van der Krogt, Nilsson et al. 2007, Das and Rahman 2010, Jia and Rutherford 2010)

There is also considerable evidence that social capital is an important factor affecting performance of IOR. The strength of relationship with the government is an important indicator of a firm's competitiveness in some developing countries (Lu, Huang et al. 2006). There are curvilinear relationships between the degree and strength of network ties and performance in IORs (Uzzi, Guimera et al. 2006). Strong ties appear to increase performance in relatively stable industries, whereas weak ties increase performance in relatively dynamic industries (Rowley, Behrens et al. 2000). Personal contacts and pre-existent trust between organizations and external stakeholder enable

to reduce the need for unnecessary administrative hurdles and achieve closure quickly and leaves positive attitude for future collaborations. Social capital reduces administrative and regulatory needs imposed on the partnerships consumes time and resources, thus delaying progress (Al-Tabbaa and Ankrah 2016). Hansen (1999) and Moran (2005) found that structural embeddedness plays a strong role in explaining performance in more routine, execution-oriented tasks whereas relational embeddedness plays a strong role in explaining new, innovation-oriented tasks. Table 3.3 summarizes the role of Social Capital in lowering barriers in different stages of IORs.

Table 3.3 : The Role of Social Capital in Dissolving Barriers in IOR Formation

Stage	Conditions	IOR Activity	Problems	Social Capital Solution
Motivation (why)	Positive attitude towards collaboration	Evaluate risks and benefits of collaborating, anticipate	Lack of interest towards collaboration.	• **Information** channels spread success stories and opportunities creating awareness and influence. • Social **Influence** lead to conformity. • Pre-existent **solidarity** with other organizations can encourage collaborative work • **Collective understandings or visions** predispose organizations to collaborate. • Personal contacts and **pre-existent trust** with organizations reduce the need for formalities, reduce perceived risks of conflicts and reinforce positive attitude • In the absence of a clear need, organizations may wish to collaborate with another firm to **reciprocate prior opportunity** • Social needs such as **prestige, and acceptance** may drive organizations to ally with certain organizations.
Partner Selection (with whom)	Availability of suitable partners	Identify potential partners,	Lack of information	• Social contacts (direct, indirect) act as **information** channels bringing complete, diverse, quick information about potential partners. • Organizations with prior experience in IOR formation process find is easier to identify new partners. • Information from trustworthy sources may also matter • Social contacts enable access to new partnership 'opportunities' through information and referrals

			Fear of opportunistic behaviour and conflicts	• Pre-existent trust with other firm reduce uncertainty • Trustworthy referrals can broker trust with new unknown partners • Social credentials help new partners to appear more trustworthy • Strong shared norms, vision, and understandings reduce priority conflicts • Reciprocal obligations held by organizations reduce fear of priority conflict • Organizations tend to select partners with pre-existent bonds
			Compatibility issues	• Perceived cognitive similarity with other firm may predispose organizations to be mutually compatible. • Strong shared norms reduce issues arising due to compatibility gaps
Agreement (how)	Capacity communicate & make joint decision	Negotiate terms on sharing risks and benefits,	Inability to communicate effectively, and arrive at a joint decision	• Cognitive similarity (Shared understandings, vision, norms and knowledge) enable organizations to effectively communicate, reduce conflicts and making collective decisions easy. • Pre-established trust, reduce need to verifications and makes collective decisions quick • Social networks allow fine grained information transfer enable organizations to share knowledge in issues leading to best practices. • Leading firm's social power, status, identity help reaching consensus effectively • The intermediary facilitators play a key role in developing the cognitive side of social capital in the link
Management	Capacity to maintain	Adhering to the terms fulfil	Bureaucratic hassles delay the completion. Opportunistic behaviour pose threats	• Personal contacts with authorities and pre-existent trust enable to reduce the need for unnecessary administrative hurdles • Dense social networks prevent future opportunistic behaviours due to the pressure of spreading through social contacts and damaging image. • Leader's social power, identity, status and links with members and external stakeholders help to avoid certain administrative hurdles

Table 3.4 provides a summary of literature on different benefits of social capital towards the IOR formation.

Table 3.4 : Summary of Literature on Social Capital's Role on IOR formation

Outcome of SC	Evidence from Literature
Social influence	• Relevant developments in different technologies may be brought to the organization's attention through its links, some of whom may specialize in those technologies or work with partners who specialize in them (Freeman, 1982). • Organizations can receive information on the success and failure of many simultaneous research efforts (Rogers and Larsen, 1984). Promising technological trajectories as well as technological dead ends can be brought to the early notice of an organization that is plugged into the network. • Network relations may also influence decision-making and strategic choices, depending upon the strategic location of actors within a network (Burt, 2005). • Pre-existent trust is related to behavioural intention (Cummings and Bromiley 1996; Hartono 2004)
Need for prestige	• People fulfil social motives such as sociability, approval, and prestige through ongoing personal relationships that belongs to the relational capital (Nehapiet and Ghoshal 1997). • R&D collaborations are motivated by the need for obtaining prestige or visibility (Katz and Martin, 1997; Beaver, 2001)
Reciprocity	• Obligation can be viewed as reciprocity on a mutual basis such as a readiness to return a favour with a favour (Pezzoni et al, 2012)
Information Flow (for decision making)	• Social capital yields three different kinds of information benefits to organizations in strategic alliances: information volume, diversity, and richness (Koka and Prescott, 2002). • The relevance, timeliness, and trustworthiness of the information available through social contacts, makes it especially useful (Burt, 1992, 2005; Baker, 2000). • An inter-organization network can serve as an information conduit, with each organization connected to the network being both a recipient and a transmitter of information (Rogers and Kincaid, 1981). • A network can serve as an information-gathering tool (Freeman, 1991). • A network can also serve as an information-processing or screening device (Leonard, 1984). • High levels of social capital enable better use of development opportunities (Putnam et al 1993), due to increased information that facilitate the action (Coleman 1988), (Fukuyama 1999).
Influential Power (beneficial in negotiations,	• Social capital is an important shaper of power and influence (Nehapiet 2007). • Zheng (2010) finds structural capital leads to intermediate outcomes that include diversity of information, power and influence.

and collective decisions)	• Centrally located actors with many direct relationships with other organizations are in stronger position to influence others (Degenne and Forse 1999) and draw others together (Eden 1996) or play brokering role (Thurmaier and Wood 2002). • In the organizational literature, one's relationships serves as a source of power (Brass, 1992). • Organizations that span "structural holes" are considered to be brokers, often occupying positions of considerable power of influence (Burt, 1992). • Brokers ("go-betweens") in advice-seeking networks have informal power (Luo, J.-D. 2005). • Unique historical conditions, that are difficult to imitate are viewed as an internal resource that acts as a source of competitive advantage for organizations [Macke at el 2010].
Access to Resources	• The benefits of network ties can characterize social capital as ties to resource-filled others (Borgatti & Foster, 2003). • Social capital enabler value creation for organizations through supporting inter-unit resource exchanges (Tsai and Ghoshal 1998) • Shared understandings facilitate conditions of accessibility and recombination and give the ability for exchange by providing basis for the transaction (Ansari et al 2012).
Social solidarity	• Social solidarity arises among individuals when there exists a degree of mutual trust and commitment among them, thereby shaping the capacity for cooperative and collective action. (Sandefur and Laumann 1998). • The collective social capital represents exchange based on social solidarity, shared identity, and bonds (Biggart and Delbridge, 2004).
Identity reinforcement	• Social relations play an important role in creating and reinforcing identity and social solidarity. (Nehapiet 2007). This sense of mutual obligation through shared identity may mean that there are stronger connections between members of similar groups such as professional communities that cut across organizational boundaries than between different groups within the same formal organization (Brown and Duguid 2001). • 'Shared identity has important implications for understanding patterns of exchange in IORs (see e.g. Ferlie et al. 2005)
Social credentials	• Social capital act as 'a "credential" attesting to that actor's social standing and indicating the likely resources and support available to him or her (Bourdieu 1986: 249; Stuart et al. 1999; Meeus et al. 2001). • Social relations can reinforce identity and recognition, and be used to gain public acknowledgement of the actor's claim to resources (Lin, 1999).
Referrals / Brokerage	• In the inter-organization networks, common partners can also serve as referral agents and convey expectations and responsibilities in the

	process of bringing together two organizations (Gulati, 1995; Uzzi, 1997). • Common partners can use their relationships with both parties to encourage cooperation, reciprocity, and sharing (Gulati, 1999; Uzzi, 1997).
Increased Trust	• Trust is developed through communication (Zaheer and Zaheer 1997 Parker 2000) • In the inter-firm collaboration, trust is highly correlated with network positions (Harrison 2004). • Repeat collaboration between firms increases trust between partners (Gulati 1995a). • When there is trust, the most important social capital element, there is an expansion of horizontal contacts and consequently, business relationships (Nahapiet, and Ghoshal 1998). • Trust can benefit inter-firm collaboration by increasing efficiency and reducing cost (Dyer and Singh 1998; Kale 1999; Nooteboom 2004).
Reduced uncertainty, conflicts	• Trust reduces uncertainty and conflicts (Hill 1990; Zaheer et al. 1998; Adobor 2005). • High level of trust reduces the fear of opportunistic act of partners (Bstieler et at, 2015). • Risk is also influenced by the trust level in inter-firm collaboration (Adobor 2005).
Reduce operation cost	• Social capital lead to reduced operation costs (Careya et al 2011).
Effective communication, Knowledge Sharing	• Social capital enables better communication and knowledge sharing (Tsai et al 2014) • Social relations promote fine-grained information exchange enabling the sharing of more proprietary and tacit information (Uzzi 1996, 1997). • While structural social capital supports transfer of explicit and relatively well-understood information and knowledge, Cognitive and Relational social capital are more influential for complex, uncertain, or tacit knowledge (Hansen 1999). • Networking relationships between managers and their key customers and suppliers facilitate the creation, acquisition, and exploitation of knowledge (Dyer and Nobeoka, 2000; Yli-Renko et al., 2001).
Reduce formalities	• Social capital reduces administrative and regulatory needs imposed on the partnerships consumes time and resources, thus delaying progress (Tabbaa and Ankrah 2016)
Effective Joint decision making	• Deeply embedded networks can also foster fine-grained information transfer and joint problem solving (Uzzi, 1997).

	• The collaborative capacity of organizations depends on the degree that organizations share norms and values and are prepared to lower individual interests to those of larger groups (Macke 2010). • Shared norms have been linked to effective cooperation (Arregle et al 2007). • The norm of generalized reciprocity resolves problems of collective action and binds communities (Adler 2002). • When there is a degree of mutual trust, commitment and mutual obligation through shared identity among two or more actors, it can shape the capacity for cooperative and collective action (Sandefur and Laumann 1998)

3.3.2 The Role of Three Dimensions of SC in IOC (Perspective 2)

3.3.2.1 Interrelationships between the Three Dimensions of SC

Nehapiet and Ghoshal (1998) introduced the three dimensions of social capital, carefully grouping different social capital resources in attempt to better understand the concept. Structural dimension refers to the connections or interactions that individuals or organizations have with others (Zheng 2010). Relational dimension refers to those resources created through a history of interactions such as trust. Cognitive dimension refers to resources such as common interests, understandings, visions, knowledge and norms that members develop. These resources facilitate conditions of accessibility and recombination and give individuals the ability for exchange by providing a common basis for the transaction (Ansari, Munir et al. 2012). Studying the interaction between the three dimensions and their facets became an important theme within the social capital literature. Nehapiet and Ghoshal (1998) emphasized that the three dimensions are interrelated in important manner where they are not simply mutually reinforcing. Several empirical studies attempted to identify the nature of these interrelations (Tsai and Ghoshal 1998, Zheng 2010, Camps and Marques 2014, Roden and Lawson 2014, Bstieler, Hemmert et al. 2015). While Structural dimension is found to be an antecedent for the relational dimension (Tsai and Ghoshal 1998, Bstieler, Hemmert et al. 2015), both structural and cognitive dimensions influence the development of relational capital (Roden and Lawson 2014). However, Bstieler et al (2015) show an interdependency between structural dimension and relational capital, but the cognitive capital was moderating this effect.

a) Structural Dimension and Relational Dimension

Structural dimension is found to be an antecedent for the relational dimension (Tsai and Ghoshal 1998, Bstieler, Hemmert et al. 2015). The social interaction ties may produce trust and perceived trustworthiness. Earlier studies have suggested that trusting relationships evolve from social interactions (Granovetter 1985, Gulati 1995). As two actors interact over time, their trusting relationship will evolve, and the actors

are more likely to perceive each other as trustworthy (Gabarro 1978). Trust among the French financial elite was strengthened by multiplex relations of party, neighbourhood, and friendship (Kadushin 1995) . Furthermore, the network literature on tie strength provide evidence that strong interaction ties produce for trust and trustworthiness (e.g. Krackhardt, Nohria et al. 2003). Obligation is viewed as reciprocity on a mutual basis such as the readiness to return a favour with a favour (Pezzoni, Sterzi et al. 2012). Ties of frequent and intense interactions call for obligations (Nahapiet and Ghoshal 1998). In the IOR domain, Hagedoorn (2006) finds that, the better the interpersonal communication between firms the greater will be the relationship developed. Frequent and close social interactions permit actors to know and trust one another, to share important information, and to create a common point of view. Therefore, an organizationoccupying a central location in a social interaction network is likely to be perceived as trustworthy by other organizations in the inter-organizational network.

Hypothesis (H1): The centrality of an organization in the inter-organizational social interaction network will be positively associated with the level of its perceived trustworthiness.

b) Structural Dimension and Cognitive Dimension

Structural dimension is found to be an antecedent for cognitive dimension (Tsai and Ghoshal 1998). The link between the structural and the cognitive dimensions of social capital is based on the idea that social interaction plays a critical role both in shaping and sharing a common goals and values among members. Krackhardt (1990) studied individual actors' cognitive accuracy through the overall social structure in a firm. The social interactions can influence the development of a shared vision. Informal social interactions are found to be important in helping individuals to learn organizational values (Van Maanen 1979, Schein 1990). Through the social interaction, actors assume their organizations' languages, codes, values, and practices. At the same time, these socialized actors may create new sets of values or visions based on their common interests and mutual understandings. In the inter-bank domain, different organizations may have different goals and interests and priorities. Similarly, organizations also

share a collective alignment toward industry goals. These conditions together help to establish the firm's vision. Therefore, we expected thatan organizationoccupying a central location in the inter-organizational network of social interactions would be likely to share understandings, vision and values with other organizations.

Hypothesis (H2): The centrality of an organization in inter-organizational social interaction will be positively associated with the extent to which it shares an understanding with other organizations.

c) Cognitive Dimension and Relational Dimension

Cognitive dimension is concerned with resources such as common understandings, values and vision, which may in turn encourage the trusting relationships. Zheng (2010) declares that literature does not provide clear cut off between relational and cognitive dimensions and propose these two dimensions are highly correlated. A trusting relationship between two parties implies that "common goals and values have brought and kept them together" (Barber 1983 : 21). As Ouchi noted, "Common values and beliefs provide the harmony of interests that erase the possibility of opportunistic behaviour" (1980 : 138). Sitkin and Roth (1993 : 368) also maintained that trusting relationships are rooted in value congruence-the compatibility of individuals' values with an organization's values. The collaborative capacity of organizations depends on the degree that organizations share norms and values and are prepared to lower individual interests to those of larger groups (Macke, SARATE et al. 2010). From these shared values, trust emerges (Fukuyama 1995). Share norms may also cause unnecessary expectations of obligatory behaviour resulting in free riding issues (Inkpen and Tsang 2005). When there are collective goals and values, members are inclined to trust one another. In the inter-bank domain, any firm that shares the industry's collective goals or values is likely to be perceived as trustworthy by other organizations.

Hypothesis (H3): The extent to which an organization shares an understanding with other organizations will be positively associated with the level of its perceived trustworthiness.

3.3.2.2 Social Capital and IOC

a) Structural Dimension and IOC

The **structural dimension** of social capital is comprised of the actual links that provide the opportunity for accessing resources or acting together in the network. It focuses on the properties of the network of relations as a whole (Nahapiet and Ghoshal 1998). Links can be formal or informal. The presence or absence of ties between actors (Wasserman and Faust 1994, Nahapiet and Ghoshal 1998) and the network configuration (Krackhardt 1990) are commonly identified facets of the structural dimension.

Structural dimension is represented strongly in the influential work of Burt (1993, 1997, 2002, 2005, 2009). Social capital is defined as the advantage created by a person's location in a structure of relationships (Burt 2004, Burt 2005). Network locational properties have been considered as the measurements of the structural dimension (Borgatti and Everett 1992, Borgatti and Everett 1997, Borgatti, Jones et al. 1998, Borgatti, Mehra et al. 2009). In IORs, structural dimension encapsulates the ties that individuals or organizations have with others (Zheng 2010). Ego-centric theories in IORs focus on the "relational embeddedness" of organizations (e.g. Uzzi 1997, Ahuja 2000, Burt 2000, Gnyawali and Madhavan 2001) in terms of structural qualities such as centrality, multiplexity and brokerage in an attempt to explain firm-level outcomes such as performance (Provan, Fish et al. 2007). Some positions identified to be more beneficial than other positions (van Liere 2007). In particular, "bridging" (Burt 2002) and "closed" (Coleman 1988) network positions have often been linked to the improvement of firm performance. Both structural holes and closure are important but at different points in time (Soda et al. 2004).

The social ties have been further classified based on the strength and diversity of the ties (bonding, bridging and linking) (Woolcock and Narayan 2000, Adler and Kwon 2002, Woolcock 2002, Woolcock and Narayan 2006), the direction (horizontal and vertical) and the formality (formal and informal). Bonding social capital refers to horizontal, cohesive ties between individuals or groups sharing similar characteristics

in homogeneous networks (e.g. attending the same institution). Bridging social capital, refers to ties that cut across different social groups (e.g. relationship between managers in two organizations) (Woolcock 2002, Ferlander 2007). Linking social capital refers to vertical ties connecting individuals across different vertical social levels (e.g. between a subordinate and the top executives in the same company) (Woolcock 2002, Ferlander 2007).

Social ties between organizations can serve as a particularly useful resource in IORs. First, Social Interaction ties are channels for **information** flows (Nahapiet and Ghoshal 1998, Tsai and Ghoshal 1998). A social network can serve as an information-gathering tool (Freeman 1991) as well as an information-processing or screening device (Leonard 1984), by enabling relevant, timely, and trustworthy information (Baker 2000, Burt 2005). Social networks serve as a resource reducing partner search costs in IORs (Wong and Ellis 2002). It is therefore agreed that, high levels of social capital enable better use of opportunities (Putnam 1993), due to Increased information that facilitate the action (Coleman 1988, Fukuyama 1999). In fact, social capital was defined in terms of volume, diversity, and richness of information that is available to organizations in strategic alliances (Koka and Prescott 2002). In IORs, Structural social capital is a particularly potent explanation of the transfer of explicit information (Hansen 1999, McEvily and Marcus 2005).

Secondly, social ties also enable **access to resource-filled others** (Borgatti and Foster 2003) allowing innovators to go across formal lines to find what they need (Kanter 1988 : 190). Social Interaction ties also facilitate exchange of resources with other units flows Tsai and Ghoshal (1998) provide evidence that inter-unit social interaction ties positively influence inter-unit formal resource exchanges and strongly suggest that future research at the inter-organizational-level. Adobor (2006) found that personal relationships are more important in the initial phase of an alliance.

Thirdly, social relations create the possibility of **multiplexity** where two nodes may be tied in multiple ways (work and friendship) enabling a number of different flows between a pair (advice, help, solution to a problem) (Beggs, Haines et al. 1996, Lazega and Pattison 1999, Cross, Borgatti et al. 2001). Therefore, social relations can pave

pathways to multiple flows such as information, ideas, support, advice, knowledge between organizations in IORs opening the doors to multiple and alternative modes of communication. It is possible to compare total networks composed of the same nodes but different relations by correlating to the two matrixes (Pattison and Wasserman 1999). Using an agent-based simulation to study how a collaboration network emerges from the inter-organizational communication network, Zhao et al (2012) found that encouraging communication between peripheral organizations can better promote collaboration than other strategies.

Fourthly, structural social capital acts as an important shaper of **power and influence** in IORs (Brass and Burkhardt 1992, Nahapiet 2008, Zheng 2010). Promising developments in technologies may be brought to the early notice of organization through its links with others (Freeman 1982). Organizations can receive information on the success and failure of many efforts (Rogers and Larsen 1984). Network relations may also influence decision-making and strategic choices, depending upon the strategic location of actors (Burt 2005). The network of inter-organizational relationships constrains and shapes a organization's action with regard to alliance formation and partner selection (Gulati 1995, Ahuja 2000). In the inter-organization networks, common partners can serve as referral agents and use their relationships with both parties to encourage cooperation, reciprocity, and sharing (Uzzi 1997, Gulati 1999). The brokers in advice-seeking networks have informal power (Luo 2005). Centrally located actors with many direct relationships with other organizations are in stronger position to influence others (Degenne and Forsé 1999) and draw others together (Eden 1996) or play brokering role (Thurmaier and Wood 2002). Organizations that span "structural holes" are considered to be brokers, often occupying positions of considerable power of influence (Burt 1992).

Fifthly, social ties may also play an important role in **creating and reinforcing identity** and social solidarity (Nahapiet 2008). Biggart and Delbridge (2004) suggest that exchanges can be based on social solidarity, shared identity, and bonds. While social relations lead to collective engagement (Putnam 1993, DiMaggio 1994, Putnam 1995, Adler and Heckscher 2006), they can also be a powerful enabler of inter-organizational entities (Morgan and Cooke 1998). Using a case of bio-technology

start-ups, Walker, Kogut and Shan (1997) demonstrated that formal network formation is significantly influenced by the nurturing of social capital. In the domain of IORs, social interactions among organizations may blur the boundaries between organizations and stimulate the formation of common interests, leading to collective actions. An individual firm then has more opportunities to exchange or combine its resources with other organizations. Professional and occupational communities that cut across organizational boundaries of formal organization (Brown and Duguid 2001) provides important implications for understanding patterns of exchange in IORs (Bouty 2000, Ferlie, Fitzgerald et al. 2005). Encouraging communication between peripheral organizations have been found to better promote collaboration than other strategies Zhao et al (2012).

Sixth, social ties are associated with **economic outcomes**. Sociologists find that economic relationships are embedded in various instituted social relationships (Granovetter 1985). Although the relationship between formal and social relations can be complex (Podolny and Baron 1997) it is evident that social relations augment the formal relations in getting things done (Lazega and Pattison 1999). Embeddedness in political, legal, cultural, industry, and environmental conditions impact the likelihood of inter-organizational network formation and the forms of networking (Oliver and Ebers 1998). Inter-organizational social interaction has been shown to support the creation and diffusion of innovations within multi-unit organizations (Ibarra 1993, Ghoshal, Korine et al. 1994, Leonard-Barton and Doyle 1996, Powell, Koput et al. 1996).

Social ties between organizations have been previously studied using micro level ties between managers in those organizations. A line of previous research has explored the micro-macro link focusing on the inter-personal links with **managers of other organizations** and **outside stakeholders** as a resource that facilitate firm-level benefits such as increased performance (Peng and Luo 2000, Park and Luo 2001, Acquaah 2007, Kim 2007, Acquaah 2012) and strategic choice (Geletkanycz and Hambrick 1997). There is also evidence from Ghana that managerial networking relationships with top managers of other firms enable organizations to secure access to information, resources, and knowledge that are used to improve performance

(Acquaah 2007). The greater the environmental uncertainty, the more likely it is that organizations will rely on managerial ties when entering exchange relationships (Powell and Burke 1990). One explanation of new business success is attributable to the personal networks of entrepreneurs (Baron and Markman 2003, Witt 2004) and their ability to manage and coordinate resources (Chandler and Hanks 1994). Armed with useful ties and contacts, a manager "becomes an entrepreneur in the literal sense of the word—a person who adds value by brokering the connection between others" (Burt 1997 : 342). Overall, the existing findings seemed to fit well with the conventional wisdom on the importance of personal connections in China, which is summed up by the statement "Who you know is more important than what you know" (Yeung and Tung 1996 : 54). As such, top managers in China cultivate two specific types of ties (Luo and Chen 1997, Peng 1997); with executives at other organizations, such as suppliers, buyers, and competitors (Dubini and Aldrich 1991) and with the government officials (Luo and Chen 1997, Chen 2007, Wu and Chen 2012).

According to the above discussion, social ties facilitate inter-organizational partnerships in many ways. They act as a source of information facilitating partner search, deliver the influence necessary to create interest, provide informal power over decisions and choices, provide access to new opportunities and resources that are otherwise not accessible, and predispose organizations to act collectively. An actor that is central in a network of social interactions likely has greater potential to formally collaborate with other actors because of its locational advantages in the network. Therefore, we propose the following hypothesis.

Hypothesis (H4): The degree of inter-organizational social interactions of an organization will be positively associated with its formal, strategic inter-organizational collaborations.

b) Relational Dimension and IOC

The **relational dimension** of social capital refers to assets that are rooted in relationships, such as trust and trustworthiness (Putnam 1993, Tsai and Ghoshal 1998, Fukuyama 1999). Relational assets such as trust develop through a history of

interactions (Granovetter 1992). Trust can act as a governance mechanism for embedded relationships (Uzzi 1996). It serve as a motivation for individuals to act collaboratively toward others (Yang, Lee et al. 2009). Collaboration usually requires a deeper trust relationship to ensure that both collaborators do what they have promised to do (Casson 1995). In the case of high trust, the expectations that others will reciprocate are high and people tend to follow the civic norms (Knack and Keefer 1997). Institution-based trust reflects the security one feels about a situation because of guarantees, or other impersonal structures (Zucker 1986). Among the other facets of this dimension are norms and sanctions (Coleman 1988, Putnam 1993), obligations and expectations (Granovetter 1983, Coleman 1988, Burt 1997) and identity and identification (Håkansson and Snehota 1995).

Trust has been viewed as an important aspect of organizational context (e.g. Ghoshal and Bartlett 1994) and as an antecedent of cooperation (e.g. Ring and Van de Ven 1994, Gulati 1995). The perceived trustworthiness of a unit among other units is positively associated with its resource exchange with other units within an organization (Tsai and Ghoshal 1998).

In the context of IORs, relational social capital is identified as a vital resource, which **facilitates motivation, partner selection and collective decisions**. The significance of trust in developing long-term relationships has been emphasized in the alliance literature (Ring and Van de Ven 1994, Parkhe 1998, Jennings, Artz et al. 2000, Nooteboom, Van Haverbeke et al. 2007). Indeed, trust is considered the "cornerstone of strategic partnership success" (Spekman 1996). Trust can benefit inter-firm collaboration by increasing efficiency and reducing cost (Dyer and Singh 1998, Nooteboom 2004). In a review of inter-organizational trust, Seppänen et. al. (2007) identified trust as a multi-dimensional, reciprocal and context-specific concept and identified some common indicators of trust between two parties: competence, reliability, predictability, contractual trust, lack of dependence, and information sharing. The existence of trust in a relationship reduces the perception of risk associated with opportunistic behaviour (Moore 1998). Thus, trust can facilitate exchanges in alliances (Koka and Prescott 2002) and can induce joint efforts (Bstieler, Hemmert et al. 2015). Partners that trust each other generate greater profits, serve

customers better, and are more adaptable (Kumar 1996). Barney and Hansel (1994) argue that when exchanges are governed by trust, the transactors can reduce transaction costs (e.g. bargaining and monitoring costs). A buyer's trust in a supplier firm is associated with reduced negotiation costs, reduced conflicts and better supplier performance (Zaheer, McEvily et al. 1998). Studies suggest that one critical factor determining alliance performance is the degree of trust between alliance partners (Smith 1997). Relational capital is seen as more influential for complex, uncertain, or tacit knowledge in IORs, compared to structural social capital (Hansen 1999, McEvily and Marcus 2005). While inter-organizational ties may originate because of interpersonal trust, the success of inter-organizational cooperation also depends on inter-organizational trust (Zaheer, McEvily et al. 1998). Distinguishing between interpersonal trust between two boundary spanners and inter-organizational trust, Zaheer, McEvilly, and Perrone (1998) identified that a boundary spanner on one firm trusts the other firm, not a an individual.

Without trust and shared norms of behaviour, sharing knowledge, combining skills, and making large joint investments are likely to be difficult and unproductive in any context (Coleman, 1988). Relational aspects may have a greater impact on **economic outcomes in the developing contexts.** Different cultures may have different attitudes to trust (Kuada and Sørensen 2005, Vilana and Monroy 2010). Trust is believed to play a more important role in business dealings in East Asia (Boisot and Child 1988). Intangible aspects such as 'Guan Xi', which relates to the relational dimension (Nahapiet and Ghoshal 1998), play a vital role in Chinese inter-firm collaboration (Lu, Huang et al. 2006, Su, Yang et al. 2009, Jia and Rutherford 2010) As suggested by Luo and Chen (1997), the guanxi network is able to enhance a firm's competitive advantages by providing access to resources of other network members. Personal connections and loyalties sometimes outweigh the importance of organizational affiliations and legal proceedings (Luo and Chen 1997).

A particularly strong theme of research concerning social capital and IORs, is the role of social capital in establishing **reputation**. Bradach and Eccles claimed that "trust is a type of expectation that alleviates the fear that one's exchange partner will act opportunistically" (1989: 104). As trusting relationships develop inside a network,

actors build up reputations of trustworthiness that may become important information for other actors in the network. Affective qualities such as 'Social solidarity' obtains among individuals when there exists a degree of mutual trust and commitment among them, thereby shaping the capacity for cooperative and collective action (Sandefur and Laumann 1998). Biggart and Delbridge (2004) suggest that exchanges can be based on social solidarity, shared identity, and bonds. Actors' reputations are constructed in part from the identities of their associates. This is especially important where the quality of potential partners is difficult to establish or unknown (Stuart, Hoang et al. 1999). In the absence of direct experience, an actor's reputation is established through the prominence and status of their associates, who provide proxy measures of quality and potential for success (McEvily, Perrone et al. 2003). This is in line with the idea of 'trust transferability' in which initial trust impressions are based in a source other than the trustee (McEvily, Perrone et al. 2003). Here, "*a third party confers to each person a definition of the other as trustworthy. Each accepts or rejects this definition...largely on the basis of his trust for the third party's judgement*" (Strub and Priest 1976).

Norms of reciprocity is also an important aspect in inter-frim partnerships. Reciprocity, refers to the expectation that exchange will be mutual (Powell, Koput et al. 1996, Uzzi 1997). Obligation is viewed as reciprocity on a mutual basis such as the readiness to return a favour with a favour (Pezzoni, Sterzi et al. 2012). Putnam (1993) described generalized reciprocity as the principle that operates when a person does something of value for you without expecting anything immediately in return, '*in the expectation that down the road you or someone else will return the favour*' (1993 : 37). He argues that a society that relies on generalized reciprocity is more efficient, more trustful, and more open to collaboration. Baker (2000) sees reciprocity as a powerful principle under pinning social exchange across a wide range of social contexts, including IORs. It is this principle which creates the possibility to move exchange from a world of primarily short-term, individualistic, and instrumental actions to a more social and enduring basis for exchange relations. In the context of IOR, when there is a pre-existent, mutual or reciprocal trust between two organizations, they are more likely to work cooperatively. The norm of generalized reciprocity resolves problems of collective action and binds communities (Adler and

Kwon 2002). Similarly, an organizationlocated centrally in inter-organizational mutual trust network is more likely to be popular in selection of partners.

When two parties begin to trust each other, they begin to lower the walls of self-defence against potential opportunistic behaviour from others. Hence, they become more willing to share their information, resources and knowledge, thereby allowing space for cooperative or collective behaviour. Therefore, it is reasonable to anticipate that a more trustworthy actor is more likely to be a popular partner in the 'partner selection' stage. Hence, differences in levels of perceived trustworthiness may cause different levels of formal collaborations among organizations. This discussion leads to the following proposition;

Hypothesis (H5): The level of an organization's perceived trustworthiness will be positively associated with its formal, strategic inter-organizational collaborations.

c) Cognitive Dimension and IOC

Cognitive dimension of social capital is typically concerned with and shared perceptions or understandings between actors. Shared understandings enable smooth transactions between actors in social networks. Shared understandings between actors may be attributed to shared visions and goals, shared work norms and shared knowledge or experiences. If two actors share common interests, beliefs, goals, and/or culture, they are more likely to form connections. The notion of Homophily is observable in this phenomenon. Homophily refers to the similarity of two agents within a network.

In the context of IORs, a shared understanding is characterised by shared goals and visions, shared knowledge and shared norms among the organizations. Shared understandings enable effective communications, better exchange of knowledge, collective decisions and effective conflict resolution. The findings of a study undertaken by Bucklin and Sengupta (1993) indicate that compatibility of the partners is critical to alliance success.

The **common goals or interests** may also help them to see the potential value of their partnerships. As a result, organizations who share a vision will be more likely to become partners. We can view a shared understanding as a bonding mechanism that helps different organizations to collaborate. In an organizational study, Tsai and Ghoshal (1998) revealed that units that shared a common vision with other units and with the overall vision of the firm did better in inter-unit resource exchanges. Several studies have shown that a shared vision (or a similar construct, such as goal congruence) may hold together a loosely coupled system and promote the integration of an entire organization (e.g. Orton and Weick 1990). Considerations such as domain similarity and goal compatibility have been found to enhance the effectiveness of inter-organizational relationships (Ruekert and Walker Jr 1987).

Shared norms have been linked to effective cooperation (Arregle, Hitt et al. 2007) and promotion of greater knowledge assimilation (Kreiner and Schultz 1993). The collaborative capacity of organizations depends on the degree that organizations share norms and values and are prepared to lower individual interests to those of larger groups (Macke, SARATE et al. 2010). In a study of the UK health care sector, Ferlie et al. (2005) found that both social and cognitive factors accounted for the spread of innovations in multi-professional organizations. When professionals had a foundation of shared identity and values that encouraged their take-up of new treatments leading to effective spread of innovations.

Availability of **common understandings** among organizations has been identified as an enabler of collaboration between Universities and Industries (Al-Tabbaa and Ankrah 2016). Ahwireng-Obeng (2001) identified that the similarity of perceptions regarding the alliance performance determinants and the strong expectation about high future benefits, influence the success of alliances between large and small organizations. The effective collaboration requires organizations to be able to identify, interpret and exploit the new knowledge (Cohen and Levinthal 1990, Nooteboom 2000). Cognitive and relational social capital particularly more influential for complex, uncertain, or tacit knowledge (Hansen 1999, McEvily and Marcus 2005) compared to other dimensions.

In IORs, Boschma (2005) defined the term **'cognitive proximity'** as the extent to which two organizations share the same knowledge base. Cognitive proximity enable organizations to identify, interpret and exploit new knowledge (Cohen and Levinthal 1990, Nooteboom 2000). It means that organizations sharing the same knowledge base can learn more easily from each other than if cognitive distance is large. Nooteboom et al. (2007), demonstrated that cognitive proximity is indeed an important determinant in R&D alliances. Some organizations act as hubs, while others poorly connected because they lack the capabilities to understand and exploit external knowledge (Giuliani and Bell 2005, Boschma and Ter Wal 2007, Morrison 2008). The above discussion leads to the following proposition:

Hypothesis (H6): The extent to which an organization has a shared understanding with other organizations will be positively associated with its formal, strategic inter-organizational collaborations.

3.3.2.3 Literature-based Model

To investigate the enabling role of social sapital in inter-organizational collaboration in the Sri Lankan banking industry, this research develops a conceptual model as shown in the figure 3.1, based on the review of the related literature. The conceptual model hypothesizes that structural, relational and cognitive dimensions of Social Capital support the collaboration among organizations. Those hypotheses are defined as H1, H2, H3 H4, H5 and H6 respectively.

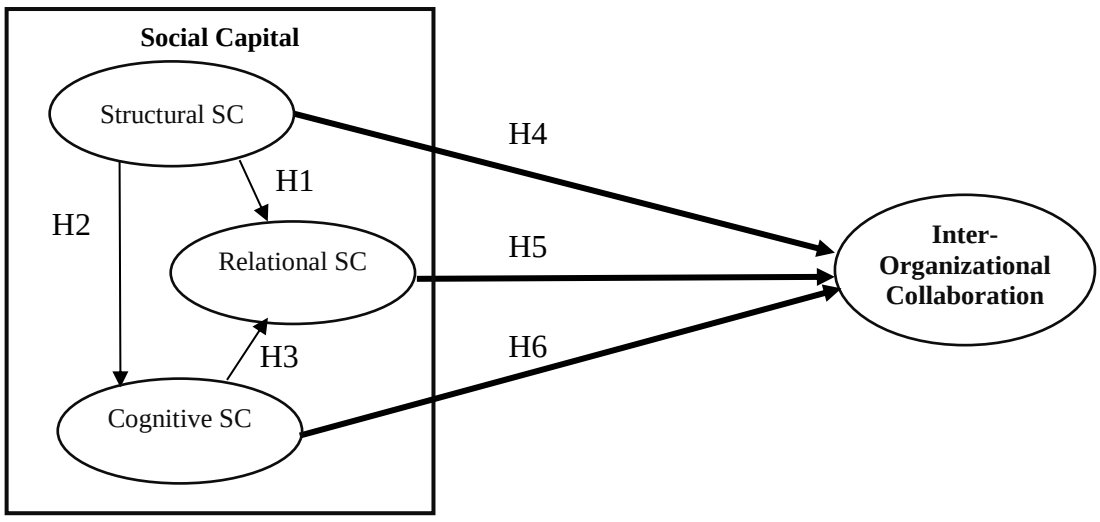

Figure 3.1 : Model of Social Capital based Inter-Organizational Collaboration

3.3.2.4 The Outline of Social Capital based IOC

According to the above discussion, the three dimensions of social capital play a valuable role in enabling inter-organizational collaborations. The figure 3.2 summarizes the above discussed literature and presents a conceptual framework of how different dimensions of social capital contributes to the inter-organizational relationships building.

	MOTIVATION	**PARTNER SELECTION**	**NEGOTIATION**	**IMPLEMENT**
STRUCTURAL	• Information channels spread success and failure stories. • Contacts bring new opportunities. • Social network influence to collaborate. • Social needs such as prestige, and acceptance motivate to collaborate. • Dense networks prevent opportunistic behaviours	• Social networks act as information-gathering tool/ bringing complete, diverse, rich, relevant, timely and trustworthy information about potential partners, opportunities, clients etc. • Contacts enable access to 'opportunities'	• Leading firm's social power, status, identity help achieve conformity with multiple partners. • Brokers have negotiation power. • Social networks allow fine grained information transfer leading to better transparency.	• Social links with external stakeholders and authorities reduce delays in processing and soften certain administrative hurdles.
RELATIONAL	• Pre-existing trust reduce perceived risks and creates behavioural intention to collaborate. • Social solidarity enable perceptions of ease of working together. •	• Pre-existing trust reduces fear of opportunistic acts. • Contacts can broker trust. • SC provides credentials to firm's social standing. • Reciprocal obligations, norms reduce fear of conflicts.	• Trust reduces uncertainty in decisions. • Trust reduces conflicts during negotiations. • Trust reduces 'Risks' in inter-firm collaboration.	• Pre-established trust, reduce the need to verifications, documentation and reduce delays in processing.

COGNITIVE			
• Collective visions, interests motivate organizations to collaborate. • Perceived cognitive proximity motivate collaboration.	• Norms such as reciprocity influence partner selection (reciprocate prior opportunities). • Perceived shared understandings between potential partners may bridge the compatibility gaps and background differences.	• Shared understandings enable effective communication, transfer of tacit knowledge, joint problem solving. • Shared norms enable effective cooperation, resolves problems of collective action, reduce compatibility gaps	• Shared understandings enable increased efficiency, reduce cost of transactions.

Figure 3.2 : Conceptual Framework of SC-Driven IORs

3.3.3 Moderating Effects

3.3.3.1 ICT Capabilities

Organizations in the financial industry heavily depend on technologies that support faster, efficient and secure transactions and services. However, the growth of collaborative technologies poses both prospects and challenges for financial institutions. While the collaborative technologies promise many benefits such as efficient and improved services, the potential to attract clients, the ability to effectively manage risks, the ability to integrate different systems and strengthened interactions with stakeholders through faster messaging, efficient sharing of documentation, technology may also pose risks due to the banking regulations, compliance, and security concerns. This pressure between the encouragement and resistance towards collaboration is central to the evolution of banking organizations over the next decades and it is pertinent to understand the effects of ICTs on IORs in more detail.

The theory proposed in this study conceptualize that the ICT capability of organizations positively moderate the relationship between social capital and inter-organizational collaboration. Success of IOCs, depends on conditions such as motivation, ability to identify suitable partners, ability to make collective decisions and ability to maintain the link. In practice, partnerships also face many obstacles due to the large heterogeneity of the participants (in terms of their technological infrastructures, business practices, culture, etc.), as well as the time needed to build trust. The rapid development of ICT, have made it easier and more efficient to build and use inter-organizational networks. ICTs enable interaction across time, space and contextual boundaries (Yang, Lee et al. 2007), provide better access to required information (Koka and Prescott 2002), reducing interaction costs (Butler, Hall et al. 1997), and facilitate “quick connect capabilities” (Sanchez and Mahoney 1996) of actors in the value chain. ICTs also increase the use of modular product architectures as a way to compose distributed production processes (Sanchez 1995). As such, today’s inter-organizational collaborations largely rely on support such as strong ICT infrastructure.

ICTs effect on social capital formation and maintenance has been a point of attention for the Information Systems researchers. However, the link between ICT and social capital is still unsettled (Shim and Eom 2009). Some have argued that ICT can increase social capital at a relatively low cost (Lin 2001, Wellman, Haase et al. 2001). For example, ICTs has been found to increase the closeness of partners in inter-organizational relationships (Bensaou 1997, Stump and Sriram 1997, Subramani 2004). Some scholars have suggested that ICT might exert a negative impact on social capital (Putnam 1995, Kraut, Patterson et al. 1998). The effects of ICT on social capital therefore is more of an empirical question, one which needs to be explored in greater detail, especially in the specific contexts. If ICT turns out to have significant effects on social capital, then perhaps ICT has the potential to indirectly support inter-organizational collaboration by enhancing social capital as well as having a direct impact on inter-organizational collaboration. The following section harness the existing literature on how ICTs may influence the effects of structural, relational and cognitive dimensions of social capital towards the IOC.

a) ICT and Structural Dimension

The collaborative associations are interactive and adaptive in nature (Anderson 1990). The social capital literature highlights the importance of social interaction in building and maintaining social capital (e.g. Bourdieu 1986, Burt 1993, Lin 1999, Putnam 2000). It is important to investigate the ways in which ICT could enable social interactions across boundaries of time and space. Markus and Robey (1988) argued that ICT may affect both individual and collective social capital. The influence of ICTs on social capital formation is evident in literature. Kim et al (2016) found that the use of social media in disaster recovery, correlates positively with the perceived level of organizational resilience and community emotional responses. Technological skills and managerial capabilities are particularly relevant for guanxi development in Chinese firms (Park and Luo 2001), such that the organizations with superior technological capabilities depend less on guanxi networks for securing deals compared to those with poor technological skills.

ICT may facilitate **frequent and easy ways of communication** between partners **across time and space** (Yang, Lee et al. 2007). ICTs such as mobile technologies, are developed to extend human communication capability by breaking through the limits, such as time difference and geographical distance, and enables human interaction greater mobility than ever before (Ling, Haddon et al. 2001). Interaction is the precondition of maintenance and recreation of social capital at both individual and collective levels (Lin 1999) (Lin 1999). First, ICT enables people not only to exchange information faster, but also communicate with people while doing something else. It potentially facilitates users' social interaction, enabling social capital formation (Putnam 2000). Modern-day human interaction is highly mobilized (Kakihara and Sorensen 2002) where people now deal with several things at the same time (Hall 1983, Kakihara and Sorensen 2002). Secondly, certain features of ICT also indicate great potential in enhancing users' spatial mobility (Kakihara and Sorensen 2002). The construction of social networks helps people overcome interaction difficulties caused by spatial separation (Cook and Weigel 1983, Kakihara and Sorensen 2002). Wellman et al. (2001) views wireless communications as a new phase in social networking. They also show that Internet activity supplements interactions with others, increases activity in civic and political groups, and is associated with a sense of community with the general on-line community. Kakihara and Sorensen (2002) argue that ICT, particularly mobile technology, is continuously reshaping human interaction. Thirdly, ICT can also increase users' contextual mobility, and make interaction easy by conquering some contextual obstacles in face-to-face interaction such as cultural background, particular situation or mood, degree of mutual recognition, and so on. Unlike in face-to-face interactions, using ICT mediated communication enable people to easily interact with others regardless of the contexts (Kakihara and Sorensen 2002). Teenagers may prefer to use SMS when in public. They further argue that computer mediated communication can provide people with access to a wider range of weakly tied actors and a wider set of contacts.

Many scholars agree that ICT **lowers interaction costs** both within the firm as between organizations (Malone, Yates et al. 1987, Hitt 1999) and this leads to lower coordination costs. Subramani (2004) show that IT decreases transaction costs between buyers and suppliers and creates a more relational/cooperative governance

structure. Reduction of interaction costs makes it cheaper to maintain inter-organizational relationships as it enables organizations to maintain more relationships with fewer resources. This reduction of interaction costs is due to standardization of communication (Butler, Hall et al. 1997). The Internet has made an important contribution to standardized communication. ICT have been associated with increases in efficiency (Brynjolfsson, Malone et al. 1994).

ICT based networking also facilitate **faster and richer flows of information** which is useful for decision making regarding partner choices etc. in IORs. A network can serve as an information-gathering tool (Freeman 1991) an information-processing or screening device (Leonard 1984). Social capital yields three different kinds of information benefits to organizations in strategic alliances: information volume, diversity, and richness (Koka and Prescott 2002). The relevance, timeliness, and trustworthiness of the information available through social contacts, makes it especially useful (Baker 2000, Burt 2005). High levels of social capital enable better use of development opportunities (Putnam 1993), due to increased information that facilitate the action (Coleman 1988, Fukuyama 1999).

At the same time, the existence of IT creates **networking infrastructure** such as that encourages the formation of social capital (Calabrese and Borchert 1996). Inter-organizational System (IOS) can be formed as an extended form of networking infrastructure between organizations. An IS can be viewed as a social artefact, and as such, a technical implementation of social systems (Hirschheim, Klein et al. 1995: 11). Such systems may streamline and systematise operational communications saving time for more useful and communications such as collective decision making. It may also decrease the communication and transaction costs. Therefore, the availability of IOSs may increase the chance of further inter-organizational collaborations.

Modularization of ICT products (software) may also lead to an increased use of inter-organizational networks (Langlois and Robertson 1992, Schilling 2000, Schilling and Steensma 2001, Sturgeon 2002). Modularization is breaking down a product in core blocks of functionality. Thus, modularity allows components to be produced by separate organizations and used interchangeably in different configurations. Once an

organization adopts a modular product architecture it can adjust its firm to mirror the creation and production of these components. Modularization of products increases the options to ally with other organizations (Jacobides and Billinger 2006). Therefore, the number of organizations to choose from with whom to collaborate increases as modularization becomes increasingly more important (Brusoni 2005). An organization will have a more diverse set of organizations to choose from when these organizations modularize their products and processes.

In sum, ICT may strengthen the effect of structural SC over IORs by enabling communication over time, space and contextual barriers, reducing communication costs, faster information gathering, streamlining regular communications and increasing chances of partnering through modularization capability of software products.

Hypothesis (H7): ICT capability will positively moderate the relationship between the structural social capital and inter-organizational collaboration.

b) ICT and Relational Dimension

Trust plays a key role in any organizational relationship (Chae, Yen et al. 2005). Trust doesn't evolve overnight. It usually takes time and unfolds "from the inside". Trust between parties may be affected by the ICTs. The literature provide evidence that ICT supports good governance (Basu 2004), improves accountability (Wong and Welch 2004, Yang and Rho 2007) and reduce corruption (Shim and Eom 2009) by transforming both the internal processes and external relationships (Chawla and Bhatnagar 2001, Im and Jung 2001, Bhatnagar 2003, Im 2003). There are several ways in which ICT may positively affect the building and maintenance of trust in IORs.

First, ICT may facilitate frequent, easy, cost all effective and multiple ways of communication between partners. When two partners frequently communicate with each other, it enables them to be more informed, closer and able to predict behaviour of other party. Mohr et al. (1996) recognize the importance of communication in IORs. Bakos and Brynjyoolfsson (1993) propose that IT deployment in supply chains leads

to closer buyer-supplier relationships. Stump and Sriram (1997) provide empirical evidence that the use of IT is associated with the overall closeness of buyer-supplier relationships. Grover et al. (2002) suggest that the use of IT within the dyad could encourage the commitment to establishing relational behaviour.

Second, ICT may help in establishing initial trust between unknown partners through facilitating faster and easy access to information on partners during the initial stages which in turn may increase overall visibility and reduce uncertainty. A popular belief is that ITs can increase the information processing capabilities of a relationship, thereby enabling greater interfirm cooperation in addition to reducing uncertainty (Bensaou 1997, Subramani 2004). A number of research on electronic data interchange (EDI) revealed a positive link between EDI and buyer-supplier relations (Sriram and Banerjee 1994, Vijayasarathy and Robey 1997).

Third, ICT may facilitate secure ways of communication between partners allowing them to share critical information more openly. Successful buyer-supplier relationships are associated with high levels of information sharing (Cannon and Perreault Jr 1999). Information sharing (quality and quantity) refers to the extent to which critical and proprietary information is communicated to one's partner. More open and collaborative information sharing indicates the commitment and willingness of both parties to share important, even proprietary information (Cannon and Perreault Jr 1999)

Moreover, in the globalized economy, an organization with high ICT capacity may be viewed as prestigious, and may become an attractive candidate in IORs. On the same line, such may better comply to international and industry standards thereby appearing more competent and therefore trustworthy partners. Organizations that exhibit readiness for IOSs indicate long term commitment and transparency leading to more trustworthiness. For example, high ICT banks may better adopt to industry-wide process automations such as payment and settlements. Information about norms and trustworthiness is believed to flow more easily within this more densely connected network, thereby increasing social capital (Coleman 1988, Putnam 1995).

In sum, ICT may strengthen the effect of relational dimension of SC over IORs by providing increased visibility between potential partners through effective communication and means of information sharing and by acting as a source of attractiveness as a potential partner.

Hypothesis (H8): ICT capability will positively moderate the relationship between the relational social capital and inter-organizational collaboration.

c) ICT and Cognitive Dimension

ICTs may support creation of shared knowledge and shared visions. In the "resource-based" view of a firm, knowledge is considered to be the most strategically critical resource (e.g. Conner and Prahalad 1996, Grant 1996, Nahapiet and Ghoshal 1998).

In IORs, Boschma (2005) defined cognitive proximity as the extent to which two organizations share the same knowledge base. The organizations that are already closer to each other through technologies may therefore have a better chance of partnering than those who are technologically distant. The cognitive distance between organizations can be bridged through the use of technology. The ICT supported communication enable unification of concepts such as shared meanings and shared procedures or processes. In the case of IOSs or industry wide ICT standards, this is essentially the case. That, in turn, may serve as a precondition for the formation of shared explicit knowledge such as best practices. Availability of shared knowledge may help the members understand and accept new ideas. As a result, this knowledge may form the basis for social interaction and alignment. Overall, ICTs may contribute to the formation of a common knowledge space for collaboration, and hence, the growth of social capital. Such unifications allow more easy and fruitful conversations between parties leading to better IORs.

Shared knowledge, standards and ICT together may enable to form inter-organizational links in a very short time frame (Van Liere, Hagdorn et al. 2004, Vervest, Van Heck et al. 2004, Chatterjee 2006, Van Liere, Hoogeweegen et al. 2006). This is referred to as "quick-connect capability" (Sanchez and Mahoney 1996).

Standardization of inter-organizational communication is an important prerequisite for a quick connect capability (Van Liere, Hagdorn et al. 2004). A quick connect capability consists of two aspects: 1) a technological infrastructure that facilitates the communication, exchange of information and transactions and 2) an inter-organizational system (IOS) that connects the two organizations. Although this is a costly and difficult process of mutual adaptation and compatibility, benefits (such as reduction of errors, increased efficiency through the elimination of re-entering data) will increase as more organizations adopt it. Consequently, an organization can expand its network range (Reagans and McEvily 2003) (its diversity of resources, assets, and information) by establishing new ties. Summarizing, quick connect capabilities make it easier to establish inter-organizational relationships.

In sum, ICT capability may strengthen the effect of cognitive dimension of SC on IORs by providing unified communication, shared knowledge spaces and quick connect capability. Also, the idea of 'shared understandings' representing the shared visions, norms and knowledge reflects 'overall cognitive proximity' of an organization to other organizations which could be positively influenced through the use of ICT.

Hypothesis (H9): ICT capability will positively moderate the relationship between the cognitive social capital and inter-organizational collaboration

3.3.3.2 Other Moderators

In addition to the strengthening effect of ICT over the drive of Social capital towards IOC, there may be other factors that strengthen or weaken the observed effect. In this study, the moderating tendency of the following factors are also investigated.

a) Firm Size

Firm size is an important attribute that shapes behaviours of a firm (Nadler and Tushman 1989). Some researchers have found that firm size or size difference between collaborating firms play an important role in the partnership formation process and collaborating behaviour. Firm size is a measure of a firm's capacity to cooperate and a measure of its capacity to do without cooperation. It also affected the performance and

success of collaboration (Shan and Hamilton 1991, Burgers, Hill et al. 1993). Some researchers believe that the formation of inter-firm collaboration increases with the size of a company because of the broader basis for potential collaboration, lower barriers to entry, higher network density, lower costs, and internationalization (Duysters and Hagedoorn 1995, Hagedoorn 1995, Dussauge, Garrette et al. 2000). Some have argued that different sized firms are more likely to form alliances (Gulati 1995, Saxton 1997). Powell and Brantley (1991) found that the frequency of cooperative relationships more than proportionally rises with size. Hall and Weiss (1967) show a positive relationship between absolute firm size and profitability due to enhanced scale and scope efficiencies. A study of Chinese organizations shows that the larger firms performed better than smaller firms (Acquaah 2007). Organizational survival and performance improve as a firm becomes larger (Singh, Tucker et al. 1986). Large firms have more favourable access to capital. In banking domain, large organizations with large asset bases may be in a better position to participate in syndication loans.

However, other researchers have argued that firm size does little to contribute to the performance of inter-firm collaboration (Oxley 1997, Park and Ungson 1997). On the other hand, some researchers present empirical evidence that small firms are more likely to cooperate with other firms than large firms (Shan and Hamilton 1991). With the size increases, so do the bureaucratic structures, thus making it difficult to have a personal, entrepreneurial style of management. Large firms thus have few incentives to seek external support. Felzensztein and Gimmon (2007) argued that small firms are more active in building inter-firm ties. Small firms look for external partnerships to overcome the lack of key resources and technologies. In China, small firms had little bargaining power with the government, subjecting them to frequent government intervention and hindrance (Perkins 1994). In China, Guanxi networks serve as a primary mechanism for small firms to overcome the liability of their size and other competitive disadvantages (Xin and Pearce 1996, Park and Luo 2001). These conflicting results may be due to different datasets. It can be argued that the key determinants could vary between different countries, industries, and sample groups.

Firm size is usually measured by firm's total assets, annual sales or turnover, capital returns, and/or employee numbers of the firm in previous research (Park and Ungson 1997, Hagedoorn and Duysters 2002, Singh and Mitchell 2005). However, the definition of firm size is different in each country and even in different industries (Harvie and Lee 2002). For example, the definition of firm size in Australia is different in the agriculture and service sectors (ABS 2012). Both Australia and China define firm size on the basis of number of employees (Zhang 2014). Some of the previous empirical studies exclude the majority of micro and small sized firms from analysis. In the banking domain, number of employees, number of branches, and total assets could be indicators of the firm size. For this study, the firm size was measured using the total assets and the number of employees in Sri Lanka as disclosed by the organizations in their annual reports.

Hypothesis (H10): Firm size will moderate the relationship between social capital and inter-organizational collaboration.

b) Ownership

Economic activities are shaped within the institutional framework because such a framework dictates which organizational actions are accepted and supported (Aldrich and Fiol 1994). Accordingly, the institutional framework places constraints on the firms' strategic choices (Peng and Heath 1996). Organizations also react differently in adapting to institutional pressures (Oliver 1991). The factors such as firm's ownership may have a great impact in this regard. While private firms have grown quickly, control of financing and key scarce resources largely remain with the state. Therefore, the private firms compete with state-owned firms for scarce resources (Park and Luo 2001) . Private firms also faced a great deal of political uncertainty. Their survival depended on the unreliable market rules of the game set by the government. A study in China shows that private firms nurture a long-term-based reciprocal relationship with local governments through various formal and informal ties (i.e., guanxi) to economize on transaction costs (Park and Luo 2001). Guanxi with local governments also helps firm settle negotiation deals (Pye 1995). Therefore, Nonstate-owned firms are more likely to benefit from external social ties to access opportunities (Park and Luo 2001) such as business partnerships than state-owned firms. Moreover,

organizations may prefer to partner with organizations of the same ownership category in order to avoid potential inefficiencies of administrative and policy differences. On the other hand, private organizations may be interested in partnering with state owned organizations to add value such as credibility to the alliances. In this research, firm ownership was operationalized using a dummy variable, coded 1 for state owned firms and 0 for other organizations.

Hypothesis (H11): Firm ownership type will moderate the relationship between social capital and inter-organizational collaboration.

c) Location of Head Office

The geographically bounded nature of social capital has been established. Scholars have identified that investment predominately occurs with actors within physical proximity (Monge and Contractor 2003, Tura and Harmaakorpi 2005). Proximity is a popular concepts of social network studies. It is argued that social network analysis can be fruitfully embedded into the discourse of economic geography and spatial clustering within an industry (Ter Wal and Boschma 2009). The proximity concept has captured a prominent position in the literature dealing with inter-organizational collaboration (IOC) (e.g. Sternberg 1999), innovation (e.g. Oerlemans, Meeus et al. 2001) and regional economic development (e.g. MacKinnon, Cumbers et al. 2002). In general, the research that focus spatial characteristics on economic activity fall into two categories. Both 'industrial agglomeration' and 'spatial proximity' are concerned with the spatial distribution of economic activity with a different focus (Vissers and Dankbaar 2016). The **proximity perspective** (Glaeser and Kohlhase 2004, Boschma 2005, Torre and Rallet 2005, Knoben and Oerlemans 2006) examines geographical distance as a factor that may have a profound effect on the collaboration between economic actors. The **territorial perspective** (Moulaert and Sekia 2003, McCann and Van Oort 2009) is focused on whether these actors are located in the same territory such as an administrative region, often in the attempt to improve the conditions for economic growth.

In the **proximity perspective,** geographical proximity can be defined as the physical distance between actors in absolute (e.g. miles) or relative terms (e.g. travel time)

(Boschma 2005). There is a strong claim that geographical proximity is a prime mover of network formation despite globalization, implying that a great deal of interactions still take place between agents that are geographically proximate (e.g. Weterings and Boschma 2006, Hoekman, Frenken et al. 2009). Geographical proximity enables easier and cheaper face-to-face interactions. Spatial proximity often leads to informal communication (Kraut, Egido et al. 1988) and greatly enhances both the frequency and the depth of social interaction Rutten, et al (2010).

Collaborations often begin with informal conversations between colleagues (Edge 1979). Katz (1997) found that co-authorship decreases exponentially with the distance between institutional partners. Individuals are more likely to be friends if they are geographically close (Feld and Carter 1998). A study in the US found that "Board interlocks are concentrated in organizations headquartered in the same locale" (Kono, Palmer et al. 1998). Some researchers specifically focus on geographic space and the effects of proximity on inter-organizational collaborative networks, for example, in immediate disaster response networks (Bevc, Barlau et al. 2009). The need for geographical proximity (or face-to-face interactions) may be realized by temporary co-location (bringing agents together by means of business meetings etc.), instead of permanent co- location (Torre and Rallet 2005). Watts et al. (2003) find, many organizations in close proximity do not necessarily share face-to-face interactions through either social or business contacts, reducing the scope for knowledge access.

The **territorial perspective** explains the advantages of firms being located in a favourable region, close to each other (Vissers and Dankbaar 2016). There is evidence that social capital within a localised environment facilitates the connection of knowledge (Capello and Faggian 2005, Tura and Harmaakorpi 2005). Favourable location becomes a source of competitive advantage for occupants (Barney 1996). There are wide variations in the level of economic development across regions, especially in developing countries. Favourable, central locations offer various benefits to organizations, like infrastructure support and investment incentives in these areas allow for lower operating risks and higher efficiency. Businesses tend to be concentrated in these areas compared to regional areas. Organizations in central areas have better chances of collaborating with each other for common purposes.

Collaborating with partners in geographic proximity avoid the difficulties and risks of collaborating across space and time. In a study of intra-organizational networks in knowledge-intensive environments, Sailer and McCulloh (2012) shows that if two nodes are geographically closer, there is a higher likelihood that they will form a link. On the other hand, organizations in more centralized economic areas face enhanced market competition and tend limit connections to arm's-length transactions to avoid risk of exposure of competitive strategies (Oerlemans, Meeus et al. 2001). In clusters with high levels of industrial concentration, inter-firm competition will often outweigh collaboration. The organizations in less open economic regions are more likely to rely on personal ties with the business community and government authorities (Park and Luo 2001) to compensate for constraints and disadvantages in the operating environment (Punnett and Yu 1990).

In summary, the organizations that are located geographically closer to each other may therefore have a better chance of partnering than those who are located at a distance. As such, it can be expected that geographical proximity may strengthen the effect of social capital on inter-organizational collaboration. To account for this, firm location was operationalized using a dummy variable, coded 1 for organizations having head office in the City of Colombo and 0 for organizations having head office in any other less concentrated cities.

Hypothesis (H12): Geographic proximity will moderate the relationship between social capital and inter-organizational collaboration.

d) Firm Age

Organizational history is also an important determinant of legitimacy, strategic behaviours, and guanxi cultivation (Park and Luo 2001). History shapes the organizational culture by affecting values and beliefs over time. It takes time for an organization to acquire institutional legitimacy among its members and to become valued in its own right. Organizational age reflects institutionalized managerial attitudes and beliefs (Baker and Cullen 1993). Young organizations are subject to the liability of newness because routines are rarely perfected and stabilized, organizational politics are unstable, and links with key actors in the environment are irregular.

On the other hand, older organizations are highly entrenched with bureaucratic rules and systems, and lack entrepreneurial values to adapt dynamically to environmental changes (Park and Luo 2001). In China, newer firms actively utilize guanxi networks than older firms, to compensate for their lack of legitimacy and competitive resources (Park and Luo 2001). Guanxi also provides newer firms with risk reducing capabilities (Park and Luo 2001). Young organizations in China, are more entrepreneurial than are older organizations (Park and Ungson 1997). In this research, firm age was measured as the number of years since the formation or incorporation of the firm.

Hypothesis (H13): Firm age will moderate the relationship between social capital and inter-organizational collaboration.

e) Previous Experience

Some researchers have found that Success of inter-firm collaboration is due to a large extent to a firm's previous experience and history (Saxton 1997, Dyer and Singh 1998, Anand and Khanna 2000, Hagedoorn, Kranenburg et al. 2003). The more experience a company has in formal alliances, the more opportunities there are to enter into future partnerships (Harrison 2004, Zacharia, Nix et al. 2011). The results from a qualitative study in the telecommunications industry in Australia and China also shows that the previous experience is important for current inter-firm collaboration (Zhang 2014). A firm's historical and cultural conditions may pose risks to inter-organizational collaborations (Kuada 2002, Das and Rahman 2010, Jia and Rutherford 2010). Others have argued that experience only contributes to certain types (same partner, same type, or within a short period) of collaboration (Saxton 1997, Zollo and Winter 1999). Anand and Khanna (2000) observe that, although significant, experience contributed only a limited proportion to inter-firm collaboration. The more relationships an organization has, the more it should know about how to manage them and it may be less costly to form new relationships. On the other hand, experience may lower learning curve so that formation of new relationships may be relaxed. In this study, the previous experience of an organization is represented as the number of organizations it has previously partnered with.

Hypothesis (H14): Previous expience will moderate the relationship between social capital and inter-organizational collaboration.

f) Culture

Cultural factors are also important in shaping the communal social capital which can affect the development of IOEs over time (Morgan and Cooke 1998, Peredo and Chrisman 2006). Vilana and Monroy (2010) argue that the similarities of firm culture also influenced the performance of inter-firm collaboration. For example, collaborative networks can be created from a regional grouping of companies if they already have a longstanding relationship and a cultural history (Camarinha-Matos and Afsarmanesh 1999). Vilana and Monroy (2010) further argue that cultural similarity is also influenced by the external business environments (e.g. the stability of financial market or political environment). When deciding to collaborate, firms should assess their anticipated ease of working with the other partner; possible language difficulties, cultural differences, style incompatibilities, differences in values and norms, and the presence of a strong 'mentor' who will help the collaboration (Contractor and Lorange 1988). However, culture similarity has significant negative influences on the collaboration success rate in both Australia and China (Zhang 2014). In other words, the more different the cultural backgrounds of the collaborating firms, the more successful is likely to be the inter-firm collaboration.

Cultural differences between countries affect the negotiation process and outcomes of inter-firm collaborations (Jia and Rutherford 2010, Vilana and Monroy 2010). Nationality mediate the relationship between particular resource benefits and the performance of IOR (Koka and Prescott 2002). The national cultures have a significant impact on work behaviour (Hofstede, Neuijen et al. 1990). Different cultures may have very different views on communication, trust, and business profits (Kuada 2002). Kuada showed that partners in different nations had limited knowledge about each other's culture, which affected the trust level during collaborations but had limited influence on the overall performance of the inter-firm collaboration. A firm's culture may have an effect on partner selection in inter-organizational collaborations. In mandated collaborations, partnership development is likely to be complicated as the

threats and opportunities might be perceived differently by organizations with different backgrounds.(Perkmann, Tartari et al. 2013).

The framework proposed by Ronen and Shenkar (1985) included four dimensions of cultural difference: culture, language, religion, and technology similarities, which was based on comprehensive cultural literature. In the banking domain, the cultural differences of the local organizations and the foreign organizations may be reflected through factors such as values and beliefs, religious bias, use of language and ratios of staff ethnic composition. Therefore, organizations may consider these aspects when choosing partners. Forming ties with local organizations may open door ways for foreign organizations to quickly adopt to local culture and local organizations may prefer forming ties with foreign organizations to tap in to larger sources of funds. On the other hand, organizations may prefer ties with culturally similar partners to enable smooth interactions. In this research, firm culture was operationalized using a dummy variable, coded 1 for local organizations and 0 for foreign organizations.

Hypothesis (H14): Culture will moderate the relationship between social capital and inter-organizational collaboration.

g) Organization Structure

Some organization's informal networks are very similar to, and thus obviously constrained by, the organization's hierarchy. Others are more fluid and seem to place less constraints on whether employees follow the chain of command to obtain information. Some studies have addressed the impact of organization structures on innovative performance (Chacar and Lieberman 2003, Dunning 2015). Through a study of Biopharmaceutical Industry, Zhang et. Al (2007) provides evidence that firm’s knowledge breadth and the centrality of its R&D organization structure positively influence its absorptive capacity, and consequently, its propensity to form strategic alliances.

As such, it is interesting diagnostically to see the extent to which hierarchy conditions information flow and knowledge exchange in a given organization. In this research, organization structure was operationalized using a dummy variable, coded 1

for organizations that are part of a larger parent organization (such as a group) and 0 for organizations that stand alone.

Hypothesis (H15): Organization structure will moderate the relationship between social capital and inter-organizational collaboration.

h) Gender Ratio of Director Board

Gender networks and practices constitute an important source of skills and characters (Clegg and McNulty 2002). The existing literature on gender differences in managerial decision making is somewhat inconclusive. Geddes (2000) found that the majority of women work on the ground level of partnerships, with limited membership of partnership management groups. Some studies report no significant gender differences in managerial decision making (Powell 1990) while others conclude that women place greater emphasis on non-financial and personal goals and more likely than men to see their contributions to the quality of the decision-making cycle as their competitive edge (Carter, Williams et al. 1997). It was found that female directors improve board effectiveness in risk management with respect to R&D investment (Chen, Ni et al. 2015). Power, politics, conflict management and trust act as intervening variables which attenuate the direct relationships between gender and organizational decision making processes (Klenke 2003).

The gender differences in the ways of exercising power, employing political savvy, managing conflicts and utilizing trust in strategic decisions, differently affect organizational decision making (Brass 1985). Ibarra (1992) suggests that if men have more power in an organization, men's networks will contain more powerful people, while women's networks will include less powerful people (i.e., women), limiting their social capital. Previous studies of collaboration have shown that, even though women scientists generally collaborate just as men, they have significantly fewer numbers of different collaborators (Cole and Zuckerman 1984) partly due to constraining social dynamics. Exploring the role of gender of key people in inter-organizational partnerships therefore is considered to add value to the contributions of this study. In

this study, the gender ratio is represented as the ratio of female directors over male directors (number of females / number of males) in the firm.

Hypothesis (H16): Gender ratio of director board will moderate the relationship between social capital and inter-organizational collaboration.

In summary, the main model presented in the figure 3.1 is further extended to hypothesize that ICT capability and a range of other firm-level factors may moderate the effect of Social Capital towards inter-organizational collaboration. This extended model is presented in the figure 3.3.

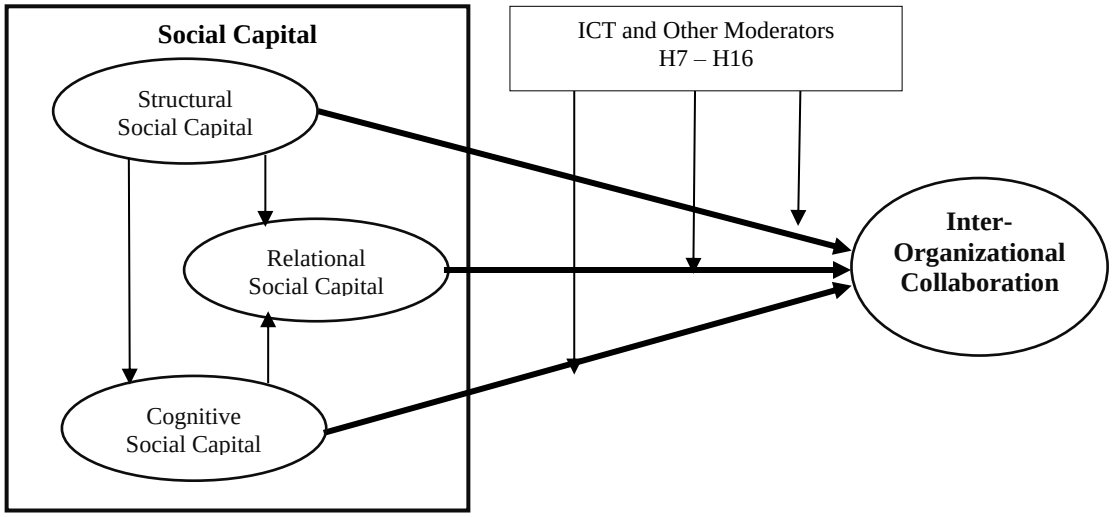

Figure 3.3 : The Model of SC-based IOC Including Moderating Effects

3.3.4 Model Extensions (Value Creations)

3.3.4.1 Social Capital and Performance

Firm performance is defined as "*the economic outcomes resulting from the interplay among an organization's attributes, actions and environment*" (Combs, Russell Crook et al. 2005: 261). The firm performance can be related to the broader construct of organizational effectiveness. Organizational effectiveness is defined as "the degree to which organizations are attaining all the purposes they are supposed to" (Strasser, Eveland et al. 1981 : 323). Venkatraman and Ramanujam (1986) identified multiple indicators of organizational performance as financial performance, operational performance and overall effectiveness. Financial performance includes overall profitability (indicated by ratios such as return on investment, return on sales, return on assets, and return on equity), profit margin, earnings per share, stock price and sales growth. Operational performance refers to non-financial dimensions, and focuses on operational success factors that might lead to financial performance including both product-market outcomes (including market share, efficiency, new product introduction and innovation, and product or service quality) and internal process outcomes (productivity, employee retention and satisfaction, and cycle time).

Researchers have established a positive link between managerial social capital, and organizational performance, especially through the ability to obtain organizational resources and capabilities (Uzzi 1996, Pennings, Lee et al. 1998, Uzzi 1999, Peng and Luo 2000, Rowley, Behrens et al. 2000, Lee, Lee et al. 2001). Using survey data from China, Peng and Luo's (2000) demonstrate that managers' micro interpersonal ties with top executives at other organizations and with government officials help improve macro organizational performance. The relationships between managers and their customers and suppliers facilitate the creation, acquisition, and exploitation of knowledge (Dyer and Nobeoka 2000). While the networking relationships with customers may create both customer and brand loyalties, and increase sales (Park and Luo 2001), those with suppliers will provide access to quality raw materials, superior service, and fast and reliable deliveries (Peng and Luo 2000). The ties with competitors may lead to the sharing of information about how to reduce operations cost (Von

Hippel 1987), or collaborate to share resources, and implicitly collude to deal with competitive uncertainties in their environment (Park and Luo 2001). The findings from a study in Ghana suggest that social capital developed from managerial networking with top managers at other firms, government officials (political leaders and bureaucratic officials), and community leadership enhance organizational performance through enable secure access to information, resources, and knowledge (Acquaah 2007). According to Acquaah, the networking relationships a manager forges with external parties at the micro level in Africa can provide an organization with several benefits. Firstly, by enabling secure access to financial and strategic resources. Secondly, by exposing organizations to high-quality information about products, marketing, and technological opportunities. Thirdly, by creating opportunities for knowledge acquisition and exploitation (Dyer and Singh 1998). The impact of social capital on firm performance differs between firms that pursue the different competitive strategies (low-cost, differentiation, and combination) (Acquaah 2007).

Adler and Kwon (2002) highlight information as being the first direct benefit of social capital. They argued that social capital facilitates access to broader sources of information and improves information's quality, relevance and timeliness. These conditions allow individuals to enhance their knowledge through everyday interactions with colleagues. Burt (1993) suggests that this information benefit could be in the form of access to valuable information (a) in an efficient manner, (b) from external contacts sooner than without those contacts, and (c) on available opportunities through referrals and reputational endorsements.

It was also established that social capital mediates the influence of human capital on firm performance of insurance organizations and commercial banks in Kenya (Ogutu, Obonyo et al. 2015). Moreover, Cabello-Medina, Lopez-Cabrales and Valle-Cabrera (2011) argue that high levels of social capital can enhance the skills and capabilities of individuals (human capital). Baldwin *et al.* (1997) have indicated that an individual who is central in the social network is, over time, able to accumulate knowledge about task-related problems and workable solutions and serves as a valued resource for future exchanges. Similarly, Reed et al. (2006) state that the inimitable value of human capital can be enhanced by social relations. Their argument is that, a network of rich, social

connections can reduce the amount of time and investment required to gather information and can serve as a valuable conduit for knowledge diffusion and transfer.

In summary, the social capital may promote increased performance in organizations through enable access to information, resources, knowledge and opportunities thereby increasing firm's capabilities to exploit knowledge, reduce operations cost, provide superior service. Accordingly, the following hypothesis and the extended model is developed.

Hypothesis (H17): Organizational social capital will be positively associated with the performance.

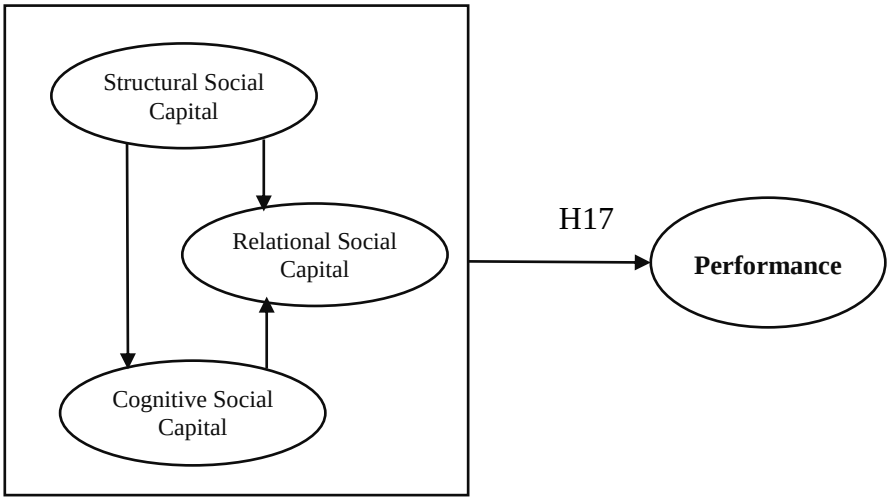

Figure 3.4 : Model of Social Capital based Performance

3.3.4.2 IOC and Performance

Inter-organizational collaboration (IOC) and networking are seen as a cause of increased firm performance and competitiveness. However, explaining the connections between inter-organizational collaboration and performance is complex. (Singh and Mitchell 2005, Lavie 2006). Powell, Koput, and Smith-Doerr (1996) found that the locus of innovation in the biotechnology industry was the network, not the individual firm. In collaborative networks, organizations are structured primarily to make a favourable position against the competition. Organizations that are unable to position themselves in the learning networks are at a competitive disadvantage. Von

Hippel (1987) makes a similar argument in respect of networks of manufacturers, suppliers, and users.

Network position has consistently emerged as an important influence on firm performance (Podolny and Stuart 1995, Ahuja 2000). Koka and Prescott (2002) suggest that in strategic alliances in the global steel industry, information volume and information diversity are significantly and positively related to firm performance. In a strong line of research on IOR beginning with the New York City apparel industry, Uzzi (Uzzi 1996, Uzzi 1997, Uzzi and Spiro 2005) has shown that embedded ties can produce competitive advantages in comparison to arm's-length ties. These ties set expectations for trust and reciprocity facilitating pooled resources and cooperation. As a result, embeddedness increases the economic effectiveness of firms along a number of dimensions that are crucial to competitiveness in a global economy; organizational learning, risk-sharing, and speed to market (Stuart, Hoang et al. 1999).

Several studies have explained the importance of inter-organizational interaction for the creation and diffusion of innovations (e.g. Ibarra 1993, Ghoshal, Korine et al. 1994, Powell, Koput et al. 1996). Moran and Ghoshal (1996) argued that new sources of value are generated especially through new ways of exchanging and combining resources. To create new products, organizations need to reallocate resources, combine new resources, or combine existing resources in new ways. Several scholars have claimed that innovation requires diverse resource inputs (e.g., Kanter, 1988) and combinative capacities (Kogut and Zander 1992). The processes of resource exchange and combination is associated with innovation (Tsai and Ghoshal 1998). As Hitt, Hoskisson, Johnson, and Moesel noted, "Firm innovation has become important for value creation" (1996 : 1085).

Overall, when organizations engage in long term collaborations with other organizations, it brings a range of benefits to individual organizations such as information, new knowledge, access to resources, establishment of corporate social identity, trust and reputation, that lead to competitive advantage, new innovations and increased performance. Accordingly, the following hypothesis and the extended model is developed.

Hypothesis (H18): The extent of collaboration an organization engages with other organizations will be positively associated with its performance.

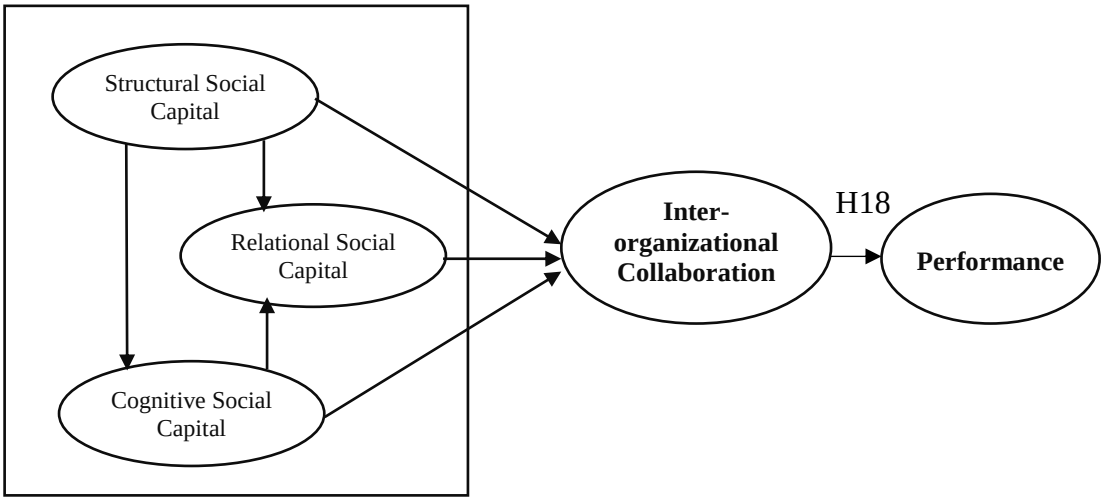

Figure 3.5 : Model of Social Capital, IOC and Performance

3.3.4.3 Social Capital, CSR and Performance

Corporate Social Responsibility (CSR) has become an integral, although controversial, part of modern business practice (Economist 2005). The most common operationalization of CSR is found in the work of Carroll (1991) who provides the foundational concepts of CSR. The firm's CSR practices should encompass its economical, legal, ethical and voluntary activities for social responsibility, whereas more and more emphasis is only on the voluntary practices that may include philanthropy, corporate volunteerism and corporate citizenship (Putnam 1993). According to Goddard (2005), CSR activity that benefits the community can generate positive attitudes in the business, and therefore can be a critical component in economic prosperity and sustainable development. On the basis of previous literature, the research divides CSR into two dimensions: external CSR practices and internal CSR practices (Saeed and Arshad 2012). Researchers have also documented an internal dimension of CSR that generally covers the employees' well-being at work, particularly including their health and safety and also development and talent identification (Fuentes-García, Núñez-Tabales et al. 2008). This study will focus on external dimension of CSR which is concerned with the external environment of the business.

In theory, CSR and Social Capital are closely related (Sacconi 2004, Sacconi and Degli Antoni 2008, Degli Antoni and Sacconi 2011). The multi-dimensional concept of social capital draws on research about the capacity for cooperation in societies. Putnam argued that social capital is accumulated in actual human relationships and therefore relates to interactions within and between groups that lead to the establishment of social norms and networks which, in turn, facilitate cooperation and collective action (Putnam 1993, Putnam 1995). Adler and Kwon's (2002 : 23) define social capital as 'the goodwill available to individuals or groups. Its source lies in the structure and content of the actors' relations. Its effects flow from the information, influence and solidarity it makes available to the actor.' Adler and Kwon (2002) identified 'opportunity', 'motivation' and 'ability' as the sources of social capital which reside in social structure. They argue that actors' social interactions create opportunities to act together and for social capital transaction. Motivation has to do with why 'donors' help 'recipients' in the absence of immediate returns. Ability refers to the competencies and resources at the nodes of the social structure. These three sources of social capital can be useful in explaining its contribution towards CSR. In 2008, Sacconi and Antoni identified that "Even though SC and CSR seem to be linked by many common elements related to the quality and quantity of social relations between agents, their relationship has not been deeply investigated yet." (p. 2). Their theoretical analysis further identified how and under what conditions a virtuous circle between cognitive social capital, CSR, and structural social capital would operate. In particular, organizations who wish to benefit from CSR must treat both strong and weak stake holders fairly in order to continue to benefit from social capital beliefs and reputation that continue to support cooperation between the firm and its stakeholders. Empirical research also show other, similar links. Muthuri at el. (2009) identify that 'employee volunteering' positively contribute to the overall CSR agenda of UK based organizations. It is also evident that organizations operating in high social capital regions have higher levels of CSR (Jha and Cox 2015).

There is also evidence of two-way relationship between social capital and CSR. Saeed and Arshad (2012) view CSR as a resource-generating activity by creating support networks, relationships and management of perceptions in the form of social

and reputational capital that ultimately leads to profitability. Researchers have found CSR to create reliable social networks for organizations and social capacity (Goddard 2005). According to Barney, (1991) organizations can capitalize on their unique resources for sustainability.

However, the exact relationship between social capital and CSR is still not clearly understood, especially the aspects such direction of causality and the how the specific dimensions of social capital affect it. On the other hand, it is pertinent to understand what drives organizations to be more socially responsible in developing contexts where CSR of organizations could have a higher impact on society. Thus, it is useful to understand how and why social capital contributes to CSR by distinguishing its structural (networks), relational (trust) and cognitive (shared vision, knowledge, understandings and norms). While this thesis mainly argues that the firm-level social capital will positively affect degree of social responsibility of the firm, the possibility of feedback loop from CSR in creating social capital elements such as 'trust' is also acknowledged. Accordingly, the following hypothesis can be generated;

Hypothesis (H19): Social capital will be positively associated with extent of CSR disclosure of an organization.

a) Linking Structural Social Capital and CSR

Networks are interactions, formal and informal, that connect groups of people. An actor's network of social ties creates opportunities for social capital transaction as people act together and lever each other's resources. An individual can belong to multiple networks, each of which has its own dynamics. The quality of direct and indirect ties in a network can affect the creation of social capital (Granovetter 1973). Networks enable diffusion of information, influence and knowledge which motivate and empower other actors in the network. Such flows may give rise to various norms and expectations within the network. Actors have varied levels of mutual obligation or expectation towards others within the network. More frequent and intense social interactions with other organizations in the network may influence an organization to act in certain ways such as being socially responsible due to the increased situational

awareness, knowledge, social pressure coming from the corporate social network. In informal networks that span across firm boundaries, people can share ideas and opportunities leading to industry-wide development.

The structural (network) dimension of social capital directly feeds into one of the most debated issues in CSR, namely the creation, maintenance and management of meaningful stakeholder relations (Andriof, Waddock et al. 2005, Muthuri, Matten et al. 2009). Increasingly, this has proven to be one of the biggest challenges for the corporation and this dimension of social capital directly provides an important platform for stakeholder engagement as part of CSR. External social ties offer opportunities for new forms of stakeholder engagement.

In sum, the structural social capital in terms of social interactions ties act as an information system that bring along diverse information on economic, environmental, and social trends and expectations while producing influence to act upon the needs.

Hypothesis (H20): The structural social capital of an organization will be positively associated with the extent of CSR disclosure of an organization.

b) Linking Relational Social Capital and CSR

Trust is described as the 'fabric' (Caldwell and Clapham 2003) or the 'bond' of society (Melé 2003). Barber (1983: 164–165) defines trust as 'socially learned and socially confirmed expectations that people have of each other, of organizations and institutions in which they live, and of the natural and moral social orders that set the fundamental understandings for their lives'. The act of trusting is based on actors' experiences in a transaction, their perceptions of the 'other' and the associated expectation that the other will reciprocate.

Both the stakeholder approach of CSR (Freeman and Evan 1990) and at the contractarian approach of CSR (Sacconi 2004, Sacconi 2006, Sacconi 2007) consider the relational aspects, are essential in order to implement the CSR practices. In 2008, Sacconi and Antoni (2008) theorised that "relational aspects, in terms of trust,

trustworthiness and spirit of cooperation, may have a key role in promoting the coordination processes between firm and stakeholders that are essential in order to implement the CSR practices." (pp. 1-2). They further identified a gap in that "Even though SC and CSR seem to be linked by many common elements related to the quality and quantity of social relations between agents, their relationship has not been deeply investigated yet." (p. 2). González-Rodríguez et al (2015) revealed that the perceptions of customers influence the CSR perceptions and actions of entrepreneurs, who seek to be congruent with the expectations of customers. As such, the more an organization is aware of how much the other organizations and stakeholders perceive them as 'trustworthy', may reinforce them to engage in further behaviour such as CSR.

Organizations frequently justify their CSR in general, with reference to their reputation for trustworthiness. Trust is a key parameter in CSR as corporations see this as a way of demonstrating that they are legitimate and trusted members of society, particularly following recent scandals in the USA and Europe (e.g. Lorsch, Berlowitz et al. 2005, Matten and Crane 2005, Moon, Crane et al. 2005). Many of the companies most active in CSR are active in order to rebuild trust in the products and production processes of the company, as illustrated by recent UK fast-food industry and supermarket initiatives.

The relational social capital may have a two-way relationship with CSR. Trustworthy members can provide social and emotional backing, resulting in stronger emotional attachment and satisfaction. Therefore, relational capital of an organization may incline the firm further to act affectively towards the society and environment as a whole such as CSR activities. On the other hand, the CSR could feed into the increased reputation of organizations creating a feedback loop. However, we could assume a positive association between the two.

Hypothesis (H21): The relational social capital of an organization will be positively associated with extent of CSR disclosure of an organization.

c) Linking Cognitive Social Capital and CSR

Shared norms between the company and its stakeholders have been identified as vital for CSR. Carroll's widely used definitions of CSR (1991) conceptualize 'ethical responsibilities' as a key element of CSR implying that the company is expected not only to comply with the law but also with the broader values and norms of society. Norms of cooperation define what actions are considered acceptable or unacceptable according to shared understandings, informal rules and conventions that make reciprocal exchanges meaningful (Commission 2003). Many corporations built up their CSR activities just because they were confronted by a wide gap between their practices on the one hand and ethical norms and expectations of their stakeholders on the other (Tokoro 2007). The present research views that the cognitive social capital can be one successful avenue that enable organizations to know more about stakeholders' ethical expectations and for reaching shared understandings of the values which should govern its business practices. Studying the CSR in relation to the triple bottom line concept (financial, social, environmental) González-Rodríguez et al (2015) found that human values influence the perceptions of CSR, and that the CSR perceptions of customers influence the CSR perceptions and actions of entrepreneurs, who seek to be congruent with the expectations of customers.

Following the literature on SC that stresses its multi-dimensional character (Paldam 2000), Sacconi and Antoni (2008) argue that there may be a virtuous circle between Cognitive Social Capital, CSR, and Structural Social Capital (in terms of IORs). According to them, the cognitive SC plays a key role in inducing the firm to adopt and observe CSR practices that respect all the stakeholders and the decision of adopting formal instruments of CSR also contributes to create cognitive SC. On the other hand, Antoni and Sacconi (2011) revealed that four factors lead to sustainable CSR and maximal structural social capital: "(a) reciprocal beliefs that others will cooperate, (b) a generic disposition to cooperate, (c) conformist motivations contingent on agreed norms and beliefs, and (d) the existence of sanctions against agents that decide not to cooperate." (p. 225).

In sum, the shared goals, norms, understandings and knowledge of organizations may predispose them to be more aware of stake holders' (including other organizations and industry as a whole) expectations and other environmental conditions and enable them to recognize the importance of sustainable development and behave in ways that are more socially conscious and responsible.

Hypothesis (H22): The cognitive social capital of an organization will be positively associated with extent of CSR disclosure of an organization.

d) CSR and Firm Performance

CSR is widely used by business organizations as a way of demonstrating that they are legitimate and trusted members of society (e.g. Lorsch, Berlowitz et al. 2005, Matten and Crane 2005, Moon, Crane et al. 2005). The principle of 'triple bottom line' proposed by the Sustainability Institute in the UK is that business management should be evaluated using economic, environmental, and social indices, and this has become the basis for current CSR management.

Mainstream of studies that investigated CSR and firm performance reveal positive relationship between the two constructs. Many researchers have identified the benefits of CSR which are ultimately resulted better financial performance. Prior research posit that the awareness of CSR initiatives enables people to view the organizations as more socially responsible (Brown and Dacin 1997, Bhattacharya and Sen 2003, Klein and Dawar 2004). Research by Turban and Greening (1997) and Greening and Turban (2000) drew on both social identity theory and signalling theory to implicate CSR as a significant driver of a company's attractiveness to potential employees. Moreover, the CSR activities results in improved employee and customer goodwill (Ruf, Muralidhar et al. 2001). A growing body of evidence, points to the pivotal role of a company's CSR actions, in revealing its identity (Sen and Bhattacharya 2001, Lichtenstein, Drumwright et al. 2004, Maignan and Ferrell 2004). Simoes and Dibb (2008) also identify that CSR activities of organizations increase corporate identity, image and reputation. According to Goddard (2005) corporate activities can generate positive attitude toward the organizations. Sen (2006) also reveals that CSR awareness

to be positively related to the stakeholders' attitudes toward the company. Sacconi and Antoni (2008) argue that the level of cognitive SC and CSR practices creates long term relationship between the firm and stakeholders (they refer to this as structural capital). In addition, this social cohesion can build profitability in the business. Awareness of a company's CSR is positively associated with a greater intention to invest in the company (Sen, Bhattacharya et al. 2006). It is also evident that banks and other investor organizations consider social responsibility to be a factor in investment decisions (Graves and Waddock 1994). Some of the other beneficial outcomes of CSR at firm-level include reduction of cost of capital (Diamond and Verrecchia 1991, Baiman and Verrecchia 1996) and economic benefits through improved relationship and standing with important stakeholders (Moussavi and Evans 1986) and reduce levels of risk (Clarkson 1995).

On the other hand, avoiding responsibility may provoke additional legislation leading to higher costs of compliance (Russo and Fouts 1997). Only a few scholars argued that high responsibility result in additional costs and put an organization at an economic disadvantage (Bragdon and Marlin 1972, Vance 1975) while some argued that the additional costs of CSR may be set off by its benefits, leaving no positive or negative relationship (Cornell and Shapiro 1987). In the Sri Lankan context, a study that focused on the banking, finance and insurance sector also revealed that there is a significant positive relationship between disclosure of CSR with ROE and ROA indicating higher levels of CSR yields higher levels of financial performance (Wijesinghe and Senaratne 2011).

The literature review also highlights the growing interest of the banking industry for CSR related activities. In a study from Italy shows that although investments in CSR of the banks do not directly contribute to economic benefits for banks, these activities bring a balance in the image created in the financial market (Employment 2001, Costa and Menichini 2013). It is evident that CSR approach contributes to a favourable image in the economic environment (Dahl Rendtorff and Mattsson 2012). Lipunga (2013), presents research results on the same direction through a study is conducted on commercial banks in Malawi. Yeshmin (2012) show that 36.67% of the in private commercial banks disclose their CSR related activities in annual reports. A study in

Bangladesh reveals that 100% of banks reported the implications on CSR practices (Masud, Kaium et al. 2012). A study conducted in Nigeria also reveals that CSR practices in banks are included in reports, as important elements in developing a favourable image (Akinpelu, Ogunbi et al. 2013). The study shows that most banks engage in social activities and less on the environment. According to Lenka and Jiri in 2014, the implications of banks in CSR activities are important because the financial crisis has highlighted the need to integrate these concepts into the banking industry.

Based on the above discussion, it is possible to derive an overall consensus that CSR yields better financial performance in organizations through increased reputation, increased attractiveness, increased goodwill, reduction of costs and risks, improved identity with stakeholders.

Hypothesis (H23): The extent of CSR disclosure of organizations will be positively associated with organizational performance.

Another version of the model is developed to investigate an alternative outcome of social capital at the firm-level, the CSR disclosures. The model hypothesizes that social capital will be associated with the CSR disclosure of organizations' and the degree of CSR disclosure of organizations will be positively affect the firm performance. The extended model is given in the figure 3.6.

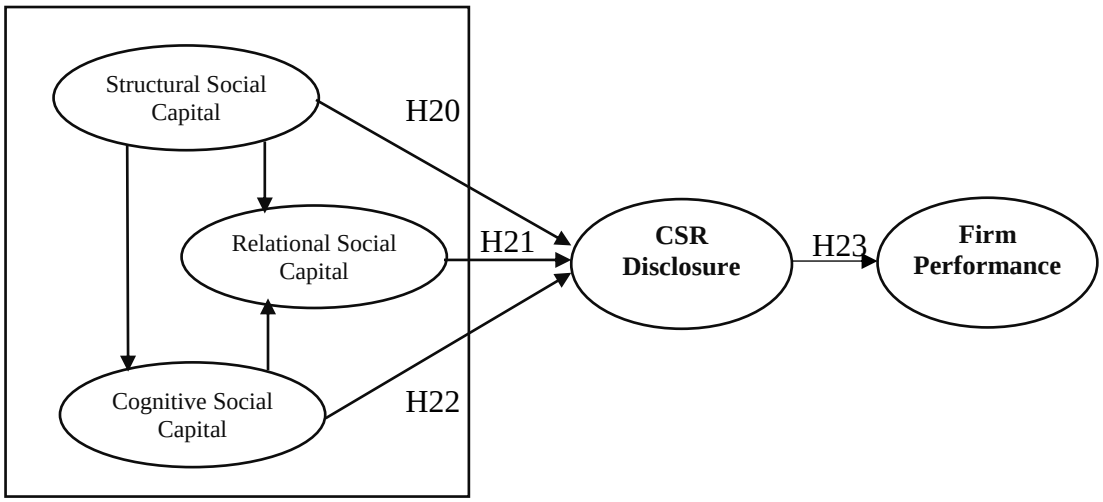

Figure 3.6 : Model of Social Capital, CSR and Performance

3.4 Operationalization of Constructs

3.4.1 Unit and Level of Analysis

Social capital can be conceptualized and operationally defined at many different levels of analysis, including individuals (e.g. Belliveau, O'Reilly et al. 1996), organizations (e.g. Burt, Nohria et al. 1992), inter-organizational arrangements (e.g. Baker 1990), and societies (Putnam 1995). For the purpose of this study, which is focused on the relationships among banking organizations in the Sri Lankan banking sector, social capital is analysed at the level of organizations. Accordingly, all the hypotheses on (1) how the three dimensions of social capital interact among themselves, and (2) how they influence alliances among the different organizations, are formulated the level of organizations.

3.4.2 Indicators of Theoretical Constructs

The theoretical constructs in the conceptual model needs to be defined before the model can be empirically validated. The literature-based model presented in this thesis is empirically validated through the application of a certain methodology which is implemented through a series of phases, namely, problem definition, literature review, development of a conceptual model, development of a survey instrument, data collection, conducting data analysis, and drawing conclusions and proposing recommendations. The identification of indicators of theoretical constructs through literature also contribute to the content validity of measurement instrument.

The definitions of the theoretical constructs used in this study were previously discussed in detail in the the Chapter 2. The theoretical constructs are summarized in the table 3.5.

Table 3.5 : Definitions Adopted in this Study

Construct	Definition used in this research	Reference
Social capital	The sum of actual and potential resources embedded within, available through, and derived from the external social network possessed by organizations	Nahapiet and Ghoshal (1998 : 243); Tsai and Ghoshal (1998)
Structural dimension	Extent of inter-organizational social interactions of a firm *(Various structural properties are explored in the analysis)*	Tsai and Ghoshal (1998); Lazega and Pattison (1999); Luo & Gben, (1997); Peng, (1997, 2000); Tabbaa and Ankrah (2016)
Relational dimension	Extent of Trustworthiness of a firm	Tsai and Ghoshal (1998); Tabbaa and Ankrah 2016
Cognitive dimension	Extent of Shared Understandings of a firm	Tsai and Ghoshal (1998); Bstieler at el (2015); Tabbaa and Ankrah (2016)
Inter-organizational Collaboration	Formal, long term, voluntary corporative arrangement between two or more organizations aimed to achieve shared goals and mutual benefits.	Zhang (2014); Todeva and Knoke (2007); Wong and Ellis (2002)

3.4.2.1 Indicators of Social Capital Dimensions.

Structural Dimension: For the Structural Dimension, inter-organizational social interactions were operationalized using multiple indicators in this study. They include both the firm-level and top managers' connections. Previous scholars have considered managerial ties as indicators of social capital at the firm-level (Acquaah 2007). The following items were used as indicators of inter-organizational social links;

- Participation in different inter-organizational social events
- Frequency of inter-organizational social interactions
- Top managers' external social affiliations (industry and professional)

These indicators of '**structural social capital**' were identified from literature as summarized in the table 3.6.

Table 3.6 : Indicators of Structural Dimension (Social Interactions)

High Level Definition	Indicators	Related Literature
Degree of firm-level Social Interactions	Participation in social events	• Edwards (2004) - (Australian Social Capital Framework and Indicators) • The UK Social Capital Measurement Framework (2003)
	Frequency of Social Interactions	• Tsai and Ghoshal (1998) (*Time spent in social occasions)* • Akhavan and Hosseini Mahdi (2015) *(Social interaction ties)* • Tabbaa and Ankrah (2016) *(Social interaction ties)*
	Directors' external social connections	• Kim (2007) *(External affiliations of directors)* • Dakhli and Clercq (2004) *(Frequency of attending professional activities)* • Bouty (2000); Ferlieet al. (2005) *(Professional Ties)* • Dubini & Aldrich, (1991) *(Ties with executives at other organizations)* • Geletkanycz and Hambrick (1997) (*Managerial ties*) • Peng & Luo (2000) *(Managerial ties with other organizations' managers)* • Luo, Y. (2003). *(Managerial ties)* • Acquaah, (2007) *(Managerial ties with top managers at other organizations)*

Relational Dimension: A set of indicators reflecting 'trust' between organizations were identified. These items were based on similar questions used by previous researchers (Zucker 1986, Young-Ybarra and Wiersema 1999, Gassenheimer and Manolis 2001, Norman 2002). The following items were used as indicators of inter-organizational trust;

- Perceived expectation of non-opportunistic behaviour
- Perceived institutional competence / reputation
- Perceived reliability based on previous promise keeping

Table 3.7 summarizes the literature-based indicators of '**relational social capital**' in the firm-level.

Table 3.7 : Indicators of Relational Dimension (Trust)

High Level Definition	**Indicators**	**Related Literature**
Trust, Trustworthiness	Non-Opportunistic Behaviour	• Dyer and Chu (2000) - (Firm-level) • Zaheer et al. (1998) - (Firm-level) • Tsai and Ghoshal (1998) - (Unit level) • Chow and Holden (1997) - (Salesperson level)
	Promise Keeping	• Gassenheimer and Manolis (2001) (Salesperson level) • Zaheer et al. (1998) - (Firm-level) • Tsai and Ghoshal (1998) - (Unit level) • Doney and Cannon (1997) - (Firm-level) • Chow and Holden (1997) - (Firm-level) • Ganesan (1994) - (Salesperson level)
	Institutional Reputation	• Plank et al. (1999) - *(Firm-level)* • Mo¨llering (2002) - *(Firm-level)* • Inglehart (2000) - World Values Survey (WVS) - *(Institutional trust)*

Cognitive Dimension:

For the Cognitive Dimension, the following aspects were used as indicators of 'shred understandings' (shared cognition) between organizations. The following items were used as indicators of inter-organizational shared understandings;

- Shared work understandings
- Shared institutional vision
- Shared market knowledge

The following table 3.8 summarizes the literature-based indicators for the 'cognitive social capital' in the firm-level.

Table 3.8 : Indicators of Cognitive Dimension (Shared Understandings)

High Level Definition	Indicators	Related Literature
Shared Understandings	Shared Vision	• Tsai and Ghoshal (1998) *(Unit level, Managers' perception)* • Tsai and Ghoshal (1998) *(Industry level, Managers' perception)* • Garcia-Morales and Llorens-Montes' (2006) *(CEO's perception)* • Pearce and Ensley (2004) *(Team member perception)*
	Shared Work Understandings (Norms)	• Grootaert and Van Bastelaer (2002) World Bank's Social Capital Assessment Tool (SOCAT) *(Adherence to norms)* • Tabbaa and Ankrah (2016) *(Common understandings)*
	Shared Market Knowledge	This is an industry specific indicator

These items are mapped to survey questions, guided by the previous literature with similar items. The development of survey items related to is described in the Chapter 5. From the collected data, relevant locational properties are generated. This procedure is described in Chapter 6 (Preliminary Data Analysis). The study further explores the predictability of alternative locational measures (e.g. betweenness, effective network size) representative of different aspects of structural dimension (e.g. brokerage, cohesion). The relevant network measures used for each construct in the model are discussed in the Chapter 3.3.3.

3.4.2.2 Indicators of Inter-Organizational Collaboration

Collaboration has a variety of definitions and names but is generally treated as meaning the cooperative way that two or more entities work together toward a shared goal. Both counts and centrality measures can be used to measure collaboration. This study was based in the context of inter-bank domain.

To measure formal inter-bank collaboration, the degree of involvement in syndication alliances of banking organizations were measured using a few indicators;

- Number of alliances
- Number of distinct alliance partners
- Number of alliance leaderships
- Centrality of an organization in the inter-organizational alliance network

The following table 3.9 summarizes the literature-based indicators used to measure the degree of **strategic collaborations** of the organizations.

Table 3.9 : Indicators of Inter-Organizational Alliances

High Level Definition	**Indicators**	**Related Literature**
Degree of engagement in Strategic Alliances	Using counts to measure collaboration	• Wright and Lockett (2003) : number of partners • Chung at el (2000) : number of alliance • Salter et al. (2009): number of projects and partners • Lee (2016): number of joint R&D • Shan, Walker, and Kogut (1994): number of collaborative relationships • Ahuja (2000): number of partners
	Using Centrality to measure different types of collaboration in a given network	• Tsai and Ghoshal (1998) : in resource exchanges • Collaborative networks: Macke (2010) • Powel et al. (1996): in R&D collaborations • Swaminathan & Moorman (2009): in alliances • Newman (2001): in scientific collaborations • Zhao (2012): in inter-organizational collaboration

The data for this construct was collected through the survey and by directly requesting each bank to provide a list of syndications they participated in during the last three years. Th procedure used here is given in the Preliminary Data Analysis (Chapter 5).

3.4.2.3 Indicators of ICT Capability

ICT capability level was measured using a measure similar to the organizational ICT level indicators presented in the literature (Chae, Yen et al. 2005, Bayo-Moriones and Lera-López 2007, Indicators 2010). Given the amount of variety of technologies and the banking-industry-specific nature of ICT, a list of the most representative technologies used in the banking domain in the Sri Lankan context is developed as given the table 3.10.

Table 3.10 : Firm-level ICT Capabilities of Banking Organizations

Shared Banking Systems	**ICT based Banking Services**
SLIPS – Sri Lanka Interbank Payment Systems	Online banking
RTGS – Real-time Gross Settlement System	ATM cards
Online Dollar Clearing System	Credit cards
Common ATM Switch	Telephone banking
CEFT – Real-time fund transfer system	SMS banking
Lankasettle system	Mobile banking
LankaSecure system	Point of sale swipers
CRIB – Interface to credit information bureau	Fully automated centres
SWIFT - Society for Worldwide Interbank Financial Telecommunication	Salary slips system
Internal Banking Systems	**General Organizational Systems**
Core banking system	Knowledge management system
Treasury management system	Management information system
Internal auditing system	Web site
Internal CRIB system	ERP – Enterprise software
Electronic trading platform	
ICT Infrastructure	**Communication Technologies**
ATM network	Telephone
Payment Gateway	Email
ICT HR	Social media
Internal IT services team	Internet
Internal software development team	Video conferencing

Table 3.11 summarizes the literature-based indicators used to measure the ICT capabilities of the banking organizations.

Table 3.11 : Indicators of ICT Capability

Construct	Indicators	Related Literature
ICT capability	Number of ICTs	Rheingold (2001); Srivastrva (2005); Selwyn, (2004); Chae at el. (2005); Honig et al., (2000)

3.4.2.4 Indicators of Performance

In the context of the banks, financial performance is the process of measuring the results of an organization policies and operations in terms of monetary value. Evaluating the financial performance of a business allows decision-makers to judge the results of business strategies and activities in objective monetary terms. When evaluating a bank's performance, several conventional analyses may be done on the basis of the information in its financial statements, such as profitability and risk analysis, and the efficiency of asset management (Athanasoglou, Delis et al. 2006). Bank profitability is typically measured by the Return on Assets (ROA) and/or the Return on Equity (ROE), and Net Interest Margin (NIM) (Athanasoglou, Delis et al. 2006). In a comparative Analysis of Financial Performance of Commercial Banks in Tanzania, Zawadi Ally (2013) measured bank profitability by three indicators; ROA, ROE and NIM. In a case of the Commercial Bank of Eritrea and Housing and Commerce Bank of Eritrea, Fitsum Ghebregiorgis, Asmerom Atewebrhan (2016) summarized ROA, ROE, NIM, debt-equity, and expense-income ratio as the most commonly used profit-ability, risk and efficiency measures. Abdus at. el. (2006) evaluated the inter-temporal performance of commercial banks using the performance measures; ROA, ROE, loan loss reserve ratio, and loans past due 30-89 days as a percentage of total loans.

In this study, the performance of banking organizations is measured using ROA, NIM and ROE averaged over the previous three years. The relative approach to measuring performance was chosen to increase the probability of obtaining accurate information on performance and a single global measure of firm performance is used to capture the multi-dimensionality of the performance construct and also for parsimony (Bae and Lawler 2000).

Net Interest Margin (NIM): NIM is a measure of the difference between the interest income generated by banks and the amount of interest paid out to their lenders (for example, deposits), relative to the amount of their (interest earning) assets. The NIM variable is defined as the net interest income divided by total earnings assets (Gul, Irshad et al. 2011). It is similar to the gross margin (or gross profit margin) of non-financial companies. As NIM measures the gap between the interest income on loans and cost of its borrowed funds, it reflects the cost of bank intermediation services and the efficiency of the bank. A negative value denotes that the firm did not make optimal decisions, because interest expenses were greater than the amount of returns generated by investments. Thus, it is one of the key measures of bank profitability and is considered an appropriate measure of performance in banking organizations. However, a higher net interest margin could reflect riskier lending practices associated with substantial loan loss provisions (Khrawish 2011).

Return on Asset (ROA): ROA is an indicator of how profitable a company is relative to its total assets. ROA is calculated by dividing a company's net income for the year annual earnings by its total assets, usually the average value over the year and ROA is displayed as a percentage. This ratio measures the ability of the bank management to generate income by utilizing company assets at their disposal. In other words, it shows how efficiently the resources of the company are used to generate the income (Khrawish 2011). Wen (2010), state that a higher ROA shows that the company is more efficient in using its resources. Previous work has already used and validated this performance measure to be more accurate (Justin Tan and Litsschert 1994, Luo 1995, Luo and Chen 1997, Peng and Luo 2000, Phan, Lee et al. 2003).

Return on Equity (ROE): ROE is another measure of profitability, usually considered in conjunction with ROA, is ROE. Return on Equity (ROE) is a financial ratio that refers to how much profit a company earned compared to the total amount of shareholder equity. A higher ROE reflects the banks management's ability to generate profits from using the owners' equity. Thus, the higher the ROE the better the company is in terms of profit generation. Return on Equity (ROE) is an internal performance measure of shareholder value, and it is by far the most popular measure of performance due to many reasons. Firstly, it is a direct assessment of the financial return of a

shareholder's investment. Secondly, it is only relying upon public information. Thirdly, it allows for comparison between different companies or different sectors of the economy. Banks that rely heavily on deposits and borrowings to support assets tend to have higher ROEs than those that depend on shareholder's funding. In fact, an unusually high ROE versus ROA, can indicate that the bank's equity base is too small and its ability to borrow further is limited.

Table 3.12 summarizes the literature-based indicators used to measure the performance of the banking organizations.

Table 3.12 : Indicators of Firm Performance

Construct	Indicators	Related Literature
Performance	ROA	Luo (1995); Luo and Chen (1997); Tan and Litschert (1994); Wijesinghe and Senaratne (2011)
	NIM	Bitner and Goddard, (1992), p. 185.
	ROE	Zawadi Ally (2013); Fitsum Ghebregiorgis, Asmerom Atewebrhan (2016); Abdus at. el. (2006)

3.4.2.5 Indicators of Corporate Social Responsibility (CSR)

In the modern business context, an organization is not only an economic entity but also a social and political entity as well. The modern concept of CSR states that the business should pay attention to the social interests of the people in the community during the decision-making process.

In the current study, the impact of social capital on CSR disclosure of organizations is also investigated in addition to the main model. In the context of the banks, the CSR is no more a voluntary activity as the reporting on CSR is inevitable. Most countries are now adhering to the GRI guidelines, sustainability reporting, green accounting etc. In the current study, the CSR disclosure of an organization is quantified using two indicators: The Amount of money spent on CSR projects and the Number of different types of CSR projects carried out by the organizations. A range of key areas of CSR activities have been identified (for e.g. health-care, education, knowledge sharing, empowerment of women, environment protection, disaster relief, community

infrastructure, youth empowerment, disabled and elderly care etc.) and the measurements were based on the annual reports which were self-reported disclosures by the respective organizations. The firm-level CSR has been used to quantified using the self-reported CSR disclosures of organizations in other studies (Wijesinghe and Senaratne 2011, Akinpelu, Ogunbi et al. 2013).

Table 3.13 : Indicators of CSR Level

Construct	Literature	Indicators used in this Study
CSR Disclosure	Wijesinghe and Senaratne (2011), Akinpelu, Ogunbi et al. (2013)	Amount spent on CSR (per annum average)
		Number of CSR project categories

3.4.2.6 Indicators of Other Moderators

As a part of this study, a set of external factors that may strengthen or weaken the observed model are also investigated. A set of moderator variables have been identified as described in the section 3.2.3.2 above. Following is a summary of operationalisation of those moderator variables.

Table 3.14 : Indicators of Other Moderators

Moderator Variable	Operationalized as	References
Firm Size	Total Assets, Number of employees	Park and Ungson (1997); Hagedoorn and Duysters (2002); Singh and Mitchell (2005); Zhang (2014)
Firm Ownership	Two groups: State, Non-state	Park and Luo (2001)
Location of Firm Head Office in SL	Two groups: Colombo, Other	Moulaert and Sekia, (2003); McCann and Van Oort, (2009); Vissers & Dankbaar (2016); Park, Li, and Tse, 1997
Firm age	Number of years since establishment	Park and Luo (2001); Park et al., (1997) Park et al. (2010)
Previous experience	Number of banks with previous links	Saxton (1997); Dyer and Singh (1998); Kay 1999; Anand and Khanna (2000); Hagedoorn et al. (2003)
Firm Culture	Two groups: Foreign, Local	Zhang (2014); Kuada (2002)

Organization Structure (Flatness)	Two groups: Standalone organizations, belong to a Group	Chacar and Lieberman, (2003); Dunning, 1994; Pearce and Singh, 1992; Taggart, 1993; Zhang et. al (2007).
Gender Ratio of Director Board	Number of females over males in director board	Chen et al (2015); Klenke (2003); Clegg & McNulty, (2002); Carter et al (1997)

3.4.3 Use of Network Measures

This study focus on the 'external and individual' social capital of organizations in the inter-bank domain to explain '*why and how some organizations do better in inter-organizational alliances*?'. In addition to using the identified indicators, network science concepts are used in this study to operationalize certain concepts more accurately in relation to the structural, relational and cognitive dimension of social capital. Social network analysts have developed a number of tools for conceptualizing and indexing the variations in the kinds of structural aspects. The social capital is defined as the advantage created by a person's location in a structure of relationships (Burt 2004, Burt 2005). The different network locational properties commonly used to represent various aspects of social capital in previous research have been discussed in the Chapter 2. The following section present details of the network measures used in this study to conceptualize each dimension of social capital with the justifications from the literature.

3.4.3.1 Relational Dimension

The relational dimension is conceptualized as the 'trustworthiness' of an organization as perceived by the other organizations in the network. The in-degree centrality for each firm is calculated as a derived indicator of 'trustworthiness' of an organization as it counted the number of nominations each firm received in the inter-organizational trusting relations matrix. In directed networks, the sum of all direct incoming-links for a given node is the in-degree centrality of that node. Incoming links are the connections that the node of interest receives from other nodes in the network (Wasserman 1994). Similar applications of in-degree centrality is evident in other social capital research (Tsai and Ghoshal 1998). In this research, in-degree is used to investigate: '*Do the organizations being nominated by other organizations as trustworthy do better in formal partnerships with other organizations?*'

3.4.3.2 Cognitive Dimension

In this study, the cognitive dimension of social capital was operationalized as the extent of 'shared understandings' of an organization indicted by shared vision, share work understandings and shared market knowledge. The closeness centrality measure

is used in this study as a derived measure of overall proximity to other organizations in terms of 'shared understandings' with other organizations. The closeness represents the idea of proximity to all others in the network (Porta, Crucitti et al. 2006, Wang, Antipova et al. 2011). Accordingly, the calculation of this measure includes averaging the length of the shortest paths to all other actors in the network. In other words, it is the degree an individual is near to all other individuals in a network (directly or indirectly).

The idea of 'closeness' and 'proximity' are closely related. In the domain of IORs, the 'cognitive proximity' indicates the extent to which two organizations share the same knowledge base (Boschma 2005). Cognitive proximity enable organizations to identify, interpret and exploit new knowledge (Cohen and Levinthal 1990, Nooteboom 2000). It means that organizations sharing the same knowledge base can learn more easily from each other than if cognitive distance is large. Nooteboom et al. (2007), demonstrated that cognitive proximity is indeed an important determinant in R&D alliances. It is evident that some organizations act as hubs, while others are poorly connected because they lack the capabilities to understand and exploit external knowledge (Giuliani and Bell 2005, Boschma and Ter Wal 2007, Morrison 2008). In this study, the closeness centrality is used to measure the degree of 'shared understandings' of an organization in terms of 'cognitive proximity' to all others. Although, there is no evidence in the literature for the use of closeness centrality as a measure of cognitive dimension, it can be reasonably applied to answer the question: '*Do organizations that are closer to other organizations in terms of vision, norms and knowledge (with better cognitive proximity) do better in inter-organizational partnerships?*'.

3.4.3.3 Structural Dimension

In this study, the structural dimension is conceptualized as the degree of inter-organizational social interactions that an organization engages in. Focusing on the firm-level structural social capital derived through external social ties with other firms, is it looking to answer the question '*what is the impact of social network ties on formal inter-organizational collaboration?*'. Moreover, alternative locational properties are

explored to identify '*which network positions in the inter-organizational social network are most influential in inter-organizational alliance formation**?***'. This is done through using alternative blocks of indicators representing the structural dimension. Using alternative blocks of indicators for the same construct and choosing the most appropriate items is a common approach followed in exploratory research (Lawshe 1975, Urbach and Ahlemann 2010). In this study, several structural issues are explored in relation to the structural dimension. Structural issues that are examined in this study are; Centrality and Structural holes.

Node Centrality

Centrality measures are the most frequently used measures of network structure. The definition of centrality was first developed by Bavelas (1948, 1950) during the laboratory experiments on communication networks. Since then, the concept of centrality has been applied extensively, though there are a number of different ways of measuring it (Freeman 1978, Freeman, Roeder et al. 1979). This measure gives a rough indication of the social power of a node based on how well a node "connect" with the network. In general, *centrality* measures identify the most prominent actors, that are extensively involved in relationships with other members (**Freeman** 1979). Some very different concepts and interpretations of the centrality resulted in from different objectives (Borgatti and Everett 2006 : 467). Degree, betweenness, eigenvector and closeness are all measure of an actor's prominence in a network (Wasserman and Faust 1994). While there may be considerable conceptual overlap between these constructs, they also may be conceptually distinct. For example, Closeness measures are based on the ideas of efficiency and independence as a result of being situated close to others in the network (Friedkin 1991). Betweenness centrality measures the extent to which an actor lies between pairs of other actors giving the potential to influence others in a network (Friedkin 1991). Eigenvector centrality is based on the intuition that a node's importance in a network is determined by how important its neighbours are. Degree centrality simply measures the number of direct links a node has and is considered the easiest to explain to non-network savvy audiences.

Differences of centrality measures: Previous scholars have been interested in studying the differences in alternative centrality measures. When comparing the degree centrality, betweenness centrality, and closeness centrality for all possible graphs with five actors, Freeman (1979) identifies that the order of the different actors varies hugely with the use of different centrality measures. Freeman also evaluates the suitability of the three centrality measures to identify key persons in the context of "problem solving in groups". More recent contributions deal with the capability of different centrality measures for other applications (e.g. Borgatti and Everett 2006, Hossain, Chung et al. 2007, Kiss and Bichler 2008, Gloor, Krauss et al. 2009, Lee, Cotte et al. 2010). For example, Kiss and Bichler (2008) investigate the performance of different centrality measures in terms of news dissemination in a telecommunications network. They also apply newer centrality concepts (such as PageRank-based centrality measures, the edge-weighted DC, a HITS-based centrality measures and a SenderRank centrality measures).

Borgatti (2005) provided a conceptional discussion of various centrality measures (Degree, Closeness, Betweenness, Eigenvector) regarding their matching for different types of network flows. The author concludes that the traditional closeness centrality measure is suited best for the identification of key individuals for the purpose of diffusing something through the network, while betweenness is preferable for fragmenting the network by removing nodes. Borgatti et al. (2006) further provided empirical evidence of the robustness of different centrality measures under conditions of imperfect data. Closeness, betweenness and straightness have been identified as pertinent when measuring the distance to other nodes in terms of being close to all others, being the intermediary between others, and being accessible via a straight route to all others (Porta, Crucitti et al. 2006). The closeness in street centrality was identified to be the best predictor of land use intensity in Louisiana compared to the betweenness and straightness (Wang, Antipova et al. 2011). Mutschke (2008) identified six anomalies when applying the centrality measures degree centrality, betweenness centrality, and closeness centrality. Costenbader and Valente (2003) empirically analysed the stability of various centrality measures when networks are sampled. Gneiser et al. (2012) identified requirements for a centrality measure for online social networks. Hossain et al. (2007) evaluate data from the mobile sector as

regards the four centrality measures degree, closeness, betweenness, and eigenvector in order to assess the relationship between the centrality of an actor and his possibilities for disseminating information. They find that only by combining different centrality measures the most important actors for the dissemination of information can be identified. Lee et al. (2010) analyse the suitability of the different centrality measures as an indicator for the influence of individual customers on the behaviour of the entire customer base. The results show that betweenanes centrality is positively related to opinion leadership in both cases.

Correlations of centrality measures: On the other hand, previous studies have examined correlations among centrality measures. For example, Bolland (1988) found that the overall degree, closeness, and continuing flow centrality were strongly intercorrelated, while betweenness remained relatively uncorrelated with the other three measures. In a network study of HIV risk behaviors, Rothenberg and colleagues (1995) examined relationships among eight centrality measures: three forms of information centrality, three distance measures, and degree and betweenness centrality. Their analyses showed these eight centrality measures to be highly correlated with a few notable distinctions. Particularly, degree and betweenness, were highly correlated, although less so with information measures which were also highly correlated. In another study, Valente and Forman(1998) found that measures of integration were most highly and positively correlated with in-degree centrality, positively correlated with closeness, betweenness, and flow, and negatively correlated with density. In a study of relationships between CEOs, Faust (1997) found correlations ranging from .89 to .99 among centrality measures including degree, closeness, betweenness, the centrality of an event, and flow betweenness for the identification of central clubs. Valente et.al. (2008) empirically investigate the correlation among four centrality measures, most commonly used by network analysts: degree, betweenness, closeness, and eigenvector. They found that the amount of correlation between degree, betweenness, closeness, and eigenvector indicates that these measures are distinct, yet conceptually related. The highest correlation was between eigenvector centrality and degree (average r=0.92), perhaps because both measures are symmetrized and rely on direct connections.

Comparing the results of previous research which analyses the centrality of individual actors in the application of various centrality measures as discussed above, it remains to be noted that different centrality measures in some cases lead to considerably different results in terms of the centrality of individual actors. Therefore, this study intends to explore the suitability of several relevant centrality measures representing the structural dimension of social capital in the inter-organizational social network. The different centrality measures used in this study are;

Betweenness centrality: Betweenness is a measure of the number of times a node occurs on a path. Betweenness measures the extent to which an actor lies between other actors on their geodesics (paths). The Betweenness Centrality of node v in a network is defined as: across all node pairs that have a shortest path containing v, the percentage that pass through v (Freeman, Roeder et al. 1979). Actors high on betweenness centrality, therefore, have the potential to influence others near them in a network (Friedkin 1991), through both direct and indirect paths. A node with high betweenness centrality can potentially influence the spread of information through the network, by facilitating, hindering, or even altering the communication between others (Freeman, Roeder et al. 1979, Newman 2003). It is a type of centrality measure which indicates the extent that an individual is a broker of indirect connections among all others in a network. An actor who is high in "betweenness" is able to act as a gatekeeper controlling the flow of resources between other nodes in the network. It also indicates the extent to which an entity acts as an intermediary, liaisons or Go-between. In the context of this study, organizations that are potentially influential are positioned to broker connections between groups will have high betweenness scores.

This measure has been used as a measure of brokerage capacity in previous studies, typically to maximize efficient knowledge transfer, co-ordinate effort or to ensure the inclusion of people on the periphery (Hawe and Ghali 2008, Balkundi, Barsness et al. 2009, Creswick and Westbrook 2010, Di Marco, Taylor et al. 2010). In this study, betweenness centrality answers the question '*Does an organization serving as a gatekeeper within the inter-organizational social interactions do better in formal partnerships with other organizations?*'.

Eigenvector centrality: Eigenvector Centrality reflects one's connections to well-connected others. This measure considers actors to be central in the network if their direct contacts are in relationship with many other well-connected actors. Those high on eigenvector centrality are linked to well-connected actors and so may influence many others in the network either directly or indirectly through their connections. Therefore, it is a measure of the importance or degree of influence of a node in a network. Those with higher scores of eigenvectors could be critical when rapid communication is needed. In general, the individual most connected to others in a clique and other cliques, is the leader of the clique. As such, an organization high in eigenvector centrality in the inter-organizational social network could be viewed as a social leader. In this study, eigenvector centrality answers the question '*Does an organization having social connections with other well connected organizations in the social network, do better in formal partnerships with other organizations?*'

Closeness centrality: Closeness centrality indicates 'proximity' to all others in the network (Freeman, Roeder et al. 1979, Porta, Crucitti et al. 2006, Wang, Antipova et al. 2011). Accordingly, the calculation of this measure includes the length of the shortest paths to all other actors in the network. It reflects the ability to disseminate information on the network quickly and effectively and access information through the rumors of network members. If an actor is close to all others in the network, then he is less dependent on others to reach everyone in the network. Therefore, closeness measures are based on the ideas of efficiency and independence (Friedkin 1991). As a result of being situated close to others in the network, actors high on closeness measures are able to efficiently transmit information and have independence in the sense that they do not need to seek information from other more peripheral actors. In the context of this study, the closeness centrality answers the question '*Do organizations with short social "paths" to all other organizations in the network do better in formal partnerships (alliances) with other organizations*?'

Degree centrality: The degree centrality is the sum of all direct contacts of a member (node). It signifies activity or popularity. Degree is often a highly effective measure of the influence or importance of a node: in many social settings people with more connections tend to have more power. The social capital of a node refers to the network position of the object or node and consists of the ability to draw on the resources

contained by members of the network (Lin 1999). Organizations high in degree are likely to receive and spread critical information that flows through the organization hence can be influential in the network. In the context of this study, degree centrality answers the question '*Does the centrality of an organization in its social network (central or peripheral) has any effect on its formal partnerships with other organizations?*'

Structural Holes

A structural hole manifests between two actors who themselves are not connected (Burt 2005). Early theory on brokerage roles was developed in Burt's "**Structural holes"**, and his book *Brokerage and Closure*, in the context of social network theory. According to Burt, Brokers are said to reach across a structural hole. He shows that when a node is connected with other nodes that are not connected with one another, it is at an advantaged position, providing an important form of social capital. This approach is very useful in understanding power, influence, and dependency effects. The structural holes in a network can be measured by considering both the ego networks and whole network. Imagine a network of three actors (A, B, and C), in which A is connected to B and C as in figure 3.8. There is a structural hole between B and C (B and C cannot exchange). If A wanted to exchange with another actor, he has two alternative exchange partners whereas B and C have only one choice, if they must enter into an exchange.

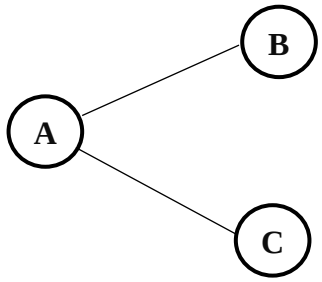

Figure 3.7 : Three Actor Network with a Structural Hole

According to Burt, those that span structural holes often occupy positions of considerable influence. The benefits of brokerage are mainly based on the assumption that non-redundant actors are sources of unique information which provides social capital. In general, brokers facilitate transactions between entities separated by a

structural hole. Burt's approach to understanding the way that an actor is embedded in its neighbourhood is very useful in understanding power, influence, and dependency effects.

In IOR domain, organizations in broker positions are viewed as at an advantage. Brokers are considered key players in a network (Borgatti and Everett 2006). Organizations with superior network structure, such as those with structural holes, are better positioned to have privileged access to important external resources (Venkatraman and Lee 2004). In a study of inter-organizational collaborations within the international chemicals industry, Ahuja, G. (2000) identified that brokering structural holes between organizations increases innovative output. While the benefits of brokerage roles involve access to novel information, co-ordinate effort across the network, innovation, knowledge brokerage, trust brokerage, increase cooperation by liaising, and improve efficiency by introducing "good ideas" and controlled transfer of specialised knowledge between groups, brokers who become the gatekeepers to specialised knowledge may act as barriers (Long, Cunningham et al. 2013). In this study, an organization with more structural holes in its social network, may have access to unique information, may have more opportunities to broker connections between others and therefore be better alliance leaders.

A range of brokerage parameters have been used in literature as valid empirical means of identifying brokers. In a review of literature on brokerage roles during 1994 to 2011, Long, Cunningham and Braithwaite (2009) show that the level of analysis and the ways in which brokers were identified varied greatly across studies. Bridges, brokers and boundary spanners are commonly used terms for the 'broker' function in the literature. Hanneman and Riddle (2005)also examined the brokerage roles played by a given actor, and identified possible instances of a "broker" as coordinator, consultant, gatekeeper, representative and liaison. Since the structural holes and brokerage roles go hand in hand, the parameters used to identify them in the literature are somewhat overlapping. While betweenness is commonly used for both brokerage and structural holes (Balkundi, Barsness et al. 2009, Creswick and Westbrook 2010, Di Marco, Taylor et al. 2010), effective network size (Heng, McGeorge et al. 2005, Susskind, Odom-Reed et al. 2011) and network constraint (Burt 2004, Obstfeld 2005, Zaheer

and Soda 2009, Aral and Van Alstyne 2011) have been specifically used as measures of structural holes. In this study, the 'effective network size' measure has been used to measure the degree of structural holes in the ego's social network.

Effective Network Size: Effective network size is a commonly used measure of structural holes in a network. Effective size of the network is the number of contacts that a node has, minus the average number of links that each contact has to other contacts. Suppose that A has ties to three other actors. Suppose that none of these three has ties to any of the others. The effective size of ego's network is three. Alternatively, suppose that A has ties to three others, and that all of the others are tied to one another. A's network size is three, but the ties are "redundant" because A can reach all three neighbours by reaching any one of them. The average degree of the others in this case is 2 (each alter is tied to two other alters). So, the effective size of the network is its actual size (3), reduced by its redundancy (2), to yield an efficient size of 1. In this study, the 'effective network size' helps to answer the question *'Does the extent of spanning structural holes, has any effect on its formal partnerships with other organizations?'* Organizations that span "structural holes" (Burt 2004) are considered to be brokers, often occupying positions of considerable influence. It was estimated based the collected data using SmartPLS software tool.

Summary of Network Measures

This study is focused at the social capital at the inter-organizational level. The network measures used to represent each construct in the model are summarized in the table 3.15.

Table 3.15 : Summary of Network Measures for Constructs in the Model

Construct	Network Measure	References for similar use
Structural social capital	Total degree centrality	(Burt, 1983); Tsai and Ghoshal 1998
	Closeness centrality	(Freeman 1979); Borgatti and Everett (1998)
	Eigenvector centrality	(Bonacich 1972); Borgatti and Everett (1998)
	Betweenness centrality	(Freeman 1979); Tsai and Ghoshal 1998; Balkundi, and Barsness et al. (2009); Creswick, N. and Westbrook (2010); Di Marco, and Taylor et al. (2010); Hanson et al. (2008); Hawe, and Ghali (2008); Heng et al. (2005)
	Effective Size	Burt (1992); Borgatti and Everett (1998) Cummings, J. & Cross, R. (2003); Susskind, A., P. Odom-Reed, et al. (2011); Heng et al. (2005)
Relational social capital	In degree centrality	Tsai and Ghoshal 1998
Cognitive social capital	Closeness centrality	-
Collaboration	Total degree	Zhao, at el (2012)

3.5 Summary

This Chapter harnessed a specific set of literature to form a sound basis for the noval theory proposed in this study. A literature based model was carefully developed and the theoretical constructs and the relationship between them were identified based on the literature. For each construct, observable measurement indicators were identified based on the previous literature. Being an exploratory study, certain theoretical constructs were also operationalized using alternative measurement models to achieve a better understanding of more suitable measurement models. The next Chapter will present the research methodology employed in this study and the relevant justifications.

Chapter 4

RESEARCH METHODOLOGY

4.1 Introduction

A systematic approach of solving a research problem is referred to as a research methodology (Garg and Kothari 2014). It describes the sequence of steps leading to meet the research aims (Hall and Howard 2008, Creswell, Klassen et al. 2011). The research methodology usually incorporates methods, tools and techniques applicable in each phase of the research, with justification on which methods are most suitable for the research study in focus (Kumar and Phrommathed 2005).

The choice of methodology generally depends on the nature of the research to be undertaken (Srivastava and Thomson 2009). In general, there are two complementary approaches, namely exploratory research and confirmatory (Boudreau, Gefen et al. 2001). Kimmelman at el (2014) suggest that while the exploratory approach is typically aimed at generating new theories, the confirmatory approach is utilized when the aim is at validating strong effects in existing models. Taking an **exploratory** style facilitate generating detailed insights on a social phenomenon by analysing how individuals respond to the phenomenon (Jaeger and Halliday 1998). To do so, an exploratory researcher may examine a data-set from which posteriori hypotheses are generate. An exploratory approach can also be taken even when there is prior knowledge availed regarding an association between variables, if there is a lack of knowledge of the direction and strength of the relation. As such, if the researcher does not have any specific prior hypotheses, the study is exploratory with respect to the such variables (although it might be confirmatory for others). Exploratory approach is easier to follow when building new theories due to the less-strict methodological restrictions.

A research project of the **confirmatory** nature, requires defining hypotheses on a topic of interest before collecting and analysing data, which will allow its acceptance or

rejection (Jaeger and Halliday 1998). The priori hypotheses are usually derived from a theory or the results of previous studies. The advantage of confirmatory research is that the result is more meaningful, in the sense that it is much harder to claim that a certain result is statistically significant.

This research explores '*how an organization can better collaborate with other organizations by harnessing the value associated with their informal, external social network*?' As such, the basic research question addressed in this study is: '*To what extent, multiple dimensions of social capital could be used to predict the formation and success of strategic, collaborative relationships between organizations?*' This study involves building a new theory, partially based on and extending from existing theory of social capital developed by Nehapiet and Ghoshal (1998). Although this study primarily takes positivist view point based on strong theoretical arguments, some of the components such as moderation effect of ICT capability, the mediation of CSR disclosure and the use of different network measurements as indicators of constructs are treated as exploratory aspects in this study. Accordingly, this study employs PLS-SEM technique as a suitable soft modelling approach to quantitatively validate the new model using the data collected from a survey in inter-bank domain. Choice of this technique is justified in more detail in the section 4.3 in this chapter.

This chapter details the research methodology adopted in this study. The chapter explains the succession of stages through which research progress to meet its objective. In particular, the development of the survey instrument, its deployment for data collection and the data analysis approaches are explained in this chapter with an explanation of different methods and techniques used at each phase. The chapter is organized as follows. First, the chapter describes the selection of the research approach suitable for this study. This section presents a general discussion of well-known research paradigms in information systems research and a justification on the choice of paradigm for this research. The next section details the implementation of the chosen research methodology in this study. This includes a step by step description of stages in methodology including formulation of theory, review of literature, development of conceptual model, development of survey instrument, data collection, analysis of data and the steps taken to ensure reliability and validity. The section 4.7

provides a description of Structured Equation Modelling including related validity criteria providing a basis for the analysis techniques used in this study. The section 4.8 provides the details of steps taken to address the ethical concerns in this research. Finally, the section 4.9 conclude the chapter by providing a summary of the methodological aspects discussed in the chapter.

4.2 Research Paradigm

This section outlines ontology, epistemology, and methodology necessary to understanding the research project. Epistemology refers to how we made the judgements on what is true. Epistemology is concerned with "*what is truly knowledge*" and "*what is the relationship between what is known and who knows it*" (Orlikowski and Baroudi 1991, Punch 1998). With regard to Information Systems research, it is pertinent to understand the epistemological viewpoint of a study in order to understand how the researcher came to her conclusions. Based on the epistemological assumptions, researchers support key research designs. Guba and Lincoln (1994) suggest four underlying paradigms: positivism, post-positivism, critical theory, and constructivism. Orlikowski and Baroudi (1991), suggest three categories, based on the underlying research epistemology: positivist, interpretive and critical. From an overall viewpoint, when looking at how researchers have taken standpoints on a spectrum between positivist and interpretive viewpoints, indicate that positivism dominates IS research (Braa and Vidgen 1999, Goles and Hirschheim 2000). The only alternative paradigm observable in considerable numbers in IS research is interpretivism (Nandhakumar and Jones 1997, Trauth and Jessup 2000).

There are several key differences between positivism and interpretivism. Positivists believe that reality exists objectively and independently from human experiences while interpretivists emphasize the subjective meaning of the reality that is constructed through a social interaction process (i.e. Ontology) (Burrell and Morgan 1979). Epistemologically, positivists are concerned with the deductive testability of theories. Once a causal relationship is presented, a tight coupling among explanation, prediction and control is expected (Orlikowski and Baroudi 1991). Interpretivists assume that scientific knowledge should be obtained through the understanding of social

interaction by which the subjective meaning of the reality is constructed (Walsham 1995). Methodologically, positivists believe that, to test theory, research should employ objective measurement to collect research evidence through a quantitative method such as the survey. Interpretivists, argue that to understand the meaning embedded in social interaction, researchers need to engage in the particular social setting and learn how the interaction takes place from the participants' perspective. Field studies that engage researchers in the real social setting would be more appropriate for generating interpretive knowledge (Orlikowski and Baroudi 1991).

4.2.1 The Positivist Paradigm

The positivist researcher is an observer who does not interfere in the situation (Braa and Vidgen 1999). A positivist creates new knowledge only when it can be verified through measurement and observation (Domholt 2005). Such a research usually starts with a predetermined relationship which is then investigated using structured instruments such as surveys or laboratory experiments (Orlikowski and Baroudi 1991). To be valid, the results must be replicable and applied universally. Positivist research typically use quantitative measurement and statistical analysis where information is expressed as numbers and can be quantified (Punch 1998). The methods commonly used by positivist researchers include: confirmatory analysis, nomothetic experiments, quantitative analysis, laboratory experiments and deduction (Olsen 2004).

4.2.2 The Interpretive Paradigm

Interpretive researcher takes one situation at a time in attempt to understand a phenomenon. Rather than discovering a universal truth, interpretivists try to better understand a unique, complex human process in a particular situation that can then be used to inform other situations (Orlikowski and Baroudi 1991, Baskerville and Wood-Harper 1996) Walsham (1995) argues that interpretive methods of research in IS are not only aimed at producing an understanding of the context, but also the process whereby the information system influences and is influenced by the context. The interpretive researcher is interested in understanding the reasons behind people's actions. Such a researcher typically uses qualitative methods in a search for

explanations towards an understanding of social and organizational contexts through empirical information that is not in numerical form (Punch 1998). The methodologies used by interpretivist scholars consist of: field experiments, exploratory analysis, idiographic experiments induction and qualitative analysis (Ogilvy, 2006; Tugendhat, 2006). This information is usually in the form of words such as interview transcripts, recordings, or observational records. In the Interpretive Paradigm does not pre-define dependent and independent variables, but focuses on the full complexity of the situation (Kaplan and Maxwell 1994). Researchers assume that access to reality is only through social constructions such as language, consciousness and shared meanings. They generally attempt to understand phenomena through the meanings that people assign to them (Klein and Myers 1999).

4.2.3 The Critical Paradigm

Critical researcher focuses on the disagreements, conflicts and contradictions in the society, and attempts to be liberate. It aims to aid removal of the causes of unwarranted alienation and domination and thereby enhance the opportunities towards realising human potential (Klein and Myers 1999). Critical researchers believe that social reality is historically constituted and that it is produced by people. However, social, cultural and political domination restrain critical researchers from recognising the ability of people to consciously change their social and economic circumstances. The critical research view is not appropriate to this research as it does not allow for criticism of social, cultural and political domain.

4.2.4 Hybrid Approach

The study of information systems is not only concerned with the development of computer systems. IS research is concerned with technology, psychology, economics and the integration of technology and organizations. The implementation of a new technology involves technology, people, society, and an environment that is constantly changing. It is comparable to other management and organizational research containing the same complex, real-world challenges (Galliers 1993, Mingers 2001).

Positivist research has long been the dominant style in the Information Systems research (Orlikowski and Baroudi 1991) and practitioners are finding 'traditional' IS research to be irrelevant (Coghlan 2004) as positivist research does not necessarily provide solutions that can be applied to practice (Galliers 1993). A number of IS researchers have expressed concern with the lack of interpretive and mixed method research in information systems (Evered and Louis 1981, Stone 1990, Orlikowski and Baroudi 1991, Coghlan 2004).

Researchers are trying to address this issue by using a combination of interpretive and positive methodologies in order to better understand and explain complex phenomenon (Braa and Vidgen 1999, Trauth and Jessup 2000). Mingers (2001) reviewed six journals between 1993 and 1998 and found that out of the articles that contained empirical research, 80% used surveys, interviews, experiments, or case studies and 13% used more than one research method. Mingers (2001 : 245) posits that, "*research is a process with different types of activities which will predominate at different times. Particular research methods are more useful for some functions than others, so a combination of approaches may be necessary to provide a more comprehensive research outcome*." The advantages of multi-method research include the ability to gain a wider comprehension of the situation by approaching from different perspectives, to validate findings by combining different methods, and to stimulate innovation.

In summary, both approaches offer benefits that do not necessarily have to be mutually exclusive (Trauth and Jessup 2000). As Evered and Louis (1981 : 392) write, "*One is methodologically precise, but often irrelevant to the reality of organizations; the other is crucially relevant but often too vague to be communicated to or believed by others.*" By understanding the implications of each approach, it is possible to deploy the approach most appropriate for the researcher, the research question, and the method.

4.3 Research Strategy

The choice of strategy is generally based on the choice of research paradigm. Positivist research typically use quantitative measurement and statistical analysis

(Punch 1998). Interpretive a researcher typically uses qualitative methods in a search for explanations towards developing an understanding of contexts through empirical information that is not in numerical form. Quantitative and qualitative research designs differ in terms of their epistemological, theoretical and methodological underpinnings.

4.3.1 Qualitative Strategy

The qualitative strategy is generally adopted in the interpretivist approach for understanding a social phenomenon in detail (Neuman 2007, Creswell 2009). Qualitative researcher collect data such as words and photos by examining documents, observing and interviews (Neuman 2007, Creswell 2009). The collected data is analysed to identify the patterns and to derive interpretations (Neuman 2007, Creswell 2009) leading to the building of a theory (Bryman and Bell 2015). There are numerous benefits associated with qualitative strategy. Qualitative studies can disclose insights of individuals' regarding a phenomenon in detail (Steckler, McLeroy et al. 1992, Myers and Newman 2007). It offers a clear understanding based on how and why different individuals respond to a phenomenon in certain ways (Steckler, McLeroy et al. 1992, Myers and Newman 2007). A qualitative strategy also allows to discover perspectives that were not considered at the beginning (Carr 1994). There are also a few limitations in this approach. While the research outcomes may be affected by the biasness of the researcher in interpreting results (Duffy 1985), the reliability might be affected due to the absence of standardized techniques such as instrumentation (Duffy 1985, Carr 1994, Neuman 2007). In addition, the results of the qualitative research lacks generalizability due to limited sample sizes considered (Steckler, McLeroy et al. 1992).

4.3.2 Quantitative Strategy

A quantitative strategy typically supports positivist approach for confirming theories (Neuman 2007, Bryman and Bell 2015). The researchers develop theories based on existing theories and domain knowledge, and collect using research instruments such as surveys to confirm those theories (Neuman 2007). The data are, then analysed to test the validity of the proposed theories. There are many benefits associated with quantitative strategy. The results of a quantitative research could often

be generalized to a large population (Steckler, McLeroy et al. 1992, Creswell 2009). The research instruments developed in quantitative studies yield better reliability and validity as they are often developed by referring to instruments developed and tested in previous research (Steckler, McLeroy et al. 1992, Neuman 2007). The research instruments developed in qualitative studies are assessed using various statistical tests (Carr 1994). Pilot studies are often used to improve the validity of the instrument. However, a quantitative research strategy does not allows to explain individuals' different perceptions and feelings regarding a phenomenon in detail (Steckler, McLeroy et al. 1992, Neuman 2007).

4.4 Methodological Justifications

4.4.1 Use of Quantitative Approach

This study develops and test a **new theory** which is extending partially from an existing theory in an attempt to answer the question "*why some organizations do better in inter-organizational collaboration?"* through the lens of social capital. Based on the theoretical foundations of social capital on value creation presented by Nehapiet and Ghoshal (1997) and the theoretical groundwork concerning social capital and IOR by Nehapiet (2008) and following the empirical research design unitized by Tsai and Ghoshal (1998), this study builds and tests a new model investigating the effects of the three dimensions of social capital on the firm's degree of collaboration with other organizations.

Although the core of this study takes a **positivist**, **confirmatory** viewpoint based on strong theoretical support, some components and aspects are considered exploratory. The individual constructs in this study are confirmatory in style which use measurement indicators identified from the previous literature. However, certain **exploratory analysis** is carried out as follows. First, different sets of measurement indicators are tested for one theoretical construct in the model (Structural Dimension) in order to explore which structural property in the inter-organizational social relations is the best predictor of inter-organizational collaborations. Secondly, two different sets of measurements are compared in order to identify whether network measures better predict the IORs over regular measures. Third, the study explores interventions unique

to the inter-bank domain such as the different aspects of ICTs that may strengthen or weaken the relationship between social capital. In addition, an extended version of the model is tested with another theoretical construct, 'CSR disclosure' as a mediator between social capital and collaboration. There is a lack of knowledge on the directions of causality of the link between social capital and CSR.

IS research range from strictly positivist to interpretive and constructivist epistemological beliefs (Urbach and Ahlemann 2010). Theory building has traditionally been based on qualitative data, using inductive case studies (Eisenhardt 1989) or grounded theory approaches (Glaser and Strauss 1967, Urquhart, Lehmann et al. 2010). However, Glaser and Strauss (1967) point out that "*there is no fundamental clash between the purposes and capacities of qualitative and quantitative methods or data … each form of data is useful for both verification and generation of theory*." (pg. 17f).

This study uses an exploratory approach using quantitative technique. A **quantitative approach is chosen for this study is due to several reasons**. A quantitative strategy is useful when there are comparable research instruments to measure the constructs in the proposed model. For example, the survey questions used by Tsai and Ghoshal (1998) could be re-used to for measuring dimensions of social capital. Availability of previous measurement instruments may also contribute to improve reliability. A quantitative strategy is also useful for increasing the generalizability of the hypotheses since they are validated based on the perceptions of a larger population (Steckler, McLeroy et al. 1992, Creswell 2009). It also allows to provide results with accuracy and predictability such as in this study.

4.4.2 Use of SEM Technique

This study uses the quantitative technique ofStructured Equation Modelling (SEM). Although structural modelling traditionally follows a positivist epistemological belief, Evermann and Tate (2009) shows that SEM can also provide deeper insights into a phenomenon, allowing us **to build theories based on**

quantitative data. SEM allows complex theoretical models, with many structural relationships among theoretical constructs to be validated using collected data (Hair 2010). SEM also allows modelling unobservable theoretical constructs through latent variables (LVs) and validate the relationships between such constructs with the use of observable indicator variables (Hair 2010, Kline 2010). Such a technique is suitable to validate the conceptual model proposed in this thesis.

SEM techniques can be considered the second generation of multivariate analysis (Fornell and Larcker 1987). In contrast to first-generation techniques, such as factor analysis, discriminant analysis, or multiple regression, SEM allows to simultaneously validate a series of relationships among multiple independent and dependent constructs (Byrne 2010, Hair, Anderson et al. 2010). Thus, SEM allows to answer a set of interrelated research questions in a single, systematic, and comprehensive analysis (Gefen 2000). Such a technique is suitable for validating relationships defined in the pre-conceptualized model in this research.

There are several approaches to SEM. These approaches differ in objectives, underlying assumptions and the nature (Gefen, Straub et al. 2000). As a result, the choice between these two approaches should be carefully made. The most commonly used approach is **Covariance based SEM** (CB-SEM) which could be applied using software such as AMOS (Analysis of Moment Structures). Another SEM approach that is attracting researchers' interest is **Partial Lest Squares SEM** (PLS-SEM) which can be easily applied through software tools such as SmartPLS, PLS Graph and 'r' package.

The **CB-SEM** is a covariance-based approach which compares the given theoretical model to the best possible model fit. It typically uses a maximum likelihood (ML) function to minimize the difference between the sample covariance and those predicted by the theoretical model. Consequently, the CB-SEM requires observed variables to be normally distributed. CB-SEM has been widely applied for **confirming theories** (Hair, Anderson et al. 2010 : 776) particularly when sample size is large, data is normally distributed and when the model is correctly specified (Hair, Ringle et al. 2011, Wong 2013). Although CB-SEM is ideal for testing of a known theory, it often

ends with factor indeterminacy which makes it very unreliable in the exploratory analysis required for theory building (Chin and Todd 1995).

In contrast, **PLS-SEM** is a component-based approach for testing SEM. PLS is designed to explain the variance (Gefen, Straub et al. 2000) and therefore the focus is more on prediction (Hair, Anderson et al. 2010). It doesn't make any assumptions of data distributions (Vinzi at el 2010). Thus, PLS makes lesser demands on measurement scales, sample size, and residual distributions (Wold 1985). PLS is a good alternative to CB-SEM when there are small sample sizes, when there is little available theory, when data distribution is skewed, when it is difficult to ensure correct specification of the model and when the predictive accuracy is a key requirement (Hwang and Tsai 2011, Wong 2013). Since PLS avoids factor indeterminacy, it doesn't deliver inadmissible solutions even in exploratory situations (Fornell and Bookstein 1982). Accordingly, PLS does not require the theory being tested to already have empirical support that is well established from other sources (Gefen, Straub et al. 2000). According to Hair at el (2014), "*If the research is exploratory or an extension of an existing structural theory or If the goal is predicting key target constructs or identifying key 'driver' constructs, use of PLS-SEM is recommended*". While using PLS-SEM for exploratory work is recommended by scholars (Ringle, Sarstedt et al. 2012, Hair and Lukas 2014), it is especially recommended over CB-SEM for **exploratory studies** that include formative constructs (Lowry and Gaskin 2014, Hair, Hult et al. 2016). According to Lowry and Gaskin (2014), "*one should initially consider whether the research is exploratory (building or testing a new theory) or confirmatory (testing a well-established theory). For exploratory work, PLS should be selected. For confirmatory work, either technique may be used"*

There are also **limitations** associated with PLS compared to CB-SEM such as limited ability to handle multicollinearity, inability to model unidirectional relations (Wong 2013). It may result in biased component estimation, loadings and path coefficients due to the lack of consistency of scores on LVs. Despite these limitations, PLS has been increasingly used as an alternative to CB-SEM (Hair, Anderson et al. 2010) and has been applied in research in many fields such as marketing (Henseler, Ringle et al. 2009), management information systems (Chin, Marcolin et al. 2003), business

strategy (Hulland 1999) and behavioural sciences (Bass, Avolio et al. 2003) signifying appreciation of the unique features of PLS (Henseler, Ringle, & Sinkovics, 2009).

A few studies also have systematically evaluated PLS-SEM's performance when the sample size is small (e.g. Hui and Wold 1982, Chin and Newsted 1999). Reinartz et al. (2009) showed that PLS-SEM achieves high levels of statistical power in comparison to CB-SEM, even with relatively small sample sizes (i.e., 100 observations). Both theoretical discussions (Beebe et al. 1998) and simulation studies (Cassel, Hackl et al. 1999) show that PLS-SEM results are robust if data are highly skewed, also when formative measures are used (Ringle et al. 2009). The partial least squares (PLS) algorithm has become increasingly popular both in IS research and in other disciplines such as marketing (Henseler, Ringle et al. 2009, Albers 2010) or strategic management (Hulland 1999).

4.4.2.1 Suitability of PLS-SEM for this Study

In this research, the PLS - SEM technique is used to investigate the role of social capital for strategic collaboration among banking organizations in Sri Lanka. There are number of reasons for choosing the PLS-SEM over CB-SEM is considered beneficial for the current study.

Firstly, this research involves **building a new theory** which also involves development and validation of alternative measurement models with new measurement items. PLS is considered suitable as this work involves building a new theory integrating available literature, rather than testing a well-known theory using pre-existing data collection instrument. PLS is considered suitable for this study as it has been widely recommended for exploratory studies, where some measures are new and the relationships have not been previously tested enough (Tsang 2002, Lee, Yang et al. 2006, Ainuddin, Beamish et al. 2007, Hair, Anderson et al. 2010). Secondly, the new theoretical model developed and tested in this study involves relationships that cannot be specified with accuracy due to lack of prior theory. PLS is chosen for this study as is it recommended for situations where there is a possibility that certain structural relationships might or might not exist (Chin, 1998) and where theory is

insufficiently grounded (Acedo and Jones 2007). In general, the regression-based approaches (PLS) are considered more suitable than the covariance-based approaches (CB SEM) at an early stage of model development (Venaik, Midgley et al. 2005).

Thirdly, this study involves testing a complex model including a number of latent variables (LVs). Moreover, it also involves testing moderating and mediating effects of more variables. PLS is used for this study as it is recommended for complex models focusing on the prediction and for modelling of interaction effects (Chin, Marcolin et al. 2003). Fourthly, PLS is considered suitable for this study as its recommended for models where multi-item measures may not be available for latent constructs (Hair, Anderson et al. 2010). The number of indicators of individual constructs in this model are limited and vary between two to three in the current study. PLS determines the relationship between established indicators and its respective LVs, which is critical for validating the exploratory models (Julien and Ramangalahy 2003, Mahmood, Bagchi et al. 2004).

Fifthly, there are only 34 banking organizations in the Sri Lankan banking domain, which is considered a small sample size that may not be enough for regular statistical tests to achieve high statistical significance. PLS is considered well suited for this study as it works with relatively small sample sizes (Cassel, Hackl et al. 1999) and when there are skewed data distributions (Hwang, Malhotra et al. 2010, Wong 2013). PLS also make no assumptions regarding the distributional form of measured variables (Chin 1998). Finally, PLS-SEM is considered appropriate for this research due to the accessibility of user-friendly tools such as SmartPLS 3.0 (Ringle, Wende et al. 2005) supporting data analysis and validation. For all these reasons, PLS SEM is identified as the best approach to build and test the new theory presented in this research. The section 4.7 presents a detailed description of PLS-SEM process and related assessment criteria.

4.5 Implementation of the Research Method

For the purposes of this research, a quantitative research strategy is adopted using PLS-SEM technique. Urbach and Ahlemann (2010) presented a generic process model for PLS-SEM-based research, pointing out the activities required within each step and the results produced. This process model is summarized in the following figure (Figure 4.1). However, most of the framework's characteristics are applicable to SEM in general, except for the PLS-SEM specific model validation criteria used in model validation stage.

Stage	Activities	Outcomes
Problem Definition & Research Design	Define research question Develop research methodology Specify external validity Specify scope and the level of analysis	Research questions External validity Scope and level of analysis
Theoretical Foundation	Literature review	Basic theories Potential construct definitions Potential measurement models
Model Construction & Instrument Development	Develop structural model Develop measurement models Develop survey instrument Pre- and pilot testing	Complete structural model (alternative) measurement models and indicators Survey instrument
Data Collection	Distribute survey instrument Collect data Quality assessment of data	Raw data
Model Validation	Validate measurement models Validate the structural model Perform Bootstrapping or Jack-knifing (significance testing)	Acceptable values for validity measures, well-grounded discussion of deviations A final version of the model with acceptable model parameters
Interpretation	Analyse and interpret the results	Confirmed or rejected hypotheses Conclusions drawn from the final model Identification of further need for research

Figure 4.1 : Generic Process Model for PLS-SEM Research (Urbach and Ahlemann 2010)

The research methodology implemented in this research adopting the above process model is shown in the figure 4.2.

	Key Phases	Activities	Details
Phase 1	Problem Definition & Research Design	Identify research aims • Define research questions • Develop research methodology • Specify intended external validity • Specify scope and level of analysis	Chapter 2 Chapter 4
Phase 2	Review of Literature	Review of literature on; • Social Capital • Inter-Organizational Relations • Corporate Social Responsibility • ICTs	Chapter 2
Phase 3	Development of the conceptual model	• Develop conceptual model • Developing initial hypotheses • Develop measurement models o Identify indicators from literature o Interviews to augment the literature	Chapter 3
Phase 4	Development of the Survey Instrument	• Develop survey instrument • Consultation of experts from the banking industry for feedback • Conduct pilot study to improve the instrument	Chapter 4
Phase 5	Collection of Data	• Collect data through manual and online survey	Chapter 4
Phase 6	Preliminary Data Analysis	• Quality assessment of collected data o Response rate o Data screening o Tests for common method bias	Chapter 5
Phase 7	Model Validation	• Validate the measurement model • Validate the structural model • Perform Bootstrapping • Identify best measurement models • Identify moderators and mediators • Aupplimentary analysis: MRQAP	Chapter 4 Chapter 6
Phase 8	Interpretation and Conlusion	• Answer research questions • Draw conclusions • Propose recommendations	Chapter 6, Chapter 7

Figure 4.2 : Key Phases of Research Methodology Adopted in this Study

The research methodology is implemented in eight phases as given below. The following sections of this chapter, provide details of research activities carried out in the fourth phase of the research methodology outlined above.

4.5.1 Stage 1: Problem Definition and Research Design

According to Urbach and Ahlemann (2010), the first research phase requires researchers to define their research question and design the methodology. When focusing on SEM, sufficiently understanding on the phenomenon, possibility of collecting data from required sample sizes should be considered (Marcoulides, Chin et al. 2009). It is also necessary to define the problem domain including the level of analysis (Lewis, Templeton et al. 2005). In particular, the intended external validity will determine the sampling strategy during the data collection phase. It will be then easier to develop clear measurement models and a suitable survey instrument.

This research follows a quantitative research strategy is using PLS-SEM technique. This research strategy is considered suitable for validating the structural relationships in the proposed conceptual model on social capital based inter-organizational collaboration due to a number of reasons discussed in detail earlier in this chapter (section 4.4). SEM allows examining multiple relationships between theoretical constructs in conceptualized models simultaneously (Hair, Anderson et al. 2010). It is widely agreed that PLS-SEM is more suitable for preliminary theory building out of the different types of SEM techniques (Henseler, Ringle et al. 2009, Hair and Lukas 2014, Lowry and Gaskin 2014).

The theory proposed in this study if framed at the firm-level, thus the available sample size is limited. Therefore, consideration is also given to fulfilling the sample size requirement of the selected PLS-SEM approach following the sample size requirements specified by Hair at el, (2014). The criterion used to establish the adequacy of sample size is discussed in detail in the Chapter 5 (Preliminary Data Analysis) of this thesis. PLS technique is especially recommended for small sample sizes (Chin and Newsted 1999, Reinartz, Haenlein et al. 2009).

4.5.2 Stage 2: Literature Review

The constructs, the measurement models, and the structural model, should all be based on strong theory. This research phase aims to identify (1) theories that may serve as a starting point for the researcher's own model development as well as (2) useful construct definitions and measurement models in literature (Urbach and Ahlemann 2010). These objectives are mainly achieved by means of structured literature reviews (Webster and Watson 2002, Fettke, Loos et al. 2005).

A comprehensive review of the literature related to the theories and concepts relevant to the research is conducted, and the findings of previous research relevant to this research are reviewed. An extensive theoretical investigation was carried out reviewing the literature on Social Capital, Inter-Organizational Relations, ICT for Development, Corporate Social Responsibility, Network Science and Structured Equation Modelling. After this background review phase, the knowledge gap was identified and more specific literature review was carried out in order to develop the conceptual model. Such a review is useful to understand what aspects of Social Capital and ICT could support the IORs and identify definitions of constructs and measurement models used to measure similar construct in previous studies. Using existing construct definitions and measurement models whenever possible is recommended, as this reduces the effort required and allows a more effective comparison of the results (Lewis, Templeton et al. 2005). The general review of literature including definitions on concepts adopted for this study is presented in the Chapter 2 of this thesis.

4.5.3 Stage 3: Model Construction

Process of model construction and instrument development is influenced by existing theories, presuppositions deduced from exploratory research and/or the researcher's creativity (Urbach and Ahlemann (2010). "*Although a detailed literature review may provide a number of building blocks for model construction, it is very likely that certain constructs will require new measurement approaches*" (Urbach and Ahlemann 2010).

In this study, both the structural model and measurement models for measuring the theoretical constructs in the model are developed based on the understanding developed from the review of literature conducted in phase two. Many of the measurement indicators for the theoretical constructs were identified in the relevant literature. In order to augment the knowledge identified from the literature, and to identify knowledge specific to the banking domain, initial interviews were carried out with four top managers from two banking organizations. Such technique contributed to the further identification of measurement indicators, moderators, and the barriers to the successful formation of strategic partnerships in the banking domain. Researchers have previously used similar approaches: i.e. starting with interviews and then using an analysis of the information to develop a survey instrument that is administered later to a sample from a population (Ely 1995, Tashiro 2002).

In order to establish the content validity of the measurement models, certain validation steps need to be applied in instrument development. In this study, multiple indicator variables contributing to each of the theoretical constructs (e.g. three dimensions of social capital, IOR, enablers) in the conceptual model are also identified from the review of literature. In SEM, increasing the block size (number of indicators per construct) does not only lead to better estimates, but also lowers the standard errors (Chin 1998) since a larger number of indicators can better explain an LV's variance. It enables the deduction of indicators at a later stage or allow more degrees of freedom during the cyclic process of model validation and optimization (Homburg and Giering 1996).

As this research also intends to explore the difference of network measures and traditional measures, two alternative sets of indicators are identified for each construct leading to two different alternative models. If several alternative blocks of indicators for latent constructs are used, the researcher may apply one or several item screening methods to choose the most appropriate blocks of items (Gefen, Straub et al. 2000, Chan, Woon et al. 2005).

Further alternative models were developed to explore different network measures for the structural dimension of social capital. In order to explore the moderating effects of

ICT related aspects, a set of potential moderators were identified through literature and from the insights gained from discussions with domain experts. To validate this, alternative models were developed. In addition to the main model, this research intends to explore several extended concepts. First, the link between the inter-organizational collaboration and firm performance is investigated. Second, the link between Social Capital, CSR disclosure and firm performance is explored. Accordingly, extended models are developed with limited knowledge on the direction of causality of the relationships. The literature contributing specifically to the development of the conceptual model are discussed in the Chapter 3 of this thesis.

4.5.4 Stage 4: Instrument Development

In the fourth phase, a survey instrument is developed by mapping each indicator variable selected to measure the theoretical constructs in to an item in the survey instrument. Survey questions were designed using the resource generator instruments (Van der Gaag and Snijders 2004, Van Der Gaag and Snijders 2005, Van der Gaag, Snijders et al. 2008) as a basic guide and by reviewing the questions used by Tsai and Ghoshal (1998) and similar items used in previous research. Most of the questions were relational type and the participants were given a list of banks from which they had to choose banks. Some of the indicator variables were not included in the survey (For e.g. Directors' participation in external forums, Syndication loans). They were identified directly through public sources of data such as web sites, annual reports.

Structure of the Survey: The survey instrument is developed in this research to is presented in Appendix C. The instrument comprises of three main sections. The first section of the survey instrument contains questions on general information of participants such as the bank employed in, functional area, experience in banking, academic and professional qualifications and memberships in professional banking associations. The second section of the survey instrument contains questions related to different aspects of social capital of banks. Each question in section two corresponds to the indicator variables used for measuring the three theoretical dimensions of social capital appearing in the conceptual model. The third part of the instrument contains

questions related to various inter-bank formal collaborations such as inter-bank loans, agreements and partnerships. Different versions of questionnaire were designed according to the specific area of focus in the third section (Operations, Treasury, ICT, HR, Marketing,).

The questionnaire was designed to collect both relational and non-relational data. Relational data was obtained through socio-metric techniques. For each relational type question, a list of all banks in Sri Lanka was provided and respondents were asked to indicate the nature of their relations with each bank along a set of dimensions. Since relationships can change over time, the respondents were asked to base their answers on their own experience in the recent past (2013-2015). Non-relational data were gathered mostly through questions using Likert-type scales. Likert scales are widely used in survey instruments due to their simplicity and ease of use (Neuman 2007). Few questions required respondents to select choices from a given list of options such as inter-bank social events. Few other questions were measured as binary values (Yes / No) in order to reduce the complexity. These questions simply measured whether or not a certain ICT capability was available in-house.

Precautions for Method Bias: When developing survey instruments, it is vital to take precautions against common method bias. The common method variance is defined as the ”*variance that is attributable to the measurement method rather than to the constructs the measures represent*” (Podsakoff, MacKenzie et al. 2003 : 879). In this study, several steps are occupied to avoid potential concerns for common method bias. The method bias can occur when participants may not be speaking their true feelings due to some reason (Podsakoff, MacKenzie et al. 2003). To avoid this, the anonymity of the respondents is maintained in this study (Podsakoff, MacKenzie et al. 2003). Names or any personal identification of the participants were not collected in the survey. Method bias can also occur when the questions hint on ‘*what is expected*’ and when respondents try to maintain consistency in their answers (Podsakoff, MacKenzie et al. 2003). To discourage the respondents in maintaining the consistency of the answers, separating survey items (not grouping them together) and reducing ambiguity of items is done (Parasuraman, Grewal et al. 2006). MacKenzie and Podsakoff (2012) identifies that, if the respondents lack the cognitive abilities, experience and

motivation to answer accurately, then satisficing will be the likely result, which lead to common method bias. Therefore, the survey questions were designed as close-ended questions with standardized answers providing much convenience in comparing, coding and analysing the responses (Bailey and Marsden 1999). Also, different versions of the survey are used to collect data on specific aspects in banking. For example, the survey questions specific to ICTs were in a separate section of survey and it was only given to the management of ICT related units in banks to avoid non-response bias and to ensure accuracy and consistency.

Moreover, the survey instrument is developed in English language. In Sri Lanka, English language is widely used in professional domains such as banking. The management level staff in banking organizations, are assumed to have an adequate level of proficiency in English. Respondents tend to skip questions that are difficult to understand. As such, questions with answer choices ensure improved readability and convenience for the respondents (Bailey and Marsden 1999). To reduce the chances of omissions due to time restrictions and ambiguity, '*why a respondent did not answer a certain question*', each question was given choices of '*None of the banks*', '*All of the banks*' and '*Don't Know the Answer*' in addition to the list of banks. If the endogenous variables were collected at the same time and using the same instrument as the exogenous variables, occurrence of bias is possible (Straub, Boudreau et al. 2004). In this study, data for the endogenous variables (dependent) were also separately collected from different sources than the exogenous variables (directly from banks rather than through the survey).

Validity and Improvement: Several measures are taken to improve the reliability and the validity of the survey instrument. Consulting with experts, conducting pilot tests and conducting statistical tests are used to improve the reliability and the validity of the survey instrument. Many authors propose developing the data collection instrument in a cyclic fashion, starting with a large number of indicators and concluding with the most relevant ones. Deductive and empirical procedures could be used to refine measurement models (Lewis, Templeton et al. 2005). Use of pre-tests and pilot tests allow to develop more suitable and improved measurement instruments in terms of the format, content, understandability, terminology, ease of use, or speed

of completion. In this research, the developed survey instrument is reviewed by the supervisory committee and also presented to two panels of experts consisting of banking experts, and peer researchers in Sri Lanka to obtain feedback on the appropriateness of the questions. The feedback obtained from the experts is used to improve the survey instrument in terms of readability, suitability, completeness and response rate.

The improved instrument is used to conduct pilot studies in order to obtain feedback from bankers on the understandability of the questions in the survey instrument. Pilot studies are conducted with 4 bank managers from one state bank and one private bank. Based on the feedback of the pilot study, changes to the presentation of the survey instrument and rewording of questions are done. However, there was not any negative feedback regarding the use of English language in the instrument. The modified survey is reviewed by the participants of the initial pilot study. The feedback received on the modified instrument confirms that it is ready to be deployed. The survey instrument developed in this manner is used to collect data from top managers in the banking organizations in Sri Lanka.

Literature Supporting Survey Questions: To improve reliability of the survey instrument developed for this research, most of the survey items were developed based on similar measurement instruments used in previous research. The survey questions used to measure the structural, relational and cognitive dimensions of social capital in this research that were developed based on similar measurement instruments in literature is summarized below.

To measure the previously identified indicators of the structural, relational and cognitive dimensions of social capital, a set of survey questions were developed using the previous literature that used similar concepts as a guide. Each indicator is mapped to a survey question that was developed based on the previous literature with similar items. Table 4.1 summarizes the literature-based survey questions used to measure the structural, relational and cognitive dimensions of social capital in the firm-level.

Table 4.1 : Literature-based Survey Questions

Indicators	Survey Question	Similar items in literature	
Structural Dimension			
Participation in different inter-bank social events	"Does your bank take part in any of the following common events or groups? Please select all applicable choices from the list provided"	Active participation in given social activities/ organizations	(Edwards 2004; Australian Social Capital Framework and Indicators; The UK Social Capital Measurement Framework)
Frequency of inter-organizational social interactions	"How often does your bank socially interact with other banks in general? (daily, weekly, monthly, annually, more)"	"With people of which units do you spend the most time together in social occasions?"	(Tsai and Ghoshal 1998)
Directors' Social contacts through external affiliations	(Identified through directors' profiles in bank websites.)	-	-
Relational Dimension			
Non-opportunistic trust	"We believe we can rely on this bank without any fear that they will take advantage of us or our bank even if the opportunity arises"	If given a chance, the extent to which the supplier perceives that the automaker will take unfair advantage	Dyer and Chu (2000)
		Inter-organizational trust: Supplier X may use opportunities that arise to profit at our expense	Zaheer et al. (1998)
		Interunit trust - "Please indicate the units which you believe you can rely on without any fear that they will take advantage of you or your unit even if the opportunity arises" –	Tsai and Ghoshal ((1998)
		Salesperson trust: Despite what she/he says, she/he will try to take advantage of me –	Chow and Holden (1997)
Promise keeping trust	"This bank has always kept the promises they made during the past and fulfilled their responsibility in agreements. We can	Salesperson trust: Promises made by this supplier's sales representative are reliable	Gassenheimer and Manolis (2001)
		Inter-organizational trust: Based on past experience, we cannot with complete confidence rely on	Zaheer et al. (1998)

	rely on this bank to abide by any future"	Supplier X to keep promises made to us	
		Inter-unit trust: In general, people from which of the following units will always keep the promises they make to you?"	Tsai and Ghoshal (1998)
		Supplier firm trust: This supplier keeps promises it makes to our firm	Doney and Cannon (1997)
		Company trust: I have found that I can rely on this company to keep the promises that it makes	Chow and Holden (1997)
		Credibility: Promises made by this resource's representative are reliable	Ganesan (1994)
Reputation based trust	"This bank has a good reputation in the industry. Therefore, we would be willing to trust this bank to get the job done properly even without our monitoring"	Company trust: This salesperson's company has a poor reputation	Plank et al. (1999)
		Cognitive trustworthiness This supplier has a good reputation	Mo¨llering (2002)
Cognitive Dimension			
Shared Vision	"Please select other banks that share the same vision and ambitions as your bank."	"Our unit shares the same ambitions and vision with other units at work"	Tsai and Ghoshal (1998)
Shared work norms	"Please indicate the banks that your bank shares a good understanding through shared norms and easier to work with."	-	NEW ITEM
Shared market knowledge	(Identified through public sources)	-	NEW ITEM

Similarly, the survey also included questions related to the inter-bank collaboration and ICT capabilities. Inter-bank collaboration was measured using both survey question and loan data directly obtained from banks. The data was collected from the survey question; "*Please select the banks that you have engaged with in syndication relationships during the last 3 years"*. In parallel, each bank was requested to provide a list of syndications they participated in during the last three years. It is known that

only a few syndications occur per year. For each loan, only the year of each loan and its participant banks was requested and only the data on syndications in last three years was requested to avoid non-responses and to conform to our snap-shot view of other, survey-based data.

As discussed in the section 3.3.2.3, firm-level ICT capability was measured using multiple, industry specific indicators developed based on similar organizational ICT level indicators presented in the literature (Chae, Yen et al. 2005, Bayo-Moriones and Lera-López 2007, Indicators 2010). Data for these items was obtained using survey questions and direct sources. For example, some of the data such as 'the participation in inter-bank shared systems' are obtained through intermediate agency that is managing those systems. Data such as 'availability of certain internal systems', 'availability of ICT related human resources' that is not available publicly nor available at a single point of access, was obtained through the survey. The complete survey instrument developed for this study is presented in the Appendix A.

4.5.5 Stage 5: Data Collection

In this research, data was collected both through a survey as well as from public sources such as web sites and annual reports. In the main data collection stage, the survey instrument developed as above is used to collect responses from the participants (Sekaran 2003). The secondary data collection was started before the primary data collection. The data collected through the public sources included both relational data (such as the numbers of directors having links with which other banks) and per-bank attributes (such as the starting year of the bank and its total assets).

Population and Sample Size

This study is focused on the dynamics of social capital at the inter-organizational-level using the data collected from the finance industry in Sri Lanka. The financial system in Sri Lanka comprises the major financial institutions, such as the Central Bank of Sri Lanka (CBSL), 26 Licensed Commercial Banks (LCBs), 9 Licensed Specialised Banks (LSBs), 48 Licensed Finance Companies (LFCs), Specialised Leasing Companies (SLCs), Primary Dealers (PDs). The banking sector dominates the

financial system and accounted for 58 per cent of the total assets of the financial system as at the end of 2014. The Central Bank influences the Financial Market through its conduct of monetary policy. This study focused on licenced banks (34) in the Sri Lankan financial system.

Statistical Concerns of Sampling: In PLS studies, certain conditions should be fulfilled in data gathering in order for the data to be theoretically and statistically adequate (Bentler 1980). According to Barclay et al. (1995) and Chin (1998), the sample size depends on the number of predictors that are involved in the multiple regressions in the inside and outside approximation. Thus, it is possible to pre-determine the minimum sample size required for the analysis using accepted criteria and standards. The tests of sample size adequacy employed in this study are described in the section 5.4.5 under Priliminary Data Analysis Chapter. PLS technique used in this study is especially recommended for small sample sizes (Chin and Newsted 1999, Reinartz, Haenlein et al. 2009).

Sampling in Social Capital Studies: In addition to the statistical aspects related to sampling, two main sampling approaches have been discussed in social capital literature in particular (Lin 1999), namely, Complete network studies (saturation sampling) and Ego networks studies (ego-network sampling). The saturation sampling (complete network) technique is useful when it is possible to map a definable social network. In such networks, data from all nodes are gathered and their relationships identified, and measurements of network locations can be developed. It is a technique most useful for studies of social capital within an organization or a small network among organizations. For larger and less definable networks, ego-network sampling techniques can be used. Typically, the name-generator technique (McCallister and Fischer 1978, Burt 1984, Marsden 1987) is employed. This measurement technique produces a list of ties from ego. Network resources can also be obtained from the name-generator technique. This study falls into the ‘complete network’ (saturation sampling) category since we intend to study the full network of 34 banking organizations.

Deployment of Survey

As noted earlier, social capital is conceptualized at the firm-level in this study. As the theory and the hypotheses proposed in this study is framed at the level of organizations, the analysis requires measurements at the firm-level. In organizational research, it is common practice to use proxy data from informants when firm-level data are not available from existing sources (Kumar, Stern et al. 1993). In such cases, a multiple informant approach yields superior quality than the single informant approach (Hill 1982). In social capital research, individual managers' or executives' networking relationships are generally used as a proxy for the networking relationships that create social capital for an organization (Galperin, Lituchy et al. 2014).

Participants of the main survey in this study are the senior management staff in the higher management, in the banks in Sri-Lanka. Senior management staff in Operations, Treasury, Human Resources Management and Information Technology units were targeted in the survey. Participants were identified with the help of higher management and through contacts were invited to participate through email.

As per the previous description of the survey, most of the variables were measured at the dyadic level. For each relational measure, respondents had to pick, out of the 34 organizations listed in the survey, the organizations with which his or her firm enjoyed a specific relationship (e.g. which banks do you trust?). To improve the reliability of these dyadic measures and to preclude a single respondent biasing a whole firm's data, multiple (six) respondents per bank were surveyed. The survey reponses were initially recorded as bank per row and later converted to bank x bank metrix form for each item.

Handling Nonresponse Bias: It is necessary to address the issue of nonresponse before, during, and after data collection (King and He 2005, Van der Stede, Young et al. 2005). Nonresponse bias occurs when some of the target respondents do not participate in the survey and cause an unreliable representation of the sample, consequently limiting the study's external validity. **As precaution** against non-response bias, the survey was made available in multiple ways using both distribution of paper-based forms and online form through an email distributing an email with a link to the online version of the same survey. The survey mostly consist of closed

ended questions which is easier to answer. Moreover, different versions of the survey instrument are used for the different categories of participants according to their domain of speciality. These surveys contain a common section which measures social capital aspects and a specific section related to one of the specific areas such as: ICT, HR, Treasury, Operations, Marketing and Corporate Communicaitons).

To improve the response rate **during the data collection**, the researcher sought opportunities for face-to-face meetings or telephone-based meetings with participants and assist in answering the survey. The participants can chose to answer the survey with or without assistance from the researcher. For those who chose to answer the survey with assistance, one-to-one interviews or support telephone calls are scheduled at mutually convenient venues and times. Each session will take approximately 30 minutes. Those who wish to answer the survey on their own will be given a printed version of the survey or directed to the online survey through email according to their preference. The survey responses were collected through online reports and manual forms. The response rate was very low for the initial invitation indicating potential for non-response bias. Therefore, several rounds of telephone follow-ups were used in-order to improve the responses rate of banks. Follow-ups can effectively improve response rates and help bring the more resistant respondents into the study (Van der Stede, Young et al. 2005, De Leeuw and Dillman 2008). A total of 169 responses were collected in the above manner with 3 to 6 responses from each of the banks. Consequently, the study achieved a 100% response rate covering the entire population of banking organizations in the banking industry in Sri Lanka.

4.5.6 Stage 6: Preliminary Data Analysis

The quality of empirical data gathered during the data collection phase needs to be verified (e.g. Lewis, Templeton et al. 2005)before using the data for analysis. After the data gathering, a preliminary analysis was carried out before the analysis stage. First, it was necessary to aggregate responses from individuals to form a firm-level measure for each item as the proposed theory was formulated at the firm-level. Second, it was necessary to transform this data in to different locational properties at the firm-level. These data could then be combined with data on nonrelational measures

in a traditional statistical analysis. In adopting this approach, we emulated many earlier studies that have used a similar research design to considerable advantage (e.g. Ibarra 1993, Powell, Koput et al. 1996, Tsai and Ghoshal 1998).

Next, it was necessary to rule out issues with data that could adversely affect data analysis. A typical subject of analysis is the response rate (Sivo, Saunders et al. 2006). High response rates usually reflect a study's rigor in the eyes of editors, reviewers, and readers (Van der Stede, Young et al. 2005). In this research, a 100% response rate is achieved by obtaining at least 3 responses from each firm out of the population of 34 organizations in this domain. The collected data needs to be screened for impurities. Data screening involves addressing various issues with the collected data, such as missing data and extreme data values that might mislead the data analysis (Hair, Anderson et al. 2010, Meyers, Gamst et al. 2013). In quantitative research, the data collected through surveys may contain missing data values due to reasons such as errors in entering data, and omissions made by the respondents (Hair, Anderson et al. 2010). Missing data values might adversely affect the validity and the reliability of the research outcomes depending on their amount and patterns (Tabachnick and Fidell 2007). In this study, issues of data such as a few missing data values and extreme data values are identified using statistical software and steps were taken to reduce the adverse effect of such data on the data analysis. Moreover, the tests for nonresponse bias, possible common method bias were performed. A detailed discussion of the preliminary analysis carried out in this study is presented in Chapter 5.

4.5.7 Stage 7: Model Validation

The cleaned data from the survey in the banking organizations in Sri Lanka, is then used to validate the conceptual model developed through literature review. Such a validation is useful to comprehend how well each hypothesis proposed is supported and to answer the research questions. Model validation denotes the process of systematically evaluating whether the structural model is supported by the data encompassing (1) the assessment of the measurement models and (2) the assessment of the structural model. In many cases, validation is performed as an iterative process when researchers decide to return to previous steps in order to revise (Urbach and

Ahlemann 2010), such as in the case of removing unfitting indicators and re-assessing the measurement models.

In this study, PLS-SEM is used to validate the proposed conceptual model, encompassing both measurement model and structural model. The selection of this approach has been discussed in detail in the section 4.4 in this chapter. Such techniques are capable of validating the structural relationships in the proposed conceptual model on social capital based inter-organizational collaboration. PLS-SEM also includes techniques for testing moderating effects of other variables.

To analyse the data in this research using PLS-SEM, SmartPLS 3.0 software is used. SmartPLS provide results of PLS algorithm including measurement model validity and structural model validity in the same run whereas the bootstrapping results are produced in a different step. The validation criteria used for this study are explained later in this chapter in the section 4. 7.. A detailed discussion of how the data analysis is conducted in this research is given in the Chapter 6.

4.5.8 Stage 8: Interpretation

During the **final phase**, the research questions of this study are answered based on the results of the data analysis. By answering the research questions, conclusions are drawn on how the three dimensions of social capital drive inter-organizational strategic relationships in the Sri Lankan banking industry. The conclusions and recommendations are summarized in the Chapter 7 of this thesis.

4.6 Aspects of Reliability and Validity

It is vital to establish reliability and validity of research instruments used for the study. The reliability of a research instrument generally refers to the absence of errors in measurement. It enables the same research instrument to be used to reproduce the same results again (Field 2009, Hair, Anderson et al. 2010). The validity of the instrument is concerned with the extent to which the instrument accurately measures what it is intended to measure (Field 2009, Hair, Anderson et al. 2010). Table 4.2 summarizes the multiple steps taken in this study to ensure reliability and validity.

Table 4.2 : Steps Taken for Reliability and Validity

Aspects of reliability and validity	Steps taken for establishing reliability and validity
Reliability	Clear conceptualization of theoretical constructs Use of multiple indicators Test for internal consistency of indicator variables
External Validity	Collection of data from entire population of 34 banks in Sri Lanka
Content Validity	Use of indicators from similar constructs in previous research Expert feedback on the appropriateness of the items in the instrument
Construct Validity	Tests for convergent validity Tests for discriminant validity

To **ensure the reliability** of the survey instrument used in this research, two measures are taken. M**ultiple indicator variables** are used to measure each of the theoretical constructs in the conceptual model. Using multiple indicators to measure theoretical constructs is widely used for improving the reliability of measurement instruments (Neuman 2007). Also, many of the indicators used in the model are identified from other measurement instruments that have been used **to measure similar constructs** in **previous research**.

To **assess the reliability** of the instrument, the **internal consistency** is checked (Hair, Anderson et al. 2010). Internal consistency of a measurement model refers the degree to which all the indicators appointed to measure the same construct are interrelated. In

this research, the internal consistency is assessed using Cronbach's alpha (Byrne 2010, Hair, Anderson et al. 2010) and Composite reliability (Werts, Linn et al. 1974, Nunally and Bernstein 1994). Further, **indicator reliability** was assessed using indicator loadings (Chin 1998). It measures how much of the indicators variance is explained by the corresponding LV.

The validity of the research should be established in terms of **external validity, content validity, and construct validity** (Vogt 2007, Hair, Anderson et al. 2010). **External validity** refers to the degree to which the results of the research could be generalized (Vogt 2007). To improve the external validity, the representativeness of the sample can be considered. In this study, the **complete set of banks were included in the survey** reaching 100% representativeness of entire population. Here, the data were collected from all 34 banks operating in Sri Lanka including state owned banks, private banks and foreign banks. The **content validity** is concerned with whether the indicator variables of an instrument correspond well to the conceptual definition of that construct (Vogt 2007, Hair, Anderson et al. 2010). In order to maintain the content validity of the research instrument, the **indicators are selected** by referring to existing research instruments for measuring similar theoretical constructs. Also, the research instrument developed for this research is reviewed by a **panel of experts** consisting of academics, peer researchers and banking experts whose feedback is used to improve the content validity of the research instrument. The **construct validity** determines how much the indicator variables selected to measure theoretical constructs actually measure those designated constructs (Vogt 2007, Hair, Anderson et al. 2010). C**onvergent validity** and **discriminant validity** are used in this research to assess the construct validity of the theoretical constructs (Vogt 2007, Hair, Anderson et al. 2010). To measure the convergent validity, Average variance extracted (AVE) is assessed and for discriminant validity, cross loadings and Fornell and Larcker Criterion (Fornell and Larcker 1981) are used.

While the appropriate tests of reliability and relevant criteria for this study is explained in the section 4.7 and the application of those tests and the relevant results are presented in the Chapter 6.

4.7 Structural Equational Modeling (SEM)

4.7.1 What is a Structural Model?

As discussed before, this research uses the Partial Least Squares based SEM technique to validate the proposed theory. To assess a theory, SEM uses a set of Latent Variables (LVs) interrelated through structural relationships (Byrne 2010, Hair, Anderson et al. 2010). In general, a model consists of two different sub-models. The inner model (structural model) comprises the relationships between the theoretical constructs whereas the outer model (measurement model) specifies the relationships between theoretical constructs and their respective observed indicators. The unobservable theoretical constructs that are required to describe the phenomenon explained by the proposed theory can be modelled using latent variables (LVs). While the independent LVs are referred to as exogenous variables, the dependent LVs are referred to as endogenous variables. For each LV, a measurement model has to be defined using observable indicator variables (Byrne 2010, Hair, Anderson et al. 2010). In the measurement models, each set of indicators for a construct acts collectively (as a variate) to define the construct. In the structural model, constructs are related to one another in correlational and dependence relationships. The combination of both the structural model and measurement models form a complete structural equation model.

4.7.2 PLS-SEM Process

This study follows the process model for PLS-SEM research presented by Urbach and Ahlemann (2010). A number of steps are involved in the SEM analysis (Hair, Anderson et al. 2010) as shown in the figure 4.1. Firstly, a theory is formulated in which relationships among a set of theoretical constructs are hypothesized based on the literature. The measurement model is then developed using blocks of observable indicators representing the theoretical constructs. A suitable sample is selected and the data is collected, which is followed by a preliminary analysis. Next, the proposed theory is estimated for validity using the PLS-SEM algorithm based on the collected data to obtain empirical evidence on its validity. When the measurement models lack validity, modifications can be done to improve them. The structural model could be assessed to understand the validity of the hypothesized relationships among the

theoretical constructs. Conclusions are then drawn on the validity of the hypotheses. In many cases, validation is performed as an iterative process when researchers return to previous steps to revise (Urbach and Ahlemann 2010), such as in the case of removing unfitting indicators and re-assessing the models.

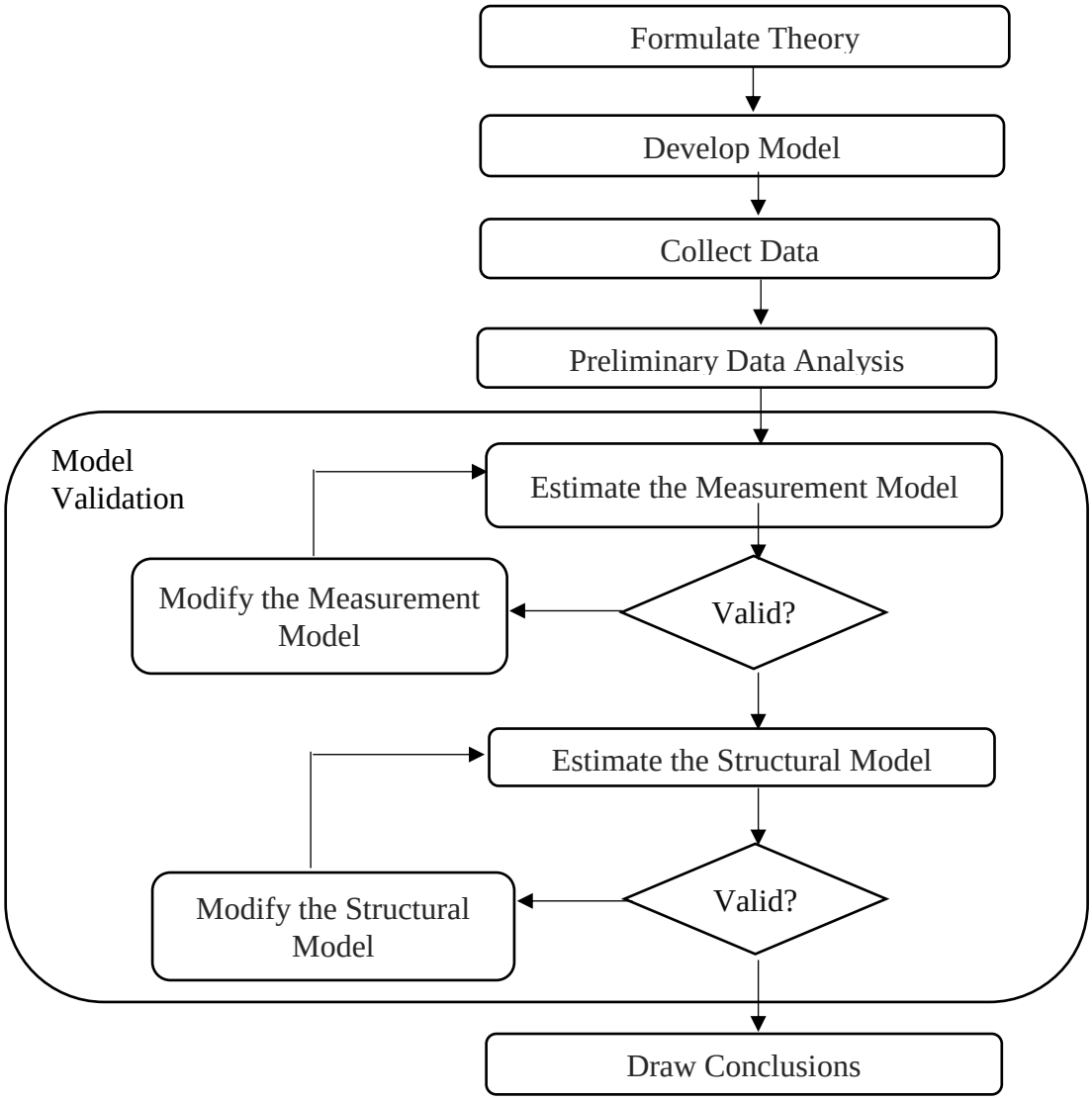

Figure 4.3 : PLS-SEM Process

4.7.3 Software Tools for PLS

With the growing interest in PLS SEM, several software tools became available. The popular software tools for PLS path modeling are LVPLS (Adelman, Lohmoller et al. 1987), PLS-Graph (Chin 2001), PLS-GUI (Li 2005), SmartPLS (Ringle, Wende et al. 2005), SPAD PLS Path Modeling, and VisualPLS (Fu 2006). In

this study, SmartPLS 3 Student version is used. SmartPLS is a user-friendly modelling package for partial least squares (PLS-SEM) analysis. Student version is free, supports all algorithms, but data are restricted to 100 observations although the number of projects is unlimited. In addition to the easy to use interface for model development, SmartPLS facilitates the estimation of measurement model and structural model in the same run. However, SmartPLS requires the users to carry out separate steps in order to use re-sampling methods or moderator analysis. This study uses the results produced by SmartPLS software to establish a number of reliability and validity criteria for both the outer and inner models. The validation criteria are discussed in detail later in this chapter.

4.7.4 PLS Algorithm

The PLS algorithm is a process of systematically evaluating whether the structural model is supported by the data or not. PLS-SEM assessment typically follows a two-step process that involves separate assessments of the measurement models and the structural model (Hair, Ringle et al. 2011). Hair et al. (2011) and Henseler et al. (2012) provide detailed explanations on how the basic PLS algorithm operates as it is implemented in SmartPLS 3.0. The PLS algorithm consists of a preparatory phase, an iterative main procedure, and a final phase (Chin 1998) as shown in the figure 4.4.

During the first phase, all variables are standardized. Consequently, both outer model and inner model path coefficients vary from 0 to plus or minus 1, with paths closest to absolute 1 being the strongest. In the second stage (main procedure), the Latent Variables' (LV) scores are estimated using an iterative procedure. This stage consists of two main steps. The first step, which is called 'outside approximation' estimates all LVs as weighted aggregates of the measured variables (MVs). This estimation is done by allocating equal weights to each block of indicators. Using these weights, LV scores are calculated for each of the cases. Latter iterations calculate better weights based on the data and the proxies obtained from the next step. The calculation of the weights is done by regression. The second step, named as 'inside approximation', creates proxies for each endogenous LV based on its association with other LVs. The results of this

regression are new LV proxies for the next iteration. The algorithm stops when an iteration does not lead to a significant improvement of the LV estimates. The third stage calculates the final estimates of the outer weights, loadings and the path coefficients. During this phase, factor loadings, path coefficients and validation measures are computed. The user obtains weights for all the formative indicators, loadings for all reflective indicators, and coefficients for all paths between LVs. In addition, most programs (such as SmartPLS) automatically calculate basic validation measures.

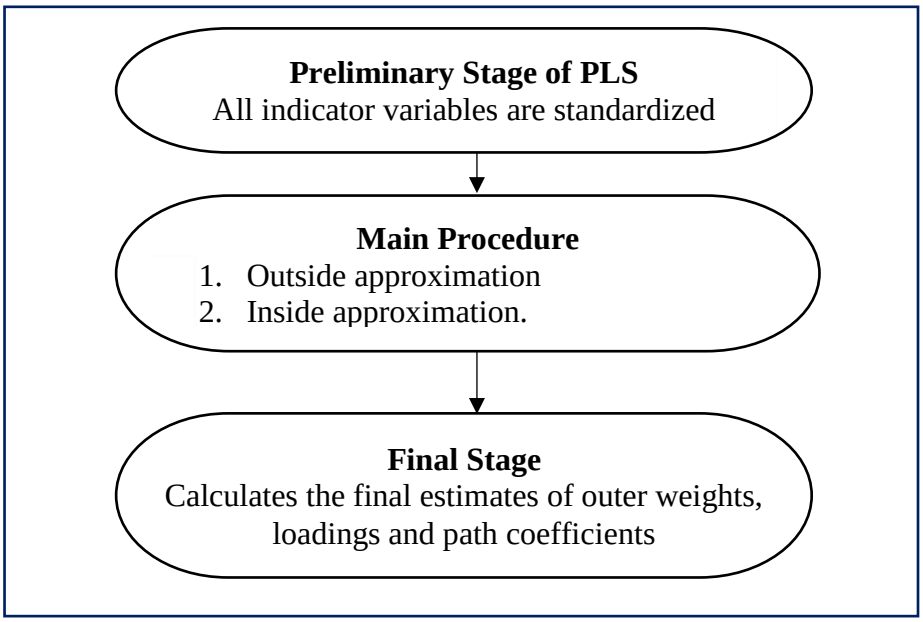

Figure 4.4 : Stages of PLS Algorithm

4.7.5 Assessment of Measurement Models

In SEM, a measurement model (outer model) specifies the indicators for each latent construct. There are two ways in which indicators of each construct can be modelled. In Reflective measurement models, indicators are considered 'effects' of the Latent Variables (LVs). In other words, the LVs cause or form the indicators (Chin 1998). All reflective indicators measuring one construct should correlate positively and are interchangeable. This means that, it is possible to drop one indicator without altering the conceptual domain measured. On the other hand, formative indicators form the LV (Chin 1998). These indicators are viewed as the conditions under which the LV is realized. As there is no direct causal relationship from the LV to the indicators, formative indicators may not correlate or may even be inversely related (Bollen 1984).

However, dropping one indicator will alter the conceptual domain measured. It is important to distinguish between reflective and formative measurement models before discussing the specific evaluation criteria of measurement models (Henseler, Ringle et al. 2009). Figure 4.5 shows a graphical representation of the two types of measurement models.

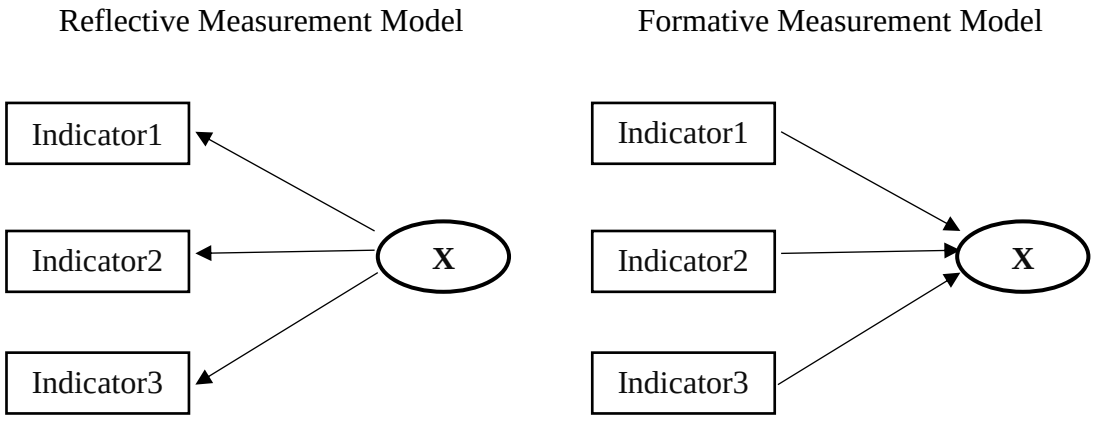

Figure 4.5 : Reflective vs Formative Measurement Models

While reflective measurement models are widely used, only a small proportion of studies have applied formative measurement models. Several authors have specifically reviewed the reflective and formative measurement models in structured equation modelling (Jarvis, MacKenzie et al. 2003, Urbach and Ahlemann 2010, Bagozzi 2011). A review of the application of formative measurement models has been published by Diamantopoulos et al. (2008). However, a significant number of studies have used misspecified measurement models (Urbach and Ahlemann 2010). Petter et al. (2007) showed that 30 percent of structural equation models in leading IS journals were subject to such misspecifications. Researchers should carefully design their measurement models so that a block of indicators is either completely formative or completely reflective (Urbach and Ahlemann 2010). Moreover, the assessment of validity need to correspond with the chosen mode of indicators in the measurement model. PLS approach is applicable to both reflective and formative models (Henseler, Dijkstra et al. 2014).

In SEM, a measurement model is used to assess how well, the indicators used to represent theoretical constructs, represent those constructs. Similarly, in the PLS

assessment, it is necessary to establish the validity of the measurements used to measure the latent constructs in the model (Hair, Sarstedt et al. 2014). A measurement model, associating measured variables with constructs and loadings of variables on factors, is similar to a factor analysis (Hair, Anderson et al. 2010).

The assessment of measurement model in SEM is done through a procedure similar to a CFA (Hair, Anderson et al. 2010). The first step is the conceptualization of the theoretical constructs and the selection of suitable indicators to represent them. To improve the validity of the indicators, steps such as adopting previous research instruments, obtaining expert consultations and pre-testing the instruments are taken. The details of identification of suitable indicators from literature and the data collection strategy used in this research was described earlier in section 3.4 and 4.5. In the second step, the full measurement model is developed, consisting of theoretical constructs, the indicators representing those constructs and the relationships between constructs. Then, the data is collected from the selected sample and finally, the specified measurement model is estimated and the empirical measures are examined. If the measurement model reliability and validity is not established, it is not suitable to use them to examine the structural relationships in the model. Therefore, the unfitting measurement models can be improved by removing the unfit indicators (Hair, Anderson et al. 2010). Such indicators may be considered for removal or reassignment to other latent variables (Hair and Lukas 2014). The following sections provide details of assessments of validity for the two types of measurement models.

4.7.5.1 Reflective Measurement Models

Reflective measurement models in PLS should be assessed with regard to their reliability and validity (Hair, Sarstedt et al. 2014). In a reflective measurement model, arrows go from the factor to the indicator variables, signifying that a unidimensional underlying construct determines the values of the measured indicators. Assessments of uni-dimensionality, internal consistency reliability, indicator reliability, convergent validity, and discriminant validity should be carried out by applying standard decision rules (Straub, Boudreau et al. 2004, Lewis, Templeton et al. 2005). The criteria for assessing reflective measurement models are summarized in the table 4.3 and

explained in the following sections. These criteria will be used to discuss the measurement model validity in the Chapter 6.

Table 4.3 : Assessment Criteria for Reflective Measurement Models

Validity Type	Criterion	Description	Literature
Internal consistency reliability	Cronbach's alpha (CA)	CA values range from 0 (completely unreliable) to 1 (perfectly reliable). For confirmative (explorative) research: CA > .800 or .900 (0.700). Values must not be lower than .600.	Cronbach (1951), Nunally and Bernstein (1994)
Internal consistency reliability	Composite reliability (CR)	CR values can range between 0 (completely unreliable) and 1 (perfectly reliable). Proposed threshold value for confirmative (explorative) research: CA > .800 or .900 (0.700). Values must not be lower than .600.	Werts et al. (1974), Nunally and Bernstein (1994)
Indicator reliability	Indicator loadings	Indicators loadings higher than .70 is accepted. For exploratory research designs, lower thresholds (.050) are acceptable. The significance can be tested using bootstrapping	Chin (1998b)
Convergent validity	Average variance extracted (AVE)	Proposed threshold value: AVE > 0.500.	Fornell and Larcker (1981)
Discriminant validity	Cross-loadings	If the loading of each indicator is higher for its designated construct than for any of the other constructs, and each of the constructs loads highest with its own items, the constructs differ sufficiently from one another.	Chin (1998b)
Discriminant validity	Fornell-Larcker criterion	AVE of each LV should be greater than the LV's highest squared correlation with any other LV.	Fornell and Larcker (1981)
Discriminant validity	heterotrait-monotrait ratio of correlations (HTMT)	If the HTMT value is below 0.90, discriminant validity has been established between two reflective constructs.	Henseler, Ringle and Sarstedt (2015)
Measurement Model Fitness	The standardized root mean square residual (SRMR)	A model has good fit when SRMR is less than .08 or less than .10	(Hu & Bentler, 1998). (Henseler, et al. 2014)

Reliability Criteria

Construct reliability assessment usually focuses on composite reliability as an estimate of a construct's internal consistency. The tests of internal consistency reliability and the indicator loadings are used for this purpose. The construct reliability also is an indicator of the convergent validity (Hair, Anderson et al. 2010).

Internal Consistency Reliability: The **Composite Reliability (CR)** is used which refers to the internal consistency of indicators measuring the underlying factors (Fornell and Larcker 1981). The rule of thumb of CR is that 0.7 or higher implies good reliability (Hair, Anderson et al. 2010 : 710). According to Hair et al., (2014), "compared to **Cronbach's alpha**, composite reliability does not assume that all indicators are equally reliable, making it more suitable for PLS-SEM, which prioritizes indicators according to their reliability during model estimation". In exploratory studies, adequate composite reliabilities should be equal to or greater than 0.6, whereas it should be equal to or greater than 0.70 for confirmatory purposes (Chin 1998, Hair, Ringle et al. 2011, Henseler, Ringle et al. 2012). Some authors consider a value equal to or greater than .80 is good for confirmatory research (for e.g. Daskalakis and Mantas 2008 : 288).

Indicator Reliability: Indicator Loadings (or factor loadings) refers to the correlation between an indicator variable and the theoretical construct it represents (Hair, Anderson et al. 2010). Each indicator's absolute standardized loading should be higher than 0.70 (Chin 1998, Hair, Sarstedt et al. 2014). As recommended by Hair et al. (2010 : 117, 708), the indicator variables are expected to load on only one construct with a factor loading of 0.5 or above in EFA. In CFA, the regression weights are expected to be 0.5 or higher with significant t-values (t-value $\geq$ 1.96 at a ¼ 0.05). Generally, indicators with loadings between 0.40 and 0.70 are considered for removal from the measurement model if deleting this indicator leads to an increase in composite reliability. Weaker indicators are sometimes retained on the basis of their contribution to content validity. Indicators that exhibit very low loadings of 0.40 and lower should be eliminated. High factor loadings are considered as indicators of the convergent validity (Hair, Anderson et al. 2010).

Validity Criteria

Construct validity involves the evaluation of the degree to which a measure correctly measures what it is supposed to measure (Malhotra, Kim et al. 2006, Hair, Anderson et al. 2010). To assess the validity of the reflective measurement models, convergent validity and discriminant validity tests are used (Hair, Sarstedt et al. 2014).

Convergent Validity: The convergent validity refers to the "extent to which indicators of a specific construct converge or share a high proportion of variance in common." (Hair, Anderson et al. 2010 : 678). To examine the convergent validity, the **average variance extracted (AVE)** is examined. AVE refers to the "average percentage of variation explained (variance extracted) among the items of a construct" (Hair, Anderson et al. 2010: 661). It is calculated as the total of the squared SFLs divided by the number of indicator variables being considered (Hair et al., 2010). An AVE value of 0.50 and higher indicates a sufficient degree of convergent validity, meaning that the Latent Variable (LV) explains more than half of its indicators' variance (Hair, Ringle et al. 2011). If the AVE is less than 0.50, the construct, is questionable (Fornell and Larcker 1981).

Discriminant Validity: The discriminant validity is the extent to which the measures of the constructs are distinctly different from each other. It provides evidence for the uniqueness of the constructs in the model (Hair, Anderson et al. 2010). Several tests can be used to assess discriminant validity. First, the **Fornell–Larcker criterion** (Fornell and Larcker 1981) assumes that a latent construct shares more variance with its assigned indicators than with another LV. Second, the AVEs of the constructs should be greater than the square of the correlation between them (Fornell and Larcker 1981). The AVE of each latent construct should be greater than the latent construct's highest squared correlation with any other latent construct. Third, **Cross Loadings** can be assessed, which means that an indicator's loading with its associated latent construct should be higher than its loadings with all the other constructs (Chin 1998). Fourth, Henseler, Ringle and Sarstedt (2015) show by means of a simulation study that above approaches do not reliably detect the lack of discriminant validity in common research situations. They propose an alternative approach, based on the multitrait-

multimethod matrix, to assess discriminant validity: the **heterotrait-monotrait ratio of correlations (HTMT)**. In a well-fitting model, HTMT ratio should be below 1.0 (Henseler, Ringle et al. 2015). Henseler, Ringle, & Sarstedt (2015: 121) suggest that if the HTMT value is below 0.90, discriminant validity has been established between a given pair of reflective constructs.

Improving Reflective Measurement Models

Once the measurement model has been estimated using collected data, the model may or may not satisfy the above validity criteria. To improve the fitness of the full measurement model modifications can be made based on several criteria. In reflective measurement models, Indicator variables with factor loadings lesser than 0.5 could be deleted to improve the fitness of the model (Hair, Anderson et al. 2010). Generally, indicators with loadings between 0.40 and 0.70 are considered for removal from the measurement model if deleting this indicator leads to an increase in composite reliability. Indicators that exhibit very low loadings of 0.40 and lower should be eliminated. In reflective measurement models the full measurement model can be decomposed into several one factor congeneric models and their fitness is examined separately using data collected and steps can be taken to improve the fitness based on above criteria.

4.7.5.2 Formative Measurement Models

Indicators in a formative measurement model represent the independent causes of the construct being measured and do not necessarily correlate highly. Also, formative indicators are also assumed to be error free (Edwards and Bagozzi 2000). Therefore, validation of formative measurement models requires a different approach than the one applied for reflective models. Different criteria for assessing formative measurement models are summarized in the table 4.4.

The concepts of internal consistency reliability and convergent validity are not meaningful in formative measurement models (Garson 2016). Whereas reliability becomes an irrelevant, the examination of validity becomes crucial criterion for assessing formative measurement (Diamantopoulos and Siguaw 2006). Moreover,

theoretical rationale and expert opinion play a more important role in the evaluation of formative measurement models (Hair, Sarstedt et al. 2014). Henseler et al. (2009) suggest assessing the validity of formative constructs on two levels: the indicator and the construct levels.

Table 4.4 : Assessment Criteria for Formative Measurement Models

Validity Type	Criterion	Description	Literature
Indicator validity	Indicator weights	Significance at the .050 suggests indicator is relevant, (sufficient level of validity). Some authors also recommend path coefficients greater than .100 or .200.	Chin (1998b), Lohmöller (1989)
Indicator validity	Variance inflation factor (VIF)	Acceptable values are below 10.	Cassel and Hackl (2000), Diamantopoulos and Siguaw (2006), Fornell and Bookstein (1982), Gujarati (2003)
Multicollinearity	variance inflation factor (VIF)	VIF coefficients should not be higher than 4.0 (some use the more lenient criterion of 5.0).	Cassel and Hackl 2000; Diamantopoulos and Winklhofer 2001
Construct validity	Nomological validity	Relationships between the formative construct and other constructs that have been sufficiently referred to in literature, should be strong and significant.	Henseler et al. (2009), Peter (1981), Straub et al. (2004)
Construct validity	Inter-construct correlations	If the correlations between the formative and other constructs are below .700, the constructs differ sufficiently from one another.	Mackenzie et al. (2005), Bruhn et al. (2008)

Indicator-Level Validity

Significance of Indicator Weights: Firstly, the indicators' relevance to the construct can be assessed by checking whether it significantly contributes to the formative construct (Hair, Sarstedt et al. 2014). The bootstrapping can be used to test the **significance of formative indicators' weights** (Efron and Tibshirani 1994). Significance at the .050 level suggests that an indicator is relevant for the formative index and, demonstrates adequate level of validity (Chin 1998). In addition to considering the significance of the indicator's weight, researchers should also evaluate an indicator's absolute importance for its construct (i.e., the loading) (Hair, Ringle et al. 2011). If both weight and loading are nonsignificant, there is no empirical support for the indicator's relevance to the formative index (Cenfetelli and Bassellier 2009). Some authors recommend assessing **path loading significance** as an indicator of adequate indicator reliability (Chin 1998). The path coefficients greater than .100 or .200 is considered adequate (Chin 1998).

Multicollinearity: Secondly, an indicator's validity is assessed by checking if the indicator can become redundant due to high levels of multicollinearity in the formative measurement model. However, multicollinearity is not an issue for reflective models where the Latent Variable (LV) is modelled as a single predictor of the values of each of the dependent indicator variables (Garson 2016). To determine the redundancy of formative indictors, the degree of multicollinearity could be assessed using **variance inflation factor (VIF)** (Cassel, Hackl et al. 1999, Grewal, Cote et al. 2004, Garson 2016). The VIF indicates how much of an indicator's variance is explained by the other indicators of the same construct or how redundant the indicator is. Values below the commonly accepted threshold of 10 indicate that multicollinearity is not an issue (Diamantopoulos and Siguaw 2006). In the context of PLS-SEM, a VIF value of 5 indicates potential multicollinearity problems (Hair, Sarstedt et al. 2014). It implies that 80 percent of an indicator's variance is accounted for by the remaining formative indicators in the same construct. As such, a value below 5 (or more stringent cut-off value of 4) is considered acceptable.

Construct-Level validity

Nomological validity: The first step for assessing construct validity could be a test for nomological validity. Nomological validity means that, within a net of hypotheses, the formative construct behaves as expected. The relationships between the formative construct and other models' constructs, which have been sufficiently referred to in prior literature, should be strong and significant (Straub, Boudreau et al. 2004, Henseler, Ringle et al. 2009).

Inter-construct correlations: Construct validity could be further assessed also by checking discriminant validity. Therefore, MacKenzie et al. (2005) suggest testing the inter-construct correlations between formative constructs as well. Correlations between formative and all other constructs of less than .700 indicate sufficient discriminant validity (Bruhn, Georgi et al. 2008).

Improving Formative Measurement Model

To improve the fitness of the formative measurement models, modifications can be made based on several criteria. In formative measurement models, removal of an item may omit a unique part of the composite and may change the meaning of the variable (Jarvis, MacKenzie et al. 2003) unlike reflective models. In formative measurement models, indicators can be carefully considered for removal if;

- Both weight and loading are nonsignificant (Cenfetelli and Bassellier 2009) and if the indicator's inclusion is not well supported by theoretical conceptualization of the measure (Henseler, Ringle et al. 2009, Hair, Sarstedt et al. 2014).
- The level of multicollinearity is very high (a VIF of 5 or higher) (Hair, Sarstedt et al. 2014).
- The remaining indicators sufficiently capture the domain of the construct under consideration (Hair, Sarstedt et al. 2014).
- It is also possible to interpret the empirical finding as opposing the conceptual foundations supporting the indicator.

It is important to note that the higher the number of indicators in a formative latent construct, the more likely for one or more indicators to have low or nonsignificant weights. If this is the case, indicators should be grouped into two or more distinct constructs, provided there is theoretical support for this step (Cenfetelli and Bassellier 2009).

4.7.6 Assessment of Structural Models

A structural model shows hypothesized relationships between the unobservable theoretical constructs (Byrne 2010, Hair, Anderson et al. 2010). It consists of both the theoretical constructs and the hypothesized relationships between them. An arrow is drawn from one construct to another if a dependency relationship is expected among the two constructs.

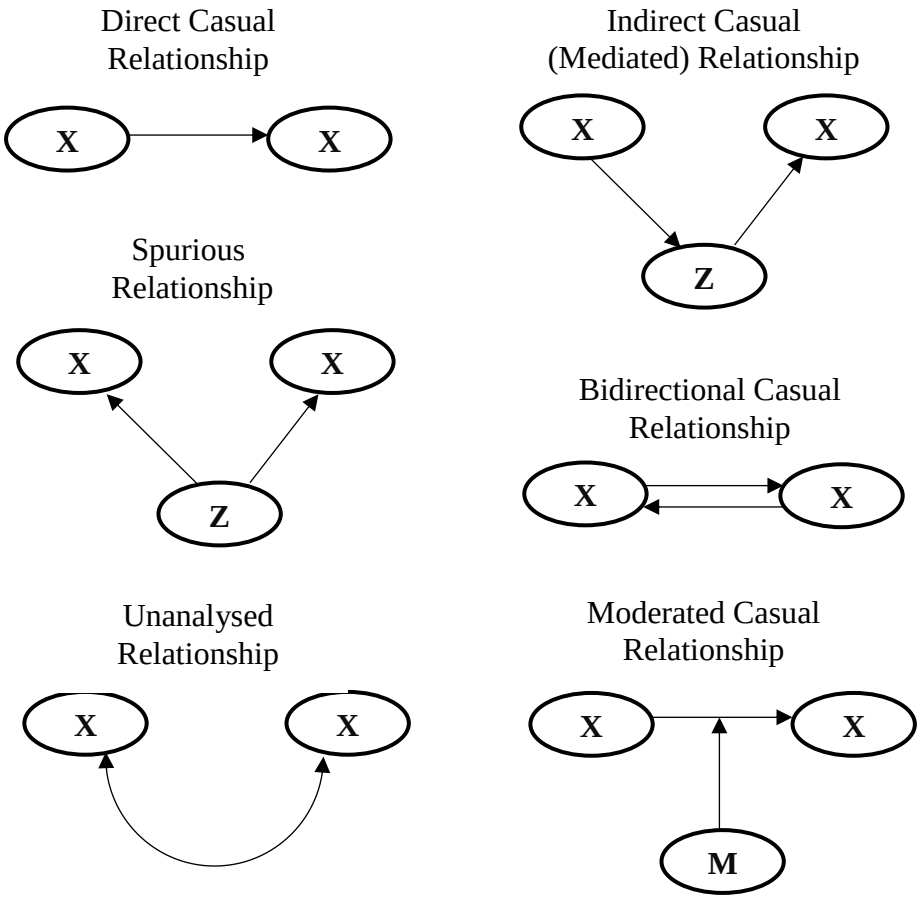

Figure 4.6 : Types of Structural Relationships (Jaccard and Turrisi, 2003)

According to Jaccard and Turrisi (2003), five other types of relationships can occur in structural models, in addition to the direct effect of an independent variable on a dependent variable: (1) mediating effects (an independent variable, X, has an impact on a third variable, Z, which then influences the dependent variable, Y); (2) spurious effects (a correlation between two variables is caused by a common cause, Z); (3) bidirectional effects (two variables, X and Y, influence each other); (4) unanalysed effects; and (5) moderating effects (interaction effects) (a moderator influences the strength of the direct effect between the independent variable, X, and the dependent variable, Y). While the detection and estimation of direct effects is a central domain of PLS path modelling, researchers may further analyse other effects in PLS path models depending on the nature and depth of analysis. A graphical representation of these types of relationships is given in the figure 4.6.

After the validity of the measurement model (outer model) is established, the structural model (inner model) can be analysed (Hair, Anderson et al. 2010). PLS-SEM lacks global Goodness of Fit (GoF) measures unlike CB-SEM (Henseler et al., 2014). While the fit statistics for CB-SEM are derived from the discrepancy between the empirical and the theoretical covariance matrix, PLS-SEM focuses on the discrepancy between the values of the dependent variables and the values predicted by the model (Hair, Sarstedt et al. 2012). Although a global GoF measure for PLS-SEM has been proposed (Tenenhaus, Amato et al. 2004), research shows that the measure is unsuitable for identifying misspecified models (Henseler, Ringle et al. 2012).

As a consequence, researchers using PLS-SEM rely on measures indicating the model's predictive capabilities to judge the model's quality (Henseler, Dijkstra et al. 2014). Nevertheless, a number of authors have discussed the appropriate validity criteria for PLS based structural models (e.g. Henseler, Ringle et al. 2009, Chin 2010, Urbach and Ahlemann 2010, Hair, Ringle et al. 2011, Henseler, Ringle et al. 2012, Lowry and Gaskin 2014) whereas some authors specifically discussed the structural model validity using SmartPLS software (e.g. Wong 2013, Garson 2016).

R Square (R^2): The first essential criterion for the assessment of the PLS structural equation model is each endogenous LV's coefficient of determination (R2). R2

measures the relationship of an LV's explained variance to its total variance. This is the most common effect size measure in path models. In SmartPLS output, the R-square values are shown inside the blue ellipses for endogenous LVs (Garson 2016). The values should be sufficiently high for the model to have a minimum level of explanatory power. The judgment of what R^2 level is high depends, however, on the specific research discipline (Hair, Sarstedt et al. 2014). In the area of information systems, Chin (1998) considers values of approximately .670 substantial, values around .333 average, and values of .190 and lower weak. In Marketing Research, Henseler (2009) proposed a rule of thumb for acceptable R2 with 0.75, 0.50, and 0.25 are described as substantial, moderate and weak respectively. In basic practice of statistics and Business research (Zikmund 2000), R2 values of 0.7, 0.5 and 0.3 are generally considered weak, moderate and strong effects.

Structural Path Coefficients: The assessment of structural model also comprises the evaluation of the path coefficients between the latent constructs. Therefore, the researcher should check the path coefficient's algebraic sign, magnitude, and significance (Urbach and Ahlemann 2010). As data are standardized, path coefficients vary from -1 to +1. Weights closest to absolute 1 reflect the strongest paths. Weights closest to 0 reflect the weakest paths (Garson 2016). If the sign of the path coefficient is opposing the theoretically assumed relationship, the proposed hypotheses is not supported. A path coefficient's size indicates the strength of the relationship between two LVs.

Structural Path Significance: Furthermore, the P value for the structural relationships provide empirical evidences on the significance of the structural relationships (Byrne 2010, Hair, Anderson et al. 2010). In general, path coefficients should be significant at least at the .050 level (Garson-2016). In order to determine the significance, resampling techniques such as bootstrapping (Efron and Tibshirani 1994) should be used. SmartPLS packages uses bootstrapping which involves taking random samples and randomly replacing dropped values. Based on the significance of the relationships, the corresponding hypotheses are accepted or rejected leading to derive conclusions (Hair, Anderson et al. 2010). As such, a non-significant path may call for

re-specifying the model without that path, or the researcher may wish to retain the path in the model for reasons of theoretical importance.

F Square (f^2): It is also possible to evaluate the effect size of each path in the structural model by means of Cohen's f2 (Cohen 1988, Cohen, Manion et al. 2013). The effect size tests if an independent construct has a substantial impact on a dependent construct. It is calculated as the increase in R2 of the construct to which the path is connected, relative to the construct's proportion of unexplained variance (Chin 1998). The f-square expresses how large a proportion of unexplained variance is accounted for by R2 change (Hair, Sarstedt et al. 2014 : 177). However, SmartPLS outputs the f-square values for the researcher. Values above 0.02, 0.15 and 0.35 indicate that an exogenous Latent Variable (LV) has a "small", "medium", or "large" effect on an endogenous LV respectively (Cohen 1988, Chin 1998, Gefen, Straub et al. 2000).

Q Square (Q^2): Another assessment of the structural model involves the model's capability to predict (Hair, Sarstedt et al. 2014). The predominant measure of predictive relevance is the Stone–Geisser's Q^2 (Geisser 1974, Stone 1974), which assumes that the model must be able to adequately predict each endogenous latent construct's indicators. The Q^2 value is obtained by using a **blindfolding** procedure, a resampling technique that omits every d^{th} data point part and uses the resulting estimates to predict the omitted part (Hair, Sarstedt et al. 2014). The omission distance 'd' must be carefully chosen so that the number of data points divided by d is not an integer. In practice, d values between 5 and 10 are identified to be beneficial (Hair, Anderson et al. 2010). The blindfolding procedure is only applied to endogenous latent constructs with reflective measurement models. The Q^2 outcome, 'the cross-validated redundancy' uses the PLS estimates of both the structural and the measurement models for data prediction and fits well for the PLS-SEM approach. Positive Q^2 values confirm the model's predictive relevance in respect of a particular construct (Urbach and Ahlemann 2010). The better the model's predictive relevance, the greater Q^2 becomes (Fornell and Cha 1994). In line with the effect size f^2, the predictive relevance's relative impact can be assessed by means of the measure Q^2.

Multicollinearity: Multicollinearity exists when two or more independent variables are highly intercorrelated, inflating standard errors. If multicollinearity is present in a model, it is not possible to use path coefficients to reliably judge the importance of predictor variables. To evaluate multi-collinearity in the inner (structural) model, VIF criteria can be applied. As a rule of thumb, if the structural VIF coefficients are not be higher than 4.0 (some use the more lenient criterion of 5.0), then the model is considered free of multi-collinearity issues. If multicollinearity is flagged, the researcher should consider merging those constructs into a more general factor or if one is redundant and might be dropped. Factors should be retained in the model if it is clear they measure different things and are theoretically relevant.

Adjusted R^2: A large number of predictors in a regression model may lead to an increased R2, although they have only minor correlation with the dependent variable. As a remedy for such a bias, adjusted R2 may be used. Adjusted R2 is output by SmartPLS. The table 4.5 presents a summary of assessment criteria used for structural model evaluation detailed in the above sections.

Table 4.5 : Assessment Criteria for Structural Models

Criterion	Description	Literature
Coefficient of determination (R^2)	Values of approximately .670 are considered substantial, values around .333 moderate, and values around	Chin (1998), Ringle (2004)
Path coefficients	Path coefficients between the LVs should be analysed in terms of their algebraic sign, magnitude, and significance	Huber et al. (2007)
Path significance (bootstrapping)	Path coefficients between the LVs should be analysed for their significance	Efron (1979); Efron and Tibshirani (1993)
Effect size (f^2)	Values of .020, .150, .350 indicate the predictor variable's low, medium, or large effect in the structural model.	Cohen (1998), Chin (1998b), Ringle (2004
Predictive relevance (Q^2)	Higher Q2 suggests better predictive relevance. Modifications to a model may be evaluated by comparing the Q2 values. The accepted threshold is Q2 > 0.	Stone (1974), Geisser (1975), Fornell and Cha (1994

Model Fit Criteria

Although PLS-SEM lacks global Goodness-of-Fit (GoF) measures unlike CB-SEM (Henseler, Dijkstra et al. 2014), a certain model validation process has been found to be reasonable in practice (Hair, Ringle et al. 2011, Henseler, Dijkstra et al. 2014, Dijkstra and Henseler 2015). This model fit criteria have been recently implemented in SmartPLS package. Appropriate model fit criteria for PLS models are discussed in sections below and summarized in the table 4.6.

Table 4.6 : Assessment Criteria for Model Fit

Model Fit Criteria	Results of Analysis
SRMR	SRMR should be less than .08 (Hu & Bentler, 1998)
d_ULS	Difference should be non-significant ($p > 0.05$).
d_G	

Standardized Root Mean Square Residual (SRMR): Henseler et al. (2014) introduced the SRMR as a goodness of fit measure for PLS-SEM that can be used to avoid model misspecification. SRMR is a measure of approximate fit of the model. It is defined as the difference between the observed correlation matrix and the model-implied correlation matrix. Usually, a model has good fit when SRMR is less than .08 (Hu and Bentler 1999). Sometimes, more tolerant cut-off of such as less than .10 is used (Henseler, Dijkstra et al. 2014). SmartPLS documentation states, "*When all your measurement models are reflective, and PLS has been used, then, the common factor model SRMR is the relevant model fit assessment criterion*". SmartPLS also provides bootstrap-based inference statistics of the SRMR criterion.

Exact Model Fit Tests: These tests are based on the statistical inference of the difference between the empirical covariance matrix and the covariance matrix implied by the composite factor model. As defined by Dijkstra and Henseler (2015), d_LS (i.e., the squared Euclidean distance) and d_G (i.e., the geodesic distance) represent two different ways to compute this discrepancy. Bootstrapping provides the confidence intervals of these discrepancy values. A model is considered to fit well if the difference between the correlation matrix implied by the propoased model and the empirical correlation matrix is non-significant ($p > 0.05$). Otherwise, if the discrepancy is significant ($p < 0.05$), model fit has not been established.

4.7.7 Assessment of Moderation Effects

Baron and Kenny's (1986: 1174) defined a moderator as a ". . . *variable that affects the direction and/or strength of the relation between an independent variable and a dependent variable*". Questions involving moderators address "when" or "for whom" a variable most strongly predicts or causes an outcome variable. Testing moderation effects in SEM is recognized as an important step that make the analysis more relevant (Vinzi, Chin et al. 2010) and indicates the maturity and sophistication of a field of inquiry (Judd, McClelland et al. 1995, Aguinis, Boik et al. 2001). Most of the recommendations for testing moderating effects in multiple regression hold for PLS path modelling as well (Vinzi, Chin et al. 2010).

The tests of moderation effects in the model, also account for the control variables. A control variable is a variable that has an impact, typically over the dependent variable that cannot be ignored. However, its theoretical background is not explored as a part of the present study. Therefore, the model merely accounts for its effect by directly connecting it to the dependent variable in order to control its effect. The results for control variables are usually not further interpreted (Hair, Ringle et al. 2013). When the effect of control variables is significant, the researcher should use this finding carefully when drawing conclusions or initiating additional analyses such as multigroup analyses (Sarstedt, Henseler et al. 2011). However, when an external variable's effect is theoretically supported, its impact on the model can be systematically investigated as a part of the study.

According to Garson (2016), adding a moderator to the model may cause the path from an independent construct to dependent construct behave differently. When the moderator is present, the original effect may remain the same (no effect), drop to 0 (complete control), drop part way to 0 (partial control), or increase (suppression). **I**f two variables share a mutual cause, they usually are correlated but this effect may be spurious. Therefore, if the original correlation disappeared when the moderator (mutual cause) was added to the model, it could be gathered that the originally observed effect was false. A suppression effect occurs when the moderator is positively related to the predictor and negatively related to the dependent variable. In

such a situation, the original correlation in the model will be lower than when moderator is added to the model.

4.7.7.1 Approaches

There are multiple approaches for testing the moderation effects in SEM. In general, the **product term approach** and the **group comparison approach** can be used to estimate the moderating effects both of which can be tested using SmartPLS. In the group comparisons, the researcher is interested in whether certain path coefficients differ across groups. In the product term approach, the interaction effects among independent variables are checked (Chin, Marcolin et al. 2003). Moderator variables can either be scaled or categorical in nature. While scaled, moderators are usually analysed through interaction effects, when the moderator variable is categorical, it can be used as a grouping variable in a multi group analysis (Vinzi, Chin et al. 2010). James and Brett (1984) suggest that if a moderator variable is continuous, it be rescaled as discrete. Bagozzi, Baumgartner, and Yi (1992), however, argue that when variables are measured as continuous it is preferable to model moderated variable effects as interactions to retain the full information.

Henseler and Fassott (2010) presented a framework for determining moderating effects in PLS path models. They presented several procedures to test moderating effects by means of PLS and stated that the selection of procedures should be based on the model specification as well as the type of data available. In general, they recommend choosing the product term approach over group comparisons within PLS path models, given that the results of the product term approach are usually equal or superior to the group comparison approach due to several reasons. Firstly, due to the dichotomization, a part of the moderator variable's variance is lost for analysis. Secondly, observations that cannot be clearly allocated to a group are ignored from analysis. Thirdly, the assignment of observations to groups is somewhat arbitrary. However, despite these drawbacks, the group comparison approach is quite popular, probably due to ease of use. Henseler and Fassott (2010) suggest using group comparisons if the researcher wants a **quick overview** of a possible moderator effect. In this research both the interaction terms and group comparison approaches are used.

Henseler and Chin (2010) compare and contrast between four different approaches used to analyse interaction effects in PLS by means of an extensive Monte Carlo experiment. Their results indicate that both the product indicator approach (Chin, Marcolin et al. 2003) and orthogonalizing approach (Little, Bovaird et al. 2006) provide a significantly and substantially more accurate prediction than other approaches such as hybrid approach (Wold, 1982) and 2-stage approach (Chin, Marcolin et al. 2003). They recommend choosing either the product indicator or the orthogonalizing approach, if a researcher wants to achieve precise prediction, when fewer indicators and fewer observations are available. In contrast, Hair et al. (2014 : 265) recommend the product indicator method when the research purpose is hypotheses testing but recommend the Latent Variable Score approach when the purpose is **prediction**.

Interpreting Moderation Results: Two things should be done when interpreting the results of moderation analysis. Firstly, it has to be determined whether there is a significant moderating effect in the population, Secondly, the strength of moderation effect in PLS path models should be determined. In moderator analysis in the PLS path models, the researcher should initially estimate the main effects in the PLS path model without adding the moderator. In the next step, moderator can be included. For example, in interaction tests, the model is tested twice, before and after adding the product term. This is done in order to avoid the common mistake of confounding main and simple effects (Henseler and Chin 2010, Henseler and Fassott 2010, Hair, Ringle et al. 2013). When there is theoretical support for multiple moderators, one may consider analysing one moderator at a time to maintain interpretability of all results (Hair, Ringle et al. 2013).

a) Interaction Terms (Product Terms)

Tests of continuous moderator variable effects can be performed by specifying interaction effects within the structural equation model context (Sauer and Dick 1993). An interaction term is an exogenous moderator which affects an endogenous variable by way of joint relation with another exogenous variable. Moderator may also have a

direct effect on the endogenous target variable. There are two popular methods for modelling such a hypothesized interaction.

- **Product Term Approach** (Chin, Marcolin et al. 2003): In this approach, a new latent variable (LV) is added to the model whose indicators are the products of all indicators of the independent construct and the moderator. This approach can be used when the moderator variable is simply an observed variable or a latent construct. The product indicator method may only be used for reflective models. If there is an interaction effect beyond the separate linear effects of independent construct and moderator, then the path from the product to dependent construct will be significant.
- **Latent Variable Score (LVS) Approach** (Chin, Marcolin et al. 2003): Another popular approach to modelling interactions is the LVS (also known as two-staged approach). Unlike the product indicator approach, this can be used when exogenous variables are formative or reflective. This approach has two stages. In the first stage, independent constructs and the moderator are modelled as exogenous causes of the endogenous variable and LV scores are created for all factors in the model. In the second stage, all LVs are modelled with a single indicator, which is their LV score previous stage. Since LVs are now equal to their indicators, they can be modelled reflectively or formatively. Also, a new LV is created whose single indicator is the product of the stage 1 LV scores for the independent construct and its moderator. If there is an interaction effect, its path to the exogenous construct will be significant in the stage 2 run of the model.

Determining Significance and Strength of Moderation Effect: To determine whether there is a significant moderating effect, a test has to be done whether the path coefficient capturing the moderating effect differs significantly from zero. To determine the significance of moderation effect in PLS path models, **bootstrapping** is recommended (Chin 2010). The hypotheses on the moderating effect is supported if the path coefficient from interaction term to endogenous variable is significant regardless of the values of direct effects from exogenous variable and moderator variable (Baron and Kenny 1986 : 1174). Secondly, the strength of the identified

moderating effect has to be assessed. According to Henseler and Fassott (2010), strength of moderator effects can be identified in several ways;

- In the case of standardized variables, if the moderator variable is 1, the exogenous variable's influence on the endogenous variable is x + y (x = path coefficient from independent variable to dependent variable, y = path coefficient of the interaction term).
- The moderating effect can also be assessed by comparing the proportion of variance explained (as expressed by R2) of the main effect model (without moderator) with the R2 of the full model (including the moderator).
- According to Cohen (1988, p. 410–414), the effect size f 2 can be calculated as: f 2 = (R2 model with moderator - R2 model without moderator) / 1- R2 model with moderator. Moderating effects with effect sizes f 2 of 0.02 may be regarded as weak, effect sizes from 0.15 as moderate, and effect sizes above 0.35 as strong (Henseler and Fassott 2010). Chin et al. (Chin, Marcolin et al. 2003) state that a low effect size does not necessarily imply that the underlying moderator effect is negligible:

b) Group Comparisons (Multi Group Analysis)

Many variables which have the potential for use as moderators are not continuous (e.g., gender or occupation). Multi-group comparisons are a special form of moderation that allows to test the effect of discrete moderator by utilizing the moderator to divide the sample into groups and identifying the difference between structural parameters across groups. The use of multi-group comparisons is to determine if relationships hypothesized in a model will differ based on the value of the moderator. In this research, a multi-group analysis would answer questions such as: '*Does social capital effect collaboration differently when the ICT capability is high or low?*'

In order to use multi-group moderation, moderator variables which are at least ordinally scaled need to be made discrete by using theoretically appealing cut-points (James and Brett 1984, Baron and Kenny 1986) resulting in two value categories,

"high" and "low". There are several **ways to dichotomize a latent construct** (Henseler and Fassott 2010).

- 'Median split' is a frequently used method for grouping into categories. Observations above the median, are considered a high value whereas those below the median, are said to have a low moderator value.
- For reflective latent constructs, if all indicators' values are above the mean, the grouping value is "high". If all indicator values are below the mean, the grouping value is "low". Otherwise, the observation is not assigned to any group.
- For formative latent constructs with indicators that do not necessarily correlate and with no interpretable mean, a different rule is applied. If the moderator's LV score of an observation is in the upper third, the observation is grouped as "high" where if the moderator's latent score of an observation is in the lower third, it is grouped as "low". Otherwise, the observation is not assigned to any group.

Once the observations are grouped, the model with the direct effects is estimated separately for each group of observations. There are three methods of **testing the significance of path differences in group comparisons** (Sarstedt, Henseler et al. 2011, Hair, Sarstedt et al. 2014 : 247-255). SmartPLS supports these three approaches that are by providing required bootstrapping results from every group.

- **PLS-MGA:** Chin and Dibben (2010) present a permutation-based approach that provides the possibility to test for different path coefficients among groups. This **non-parametric** significance test finds a difference to be significant if the p-value is smaller than 0.05 or larger than 0.95 for the difference of group-specific path coefficients. This method is the most commonly used test which is an extension of the original non-parametric Henseler's MGA method (Henseler 2007, Henseler, Ringle et al. 2009, Henseler 2012) as described by Sarstedt et al., 2011.
- **Parametric Test:** This **method** assumes that groups have equal variances. Parametric multigroup analysis uses independent samples t-tests to compare paths between groups, as proposed by Keil et al. (2000). As the PLS solution does not follow a known distribution, bootstrapped significance is the available

option. Overall, this approach works reasonably well if the two samples are not too non-normal and/or the two variances are not too different (Chin 2000).

- **Welch-Satterthwait Test:** This is an alternative parametric test, assuming unequal variances between groups.

The criteria available for testing moderating effects in PLS path models discussed above is summarized in the table 4.7 given below.

Table 4.7 : Assessment Criteria for Moderation Effects

Type	Authors	Criteria
Group Comparison **PLS-MGA**	Chin and Dibben (2010)	Group difference is significant if the significance (p-value) is smaller than 0.05 or larger than 0.95 for the difference of group-specific path coefficients.
Interaction Terms	Baron and Kenny (1986), Chin et al. (2003)	**Significance of moderation effect** Moderating effect is significant if the path coefficient from interaction term to endogenous variable is significant regardless of the values of direct effects from exogenous variable and the moderator.
	Henseler and Fassott (2010), Chin et al. (2003)	**Strength of moderation effect** • R2 of the main effect model (without moderator) with the R2 of the full model (including the moderator) is different. • Moderating effects with effect sizes f^2 of 0.02 may be regarded as weak, from 0.15 as moderate, and above 0.35 as strong. Effect size can be calculated as f^2 = (R^2 model with moderator - R^2 model without moderator) / 1- R^2 model with moderator. Cohen (1988, p. 410–414). • In standardized variables, if the moderator variable is 1, the exogenous variable's influence on the endogenous variable is x + y (x = path coefficient from independent variable to dependent variable, y = path coefficient of the interaction term) • Path coefficient capturing the moderating effect differs significantly from zero.

4.8 Ethical Considerations

This research is categorized as a 'negligible or low risk' research according to the NHMRC *National Statement on Ethical Conduct in Human Research.* The procedures for collecting data and maintaining the collected data for this research is approved by the Human Resource Ethics Committee – HREC of Curtin University. See the References section to access a copy of the NHMRC. Following the guidelines provided by NHMRC, an **information sheet** is developed to be provided to the potential participants of the survey in advance. The information sheet explains the objective of the research, methods of data collection and contact information of the researcher.

Participation in the survey by bank managers is voluntary. No personal data is requested from the respondents; thus, the anonymity of the respondents is maintained. The participants' consent is therefore assumed, if the respondent submits the completed survey instrument back to the researcher through manual or online form.

Participants of the main survey are the senior management staff in the higher management, in the banks in Sri-Lanka. There are 34 licensed banks and 48 finance institutions in Sri-Lanka. Potential participants are identified with the help of higher management and through contacts. There is no dependent relationship between the researchers and the respondents.

In this study, data was obtained from direct wources in addition to the survey. This included a obtaining a dataset from a clearing agency on inter-bank transactions based on a Non Disclosure Agreement between the University, researcher and the agency. The identification of banks is only used for integrating this data with the rest of the data and thereafter identification is removed from data set and it is only stored in researchers computer and supervisors computer witn encryption. Also, bank-wise data on syndication loan participation was obtained from banks on request on their consent. Sensitive finance information such as the amounts of loans was not requested or collected in order to avoid ethical issues and, non-responses bias. Further, the loan amounts were considered irrelevant as the amounts largely depend on banks' capacity.

Non-sensitive data such as the **year of each loan** and its **participant banks** were obtained from banks.

Data Storage: The data collected from the respondents is stored in digital form where only the researcher and the supervisor have the access to data throughout the research and regular back-ups will be taken. A copy of data will be stored on the Curtin Computer Network. Interview records and completed questionnaires will be kept encrypted and destroyed at the conclusion of the study. All recorded data will be maintained electronically for a minimum period of five years at the School of Information Systems according to the guidelines of National Health and Medical Research Council 2007.

4.9 Summary

This chapter explained the method through which this research approach its objectives. The chapter explained the research strategy adopted in this research and the associated steps. A quantitative research strategy with certain exploratory features is followed in this research. The chapter also discussed the appropriateness of such a strategy in this research. The chapter further explained how the research instrument is designed, data is collected and how the data is analysed in this research using the technique of Partial Least Squares based Structured Equation Modelling (PLS-SEM). Furthermore, the steps taken to improve the reliability and the validity of the research were discussed in this chapter. A detailed description of the process of PLS-SEM and the accepted criteria for the assessment of model validity is also presented in the section 4.7 including summary tables to enable future references in this thesis. Finally, the ethical considerations associated with this study have been discussed.

Chapter 5

PRELIMINARY DATA ANALYSES

5.1 Introduction

In quantitative research, the collected data need to go through screening and pre-tests before they are used to examine the validity of the proposed hypotheses. The process through which the collected data are cleaned, addressing certain issues with data that might mislead the data analysis is known as 'Data Screening' (Tabachnick and Fidell 2007, Hair, Anderson et al. 2010, Meyers, Gamst et al. 2013). Data screening involves identifying any missing data values and extreme data values which might adversely affect understanding the phenomenon attempted to be explained (Tabachnick and Fidell 2007, Meyers, Gamst et al. 2013). Data screening also involves examining whether the collected data meet the assumptions of SEM analysis techniques. The process of preliminary analysis carried out in this research is given in the following figure.

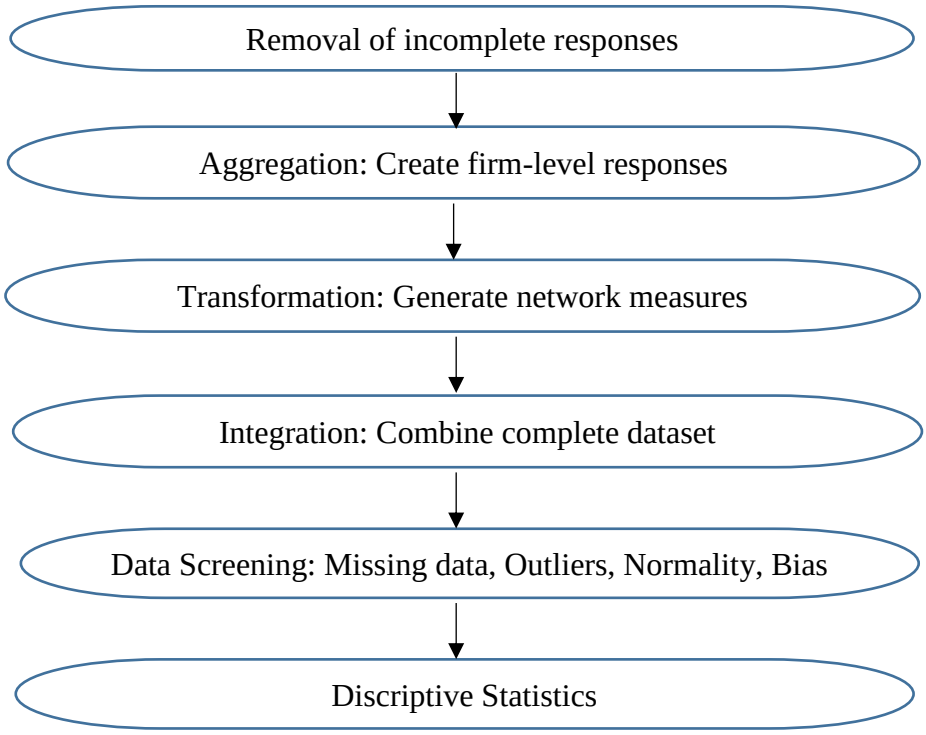

Figure 5.1 : Process of Preliminary Data Analysis

In this study, the collected data needed to go through pre-processing stages prior to the above mentioned standard procedures before the data was ready to be used for the intended forms of analysis. Among the multiple responses that are among the remaining responses from each banking firm, there were responses that are largely incomplete where the respondents have only answered the preliminary questions designed for descriptive statistics but did not answer the rest of the questionnaire or responses with a majority of unanswered questions. Such records were completely removed these responses from the data set in the first stage. The proposed theory in this study is framed at the level of the firm. As such, it is necessary to aggregate the responses from multiple individuals into a single, firm-level measure for each item. Also, it is necessary to convert data into suitable formats for the intended analysis. As this study intends to investigate the use of network measures, the aggregated data needs to go through several steps to be transformed into network locational measures. The network measures and the other non-relational measures should be then integrated in to a complete data set. The integrated dataset will be screened for missing values, outliers and normality. After the screening, data is summarized to obtain an overall understanding about the collected data and samples selected. Preliminary analysis also involve obtaining additional descriptive observations about the data (Buchner and Findley 1991: 154). Such a process is important to obtain a "*general 'feel' of the data*" (Chatfield and Collins 1980).

The section 5.2 discusses issues related to data aggregation, conversions and integration. The section 5.3 explain the data screening process including how data screening and preliminary data analysis are done in the research concerned. It explains how issues with data are identified, and what steps are taken to minimize effects of those data on data analysis and drawing conclusions. The sections 5.4 and 5.5 present an overview of the collected data and the section 5.6 summarizes how the research addresses the concern of common method bias.

5.2 Data Aggregations, Conversion and Integration

As per the description of the survey, most of the variables used for this study were relational and were measured at the dyadic level and the data was collected from several top-level managers in each bank. The theory proposed in this study and hypotheses were framed at the level of organizations. Therefore, it was necessary to aggregate data into single firm-level measures. Afterwards, the relational data needed to be transformed to derive locational properties and certain conversions were carried out to integrate these data into one data set ready for the analysis. This approach was adopted from many earlier studies that have used a similar research design (e.g. Ibarra 1993, Powell, Koput et al. 1996, Tsai and Ghoshal 1998). The following sections explain the steps taken to handle the potential issues with data.

5.2.1 Aggregation of Responses

First, the aggregation of the multiple responses from each bank into a firm-level measure for each of the constructs was carried out. As indicated in the description of the survey, for each relational measure, each respondent had to pick, out of the 34 banks listed in the survey, the banks with which his or her bank enjoyed that specific relationship. At this stage, the number of remaining responses per-firm varied from 3-6. However, it is not possible to establish the appropriateness of such aggregation using standard tests of interrater convergence (Tsai and Ghoshal 1998) with relational measures. Instead, the convergence indexing method followed by Tsai and Ghoshal (1998) was used to check the extent of consistency in the responses from each firm before aggregating them.

To check the extent of consistency in the responses from each firm, convergence indexes were computed. Tsai and Ghoshal (1998) stated;

"…*The index was defined as Ckx = Akx/Bkx, where Ckx is the index of consistency for measure k for unit x, A, is the number of units selected by at least two of the three respondents of unit x for measure k, and Bkx is the number of units selected by at least*

one of the three respondents of unit x for measure k. Note that the value of Ckx can range from 0.0 (perfect inconsistency) to 1.0 (perfect consistency)."

Following the above approach, the convergence index for this study was defined as Ckx = Akx/Bkx, where Ckx is the index of consistency for measure k for firm x, A, is the number of organizations selected by at least 66.66% of the respondents of firm x for measure k, and Bkx is the number of organizations selected by at least 33.33% of the respondents of firm x for measure k. The value of Ckx can range from 0.0 (perfect inconsistency) to 1.0 (perfect consistency). In this study, the value of C, varied from 0.5 to 1.0, across all relational measures.

Once the consistency was established, the average of multiple responses was computed by simply calculating the mean in order to obtain a single firm-level. For example, the firm-level opinion of which other organizations are trusted can be obtained through the aggregation of multiple responses within the firm. In this process, the available number of responses from an organization was used to compute the average. The aggregation of responses for each bank was carried out considering one item (survey question) at a time. This is also known as the 'Unweighted mean' approach in previous literature (Kumar, Stern et al. 1993).

5.2.2 Transformation (Derive Network Measures)

The aggregated relational data are then recorded in the socio-metrics form (firm x firm matrix). Matrixes were created for each relational item measuring some aspect of the model (e.g. an item is one question such as '*what banks do you trust?*'). These data matrixes were entered into a network analytic tool named Organizational Risk Analyzer - ORA (Carley, 2004) and a meta-network was created including different layers of networks among organizations. Locational properties of individual organizations were generated. In adopting this approach, we followed many earlier studies that have used a similar research design to considerable advantage (Tsai and Ghoshal 1998). In order to obtain locational properties of individual organizations, '*All Measures Report*' was generated through ORA. This report includes a set of network measures that result in a value per each firm for each network measure. Out of these

measures, the appropriate parameters reflecting different locational properties were selected to be included in the data set. Different network measures used for this study are discussed in the Chapter 2 – Section 2.3.5. in detail (e.g. 'in-degree centrality' or 'betweenness').

For the **structural dimension of social capital**, the inter-organizational social links were measured through both survey items and objective data. Survey items were used to measure firm-level social interactions '***Participation in inter-organizational social events****'* and '***Frequency of inter-organizational social interactions***'. The survey question measuring firm-level participation in social events is; '*Does your bank take part in any of the following common events or groups that may allow the staff of your bank to blend with the staff of other banks? Please tick all choices that apply*.' A list of social events or groups that exist in the inter-bank domain was provided. Similarly, the 'frequency of inter-organizational social interactions' was measured using '*How often does your bank socially interact with other banks in general? (daily, weekly, monthly, annually, more)*'. Top managers' external social ties were objectively identified from public profiles in bank web sites (Positions held in Industry associations and Memberships in Professional associations). Representations of each bank's directors in the well-known associations in the banking industry in Sri Lanka was identified. Similarly, representations of each bank's directors in 18 professional bodies related to banking in Sri Lanka identified.

Following Tsai and Ghoshal (Tsai and Ghoshal 1998), 'socio-matrices' were constructed for '*Participation in different inter-organizational social events*' and '*Frequency of inter-organizational social interactions*' for which the data was collected from the survey. For example, all the data collected for the first question was summarized in a single matrix linking banks and social events. Also, another set of 'socio-matrices' (bank x association) were constructed among banks through links of top executives: Professional network and Industry network and transformed them into a Bank X Bank matrices using the network analysis tool named 'ORA'. These new networks between banks were used to generate per-bank centrality measures. The study further explores the predictability of alternative locational measures (e.g. betweenness centrality, effective network size) representing the different structural

aspects (e.g. brokerage, cohesion) in the inter-bank context. The identification of relevant network measures for each construct in the model have been discussed in the Chapter 3.3.3. The results of predictability for various parameters are given in the Chapter 7.

For the **relational dimension of social capital**, four survey questions were used to measure 'Trust' between banks: '***Non-opportunistic behaviour***' ("*Please select the banks that you can rely on without any fear that they will take advantage of you or your bank even if the opportunity arises*"), '***Reputation based trust***' ("*Please select the banks with a good industry reputation so that you would be willing to trust this bank to get a job done properly even without your monitoring*") and '***Promise keeping***' ("*This bank has always kept the promises they made during the past and fulfilled their responsibility in agreements. We can rely on this bank to abide by any future*"). For each item, relational matrices were created measuring inter-organizational trust. The networks were created in ORA and same procedure was used to generate network parameters. The in-degree centrality for each firm is calculated as a derived indicator of 'trustworthiness' of a firm.

For the **cognitive dimension of social capital**, two survey items were used to assess the level of shared cognition of a bank with other banks: '***Shared Vision'*** ("*Please select other banks that share the same vision and ambitions as your bank*.") and '***Shared Work Understandings'*** ("*Please indicate the banks that your bank shares a good understanding through shared norms and easier to work with*."). A third item, '***Shared market knowledge***' was measured through the data available in websites. Bank X Bank matrices were constructed and the mutually confirmed ties from both parties were identified to verified to confirm the existence of mutual understanding between organizations. The firm-level locational properties were identified via the network analysis tool named 'ORA'. The closeness centrality measure is used as a derived measure of node level extent of the 'shared understandings' with other organizations. In the context of this study, closeness centrality is used to denote the overall cognitive proximity of an organization to other organizations.

Inter-Organizational Collaboration (Alliances): Inter-bank collaboration is measured through a survey question ('*Please select the banks that you have engaged with in syndication relationships during the last 3 years'*) by directly requesting each bank to provide a list of syndication loans participated in the past three years with the 'year' of loan and 'participant banks' of each loan. The mutually confirmed ties from both parties were identified and corroborated to derive '***the number of distinct partners***', '***number of alliances***' and '***number of alliance leaderships***' for each bank as the indicators of dependent construct. The bank x loan matrix was created and transposed into bank x bank matrix. As an additional measure, the firm-level centrality measures were generated through ORA.

ICT capability level was measured using a set of indicators that was identified in the banking domain in the Sri Lankan context. The list of representative technologies included; '***ICT-based communication tools, ICT-based banking services, ICT-based social media, participation in ICT-based inter-bank systems, ICT infrastructure capability, ICT human resources capability***'. They were recorded in a bank x ICTs matric. In the cases of multiple survey responses from a firm, the majority's response was considered as the firm-level response of whether a certain technology is available in-house or not. The survey questions specific to ICTs were in a separate section and was only given to the management of ICT in banks to ensure accuracy and consistency. The overall ICT capability and different firm-level centrality measures were derived from this data.

5.2.3 Integration

In this research, data was collected through a survey as well as from public sources such as web sites of the banks and published annual reports. The data collected through the public sources included both relational data such as the number of directors having links with which other banks and per-bank attributes such as the starting year of the bank and its total assets. Both the subjective and objective relational data was used to generate network measures as discussed above. These data could then be combined with data on nonrelational measures in a traditional statistical analysis. This approach was followed in many earlier studies that have used a similar research design to

considerable advantage (e.g. Ibarra 1993, Powell, Koput et al. 1996). Table. 5.1 presents a summary of pre-processing needed for different categories of data used in this study.

Table 5.1 : Summary of Pre-processing for Different Categories of Data

	Survey Data	**Data from Direct Sources**
Relational Measures (Network Locational Properties)	Multiple responses from each firm are aggregated. Relational data are transformed into network measures. Missing data are not present. e.g.: which banks do you trust?	Objectively identified relational data are transformed into network measures. Missing data are not present. e.g. links of directors identified through public profiles
Non-Relational Measures (Regular variables)	Multiple responses from each firm are aggregated. There may be missing values if none of the respondents answer the relevant question. e.g. does your bank engage in inter-bank sports?	Objectively identified non-relational data can be directly used. There may be missing values if it was not possible to find the piece of data from secondary sources. e.g. the start year of the firm, number of branches etc.

The per-bank network measures (such as: the centrality of a bank in the inter-bank social network of directors) obtained from ORA are then integrated with other measures. The other measures include the non-relational versions of the same measurement items (e.g. number of directors having links with other banks or number of banks liked through directors) and the secondary data about individual organizations (age, number of staff, number of branches, ICT capability etc.). As such, a complete data set is composed where each row represents an organization including both the network locational properties and non-relational data.

As a result, there are four types of variables in the data set used for this research. First, majority of the network locational properties of organizations were identified through the data obtained from survey (subjective network measures). Second, certain network locational properties of organizations were identified through the data obtained from secondary sources (objective network measures). Third, some of the non-relational

variables were identified through survey (subjective non-relational measures). Fourth, other non-relational variables were identified from secondary sources such as websites or annual reports (objective non-relational measures).

5.3 Data Screening

Once the complete data set is available after integration of network measures (locational properties of organizations) and non-network variables, the data set is subjected to standard data screening tests as described in the following sections before it is ready to be used for analysis.

5.3.1 Handling Missing Data

The collected data may involve 'missing data' due to the errors in data-entering, errors in data-collection or simply due to the omissions made by the respondents (Hair, Anderson et al. 2010). Missing data values might severely affect the validity and the reliability of the research findings depending on the amount of missing data values and their patterns (Tabachnick and Fidell 2007). When there is a large when the amount of missing data or when the missing data values are not randomly distributed across the dataset it will cause problems in the analysis (Tabachnick and Fidell 2007).

As described earlier, four types of variables are present in the data set used in this study. Since the relational measures were computed through network analysis, where each firm is modelled as node in the network, each firm is given a value pertaining to its location in the network. Therefore, in relational measures, missing values are not present. In this study, a few missing values were present in the non-relational variables. However, there was no observable pattern in the un-answered questions. Therefore, it such omissions are accountable to random mistakes. In this study, missing data for an individual response does not exceed 10%. When missing data values does not exceed 10% for individual responses and when there is no observable pattern, imputing the missing data values is commonly used (Tabachnick and Fidell 2007, Hair, Anderson et al. 2010, Kline 2015).

Statistical software such as SPSS (Statistical Package for Social Sciences) can be used to impute missing data values in data samples (Tabachnick and Fidell 2007). For this research, we used SPSS 22.0 to impute the few missing data values in the non-relational data through maximum likelihood estimation technique. The above technique is a widely-used technique for imputing missing values that appear at random (Tabachnick and Fidell 2007, Hair, Anderson et al. 2010).

5.3.2 Handling Outliers

Another type of issue that need to be handled is the presence of 'outliers' in the data. An outlier is "*an observation that is significantly different from the other observations on one or more characteristics*" (Hair, Anderson et al. 2010). Outliers can be either univariate or multivariate. While a univariate outlier is, an extreme value observed for a single variable in a dataset (Kline, 2004; Tabachnick & Fidell, 2007), a multivariate outlier is a response with extreme data values for two or more variables (Kline, 2004). Outliers may be present in datasets due to data entry errors or due to the presence of cases that do not actually belong to the intended population (Tabachnick and Fidell 2007, Hair, Anderson et al. 2010). The outliers may also represent a true data point. The presence of outliers affect the normality of data distributions and may mislead SEM data analysis (Byrne 2010).

There are several ways to handle outliers in a variable. While the severe outliers must be addressed, moderate outliers having a smaller impact on the model, could be retained (Chin 2010). The trimming and winsorising could be used to handle serious outliers (Kettaneh, Berglund et al. 2005). Trimming and winsorising involve the separate sorting of each variable and removing or modifying a small percentage of the extreme values (typically between 1 and 5%). It is also reasonable to analyse whether they can be regarded as acceptable cases (Urbach 2010). If it's possible that the outlier has occurred due to some error in measurement, then it could be trimmed. With trimming, the extreme elements are simply set to 'missing' introducing between 2% and 10% of missing values in the data. If there is reason to believe that the outlier is an acceptable data point (not a mistake), winsorising could be used, where the extreme

elements are replaced with values closer to the mean, e.g.3 standard deviations (computed in a robust way) or the 'last good value' with process data.

Graphical techniques such as histograms or boxplots could be used to identify univariate outliers through visualizing the distribution of data for each variable using statistical tools such as SPSS (Tabachnick and Fidell 2007). The outliers could either be removed or retained (Tabachnick and Fidell 2007, Hair, Anderson et al. 2010). Multivariate outliers could be identified based on the Mahalanobis distance using statistical software. The Mahalanobis distance "*is the distance of a case from the centroid of the remaining cases where the centroid is the point created at the intersection of the means of all the variables*" (Tabachnick & Fidell, 2007, p. 74).

In this research, a very few, univariate, moderate outliers were identified using box plots (Tabachnick and Fidell 2007). Outliers were detected in both relational measures (network locational properties) and non-relational variables (secondary data). The detected outliers are considered reasonable in this study and were retained. Also, this research uses PLS-SEM which is a non-parametric technique, it does not impose distributional assumptions (Hair, Sarstedt et al. 2014). Therefore, the impact of outliers in the analysis is considered minimum.

5.3.3 Handling Non-Normality

Mainstream of SEM techniques assume the multivariate normality of data distributions (Tabachnick & Fidell, 2007). The non-normally distributed data would cause problems for SEM techniques in fitting the hypothesised model with the given data (Byrne 2010). This research uses PLS SEM technique for data analysis which is a recommended SEM approach for non-normal data (Hair, Sarstedt et al. 2014). Both theoretical discussions (Beebe et al. 1998) and simulation studies (Cassel, Hackl et al. 1999) indicate that the PLS-SEM algorithm transforms non-normal data in accordance with the central limit theorem (see also Dijkstra 2010). These studies show that PLS-SEM results are robust if data are highly skewed (Henseler, Ringle et al. 2009). Therefore, non-normality of data has a lesser impact in this study compared to the studies using traditional SEM techniques.

The normality of data distributions could be analysed using a graphical analysis and statistical tests. In this study, the data is evaluated using the Kolmogorov Smimov test using SPSS (George 2011). This test computes the level of significance for the nonconformity of a distribution from the normal distribution (Hair, Anderson et al. 2010, George 2011). A significance value close to zero indicates the non-normality of the data distribution (George 2011). The test results in this study indicate that the data distributions are non-normal. Therefore, bootstrapping with SmartPLS 3.0 is used to handle the non-normality of the data distributions. Bootstrapping is often used as a remedy for the non-normality of distributions of the collected data, when data is analysed using SEM (Byrne 2010). The use of PLS for the estimation also minimalize the impact of non-normality of data in the analysis and outcomes.

5.3.4 Test for Common Method Bias

The common method variance refers to the "*variance that is attributable to the measurement method rather than to the constructs the measures represent*" (Podsakoff, MacKenzie et al. 2003: 879). Such variances caused by the measurement method are problematic since they can cause measurement errors (Podsakoff, MacKenzie et al. 2003). Literature identify a number of causes for the common method bias. These include, ambiguities in questionnaire, difficulty of questions, lack of cognitive ability of participants (MacKenzie and Podsakoff 2012), fear of identification (Podsakoff, MacKenzie et al. 2003), hints on how to respond (Podsakoff, MacKenzie et al. 2003). In this research, both procedural and statistical remedies are occupied to address potential concerns for common method bias (Krishnan, Martin et al. 2006). The preventative steps used during the survey instrument development are discussed in Chapter 3 of this thesis.

There is an increasing debate as to how serious this bias is (Bagozzi 2011). Therefore, several tests were done in this study to identify any indication of common method bias. There are few methods to test CMB which include Harman Method, Lindell & Whitney Method and easier but more general approach of Bagozzi et al. Method (Bagozzi, Yi et al. 1991). The Harman's single-factor test is used to statistically

examine whether the common method bias exists (Aulakh and Gencturk 2000, Podsakoff, MacKenzie et al. 2003, Krishnan, Martin et al. 2006). The test was conducted using SPSS statistical package. The test examines whether the majority of the variance in the model could be explained by a single factor. In the measurement model, the most variance that could be explained by a single factor is found to be 43.1%. These results indicate that the common method bias is less likely (Li, Chau et al. 2010).

Due to the disagreement about the merits of Harman's single-factor test (Podsakoff, MacKenzie et al. 2003) the results were supported by additional tests as recommended by Lawry and Gaskin (2014). A confirmatory factor analysis (CFA) was performed by modelling all items as the indicators of a single factor, and the results show a poor fitness. Method biases are assumed to be substantial if the hypothesized model fits the data (Malhotra, Kim et al. 2006). Thus, the results of both tests indicate that common method bias is not a significant problem for the current study. Kock, N. (2015) presents a practical approach to test common method bias in PLS-SEM based on variance inflation factors generated via a full collinearity test. They demonstrate that the full collinearity test is successful in the identification of common method bias with a model that nevertheless passes standard convergent and discriminant validity assessment criteria based on a confirmation factor analysis. Through this procedure, variance inflation factors (VIFs) are generated for all Latent Variables (LVs) in a model. A VIF greater than 3.3 is proposed as an indication of extreme collinearity, and an indication that a model may be contaminated by common method bias. In this study, variance inflation factors (VIFs) are generated for all LVs in the model using SmartPLS during the analysis stage. As all VIFs are lower than 3.3, the model can be considered free of common method bias. More advanced approaches also can be applied to test common methods bias. A leading approach with PLS is to include a marker variable in the data collection that is unrelated to the model (Lindell and Whitney 2001). If the correlations of the data to the marker variable are high, common methods bias likely exists.

5.3.5 Test for Sample Size Adequacy

It is important to establish the adequacy of the sample size used in this study before the PLS-SEM analysis. The theory proposed in this study is framed at the level of the organizations. Therefore, the sample size is in this study is limited to 34 although the study covers the entire population of organizations. According to Barclay et al. (1995) and Chin (1998)(1998b), "*the sample size depends on the number of predictors that are involved in the multiple regressions in the inside and outside approximation. Consequently, researchers should (a) identify the block with the largest number of formative indicators and count them, (b) identify the Latent Variable (LV) with the largest number of independent LVs and count them, and (c) take the maximum of both figures and multiply this by ten to obtain the minimum sample size*" (Barclay, Higgins et al. 1995, Chin 1998). According to Hair at el, (2014), "*PLS-SEM minimum sample size should be equal to the larger of the following: (1) ten times the largest number of formative indicators used to measure one construct or (2) ten times the largest number of structural paths directed at a particular latent construct in the structural model*". Following the above criterion, the conceptual model in this study was assessed. Firstly, there are no formative constructs in the conceptual model. Therefore, the largest number of formative indicators per construct is zero, which satisfies the first rule. Secondly, the largest number of paths directed to one latent construct in the model is 3. When multiplied by 10, the minimum sample size requirement should be 30, which is less than the actual sample used in this study (34 organizations). Therefore, both of the above rules are satisfied in this study indicating an adequate sample size.

5.4 Characteristics of the Sample

This section summarizes general characteristics of respondents and the firm-wise cases used in this research using tables and graphs. The characteristics of the respondents of this research are presented in terms of their banking experience in number of years, domain of speciality, academic qualifications and professional memberships. The characteristics of the sample at the level of organizations include ownership category and domain. Such summaries are useful for understanding the characteristics of respondents in general.

5.4.1 Distribution of Respondents' Characteristics

The respondents of this survey were senior managers in banking organizations currently operating in Sri Lanka. Figure 5.2 shows the distributions of experience of the respondents of the survey. The majority of the respondents had more than 25 years of experience in the banking industry. Among a total of 159 respondents, 37 belong to the above group which is 25 % of the total. Next, 17 % of respondents had more than 20 years of experience. Another 35% had 15 years of experience in banking. The remaining 23 % also had more than 10 years of experience. This information shows that all the respondents in this survey had at least 10 years of experience in the banking domain. There is no significant difference between the respondents in term of experience in the banking domain.

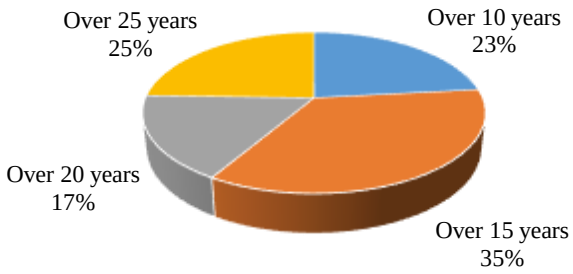

Figure 5.2 : Distribution of Respondents' Experience in Banking

Figure 5.3 shows the distributions of the respondents' domain of speciality in banking sector. An examination of the fields of the speciality of the respondents reveals that the respondents to the survey belong to five fields. While 16 % of the respondents are managers from general banking operations, a 21 % of respondents were from IT/ e-banking/ systems units in banks. 18 % of survey respondents were specialized in Fund management and Treasury units in banks. We also had 10 % of respondents from Marketing & Cooperate Communication and 11 % specializing in Human Resources Management in banks.

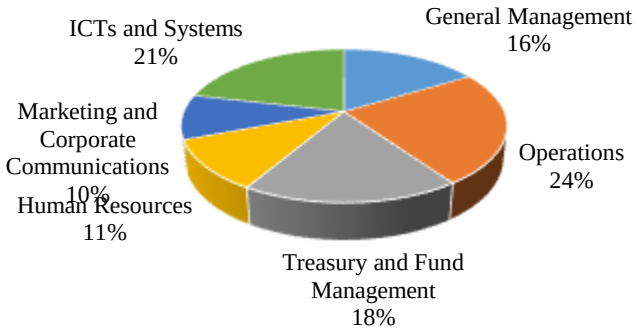

Figure 5.3 : Distribution of Respondents'' Domain of Speciality

Figure 5.4 shows the graphical distributions of the levels of academic qualifications of the survey respondents. The majority of respondents have graduate and post-graduate qualifications from a university. While 27 % of respondents had a bachelor's degree from a university, 16 % had a post-graduate qualification. 38 % of respondents had a professional banking qualification. The remaining respondents had different qualificaions other than the above-mentioned categories. In banking, certain professional qualifications are valued at the same level as certain academic qualifications. As such, these categories are not sorted according to any order and modelled as a nominal variable.

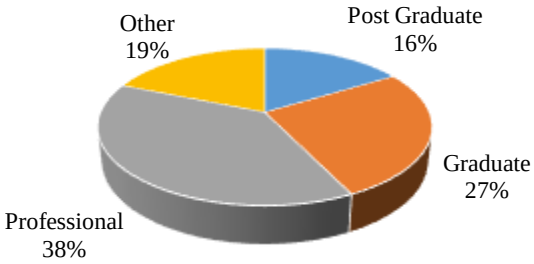

Figure 5.4 : Distribution Respondents' Highest Qualification

5.4.2 Distribution of Firm Characteristics

The following graphs present the distributions of banking organizations according to ownership category. There are 9 local state owned banks, 13 local privately owned

banks and 12 foreign banks in this sample. All these organizations were included in the survey.

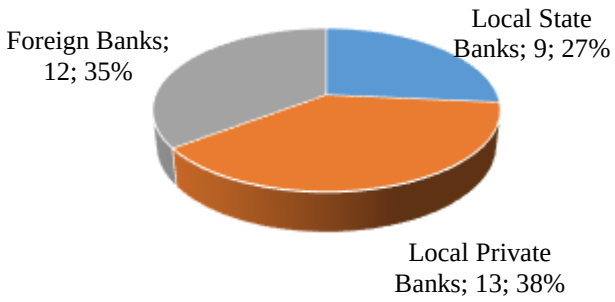

Figure 5.5 : Distribution of Firm Ownership

On the other hand, there are 26 commercial banks and 9 specialized banks in Sri Lanka. All these organizations were included in the survey.

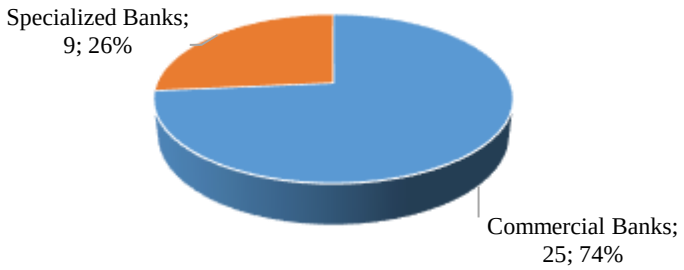

Figure 5.6 : Distribution of Firm Domain

5.5 Descriptive Statistics

Important characteristics in a set of data are explained using the descriptive statistics (Tabachnick & Fidell, 2007). Using descriptive statistics allow to present data in a meaningful manner. Statistical packages such as SPSS offers summaries of data by calculating descriptive statistics. Descriptive statistics are used to describe how the data values vary within one indicator variable. Such statistics are helpful to obtain a better understanding on the data values and the amount of their variation for each variable.

Five descriptive statistics namely, minimum, maximum, mean, mode and the standard deviation are considered in this study. There is a total of 12 indicator variables measuring the four main theoretical constructs in the conceptual model of this research shown. While many of these variables were measured through questions in the survey, a few of them were measured using objective data directly obtained through public sources. It is important to note that most of the variables used in this study are network measures (e.g. centrality) generated from the relational data using network analysis tools. The descriptive statistics for indicators representing the theoretical construct 'structural social capital' (using betweenness centrality) in the conceptual model are given in the tables 5.2. These statistics are obtained using SPSS 20.0. The descriptive statistics for the indicator variables representing the remaining constructs in the conceptual framework are given in the Appendix D.

Table 5.2 : Descriptive Statistics of Indicators of Structural Social Capital

Indicators of Structural Dimension: Betweenness Centrality					
Indicator variable		Minimum	Maximum	Mean	Standard Deviation
STR 1	34	0.0000	.0087	.001391	.0031237
STR 2	34	0.0000	.0373	.005350	.0102156
STR 3	34	0.0000	.2341	.041388	.0584212

5.6 Summary

This section discussed significant steps followed in this research to resolve issues related to the collected data in the process of preparing the data for the analysis. During data screening in this research, missing data, extreme data values and normality of data distributions are examined. Largely incomplete responses were removed from the collection. Randomly missing data values were imputed by replacing with the mean value. A few outliers are examined and retained with justifications. The impact of non-normality is considered minimum in this study due to the choice of appropriate techniques of estimation (i.e. the use of PLS and Bootstrapping). Data is pre-examined descriptive statistics were observed. With necessary remedies taken for identified issues and general understanding obtained of collected data, the data set is prepared to proceed to SEM analysis.

Chapter 6

ANALYSES, RESULTS AND VALIDITY

6.1 Introduction

The purpose of this chapter is to provide a holistic view of the analyses carried out while delivering a detailed understanding of the process and results. The multiple analyses are designed in such a way that the research questions are addressed. This research uses both the PLS-SEM technique and network analysis tools to investigate the role of three dimensions of social capital towards inter-bank strategic collaboration in the Sri Lankan banking industry and also identify other factors that may strengthen or weaken the effects. The conceptual model developed in this study is tested based on different sets of indicators. Firstly, indicators can be categorized as network measures and regular indicators. The network measures are further classified to test different structural properties under the structural dimension only. The outcomes of these approaches are then compared. The model with network measures was used to further investigate the effects of ICT related moderators that may strengthen or weaken the identified relationships.

This chapter is organized in the following manner. The Section 6.2 presents a summary of the criteria used for model validation in PLS-SEM. The Section 6.3 presents the results of PLS-SEM estimation of the main conceptual model. It presents results of alternative measurement models and explains the model validity. This section also presents a comparison of the results of above analyses. Section 6.4 presents the tests of moderation effects carried out to identify what other factors can strengthen or weaken the above identified effects. Section 6.5 presents some additional analyses to test a few extended versions of the model. Here, the impact on the firm performance is investigated. Also, the effect on the CSR of organizations is investigated. Section 6.6 discusses MRQAP analysis as an alternative approach to test the model. Finally, the Section 6.7 presents the conclusion summarising the findings.

6.2 Criteria of Assessment Used for Analyses

As discussed in the methodology chapter, this research uses the process model presented by Urbach and Ahlemann (2010) for PLS-SEM research which was presented in the figure 4.3 in Chapter 4. The process model involves a set of steps starting from formulating of a theory incorporating a set of theoretical constructs and the relationships between them as hypothesized based on the literature. The measurement model is then developed representing each theoretical construct using a block of observable indicators. The data is then collected from a suitable sample. After the data is subjected to preliminary analysis, the proposed theory is estimated for validity using the PLS-SEM algorithm. In this study, SmartPLS 3 software tool is used for the PLS estimations, which facilitates the estimation of both the measurement model and structural model in the same run. Following sections summarize the assessment criteria used for the PLS-based data analysis in this study.

6.2.1 Assessment of Measurement Models

A measurement model specifies the observable indicators for each latent construct. In this study, reflective measurement models are used for all the latent constructs, in which arrows go from the construct to the indicators, representing that the construct determines the values of the indicators. The different criteria used for assessing reflective measurement models in this research were discussed in the Chapter 4 and were summarized in the table 4.3 which is replicated below.

Table 6.1 : Assessment of Reflective Measurement Models (Original Table 4.3)

Validity	Criterion	Description	Literature
Internal consistency reliability	Cronbach's alpha (CA)	CA values range from 0 (completely unreliable) to 1 (perfectly reliable). For confirmative (explorative) research: CA > .800 or .900 (0.700). Values must not be lower than .600.	Cronbach (1951), Nunally and Bernstein (1994)
Internal consistency reliability	Composite reliability (CR)	CR values can range between 0 (completely unreliable) and 1 (perfectly reliable). Proposed threshold value for confirmative	Werts et al. (1974), Nunally and

		(explorative) research: CA > .800 or .900 (0.700). Values must not be lower than .600.	Bernstein (1994)
Indicator reliability	Indicator loadings	Indicators loadings higher than .70 is accepted. For exploratory research designs, lower thresholds (.050) are acceptable. The significance can be tested using bootstrapping	Chin (1998b)
Convergent validity	Average variance extracted (AVE)	Proposed threshold value: AVE > 0.500.	Fornell and Larcker (1981)
Discriminant validity	Cross-loadings	If the loading of each indicator is higher for its designated construct than for any of the other constructs, and each of the constructs loads highest with its own items, the constructs differ sufficiently from one another.	Chin (1998b)
Discriminant validity	Fornell-Larcker criterion	AVE of each LV should be greater than the LV's highest squared correlation with any other LV.	Fornell and Larcker (1981)
Discriminant validity	heterotrait-monotrait ratio of correlations (HTMT)	If the HTMT value is below 0.90, discriminant validity has been established between two reflective constructs.	Henseler, Ringle and Sarstedt (2015)
Measurement Model Fitness	The standardized root mean square residual (SRMR)	A model has good fit when SRMR is less than .08 or less than .10	(Hu & Bentler, 1998). (Henseler, et al. 2014)

6.2.2 Assessment of Structural Models

A structural model consists of both the theoretical constructs and the relationships between them. In PLS-SEM, structural models (inner model) can be analysed using measures of the model's predictive capabilities. The appropriate validity criteria used for structural model evaluation in this study were described in the

Chapter 4 and were summarized in the table 4.4 which is replicated below for fast reference.

Table 6.2 : Assessment of Structural Models (Original Table 4.4)

Criterion	Description	Literature
Coefficient of determination (R^2)	Values of approximately .670 are considered substantial, values around .333 moderate, and values around	Chin (1998), Ringle (2004)
Path coefficients	Path coefficients between the LVs should be analysed in terms of their algebraic sign, magnitude, and significance	Huber et al. (2007)
Path significance (bootstrapping)	Path coefficients between the LVs should be analysed for their significance	Efron (1979); Efron and Tibshirani (1993)
Effect size (f^2)	Values of .020, .150, .350 indicate the predictor variable's low, medium, or large effect in the structural model.	Cohen (1998), Chin (1998b), Ringle (2004
Predictive relevance (Q^2)	Higher Q2 suggests better predictive relevance. Modifications to a model may be evaluated by comparing the Q2 values. The accepted threshold is Q2 > 0.	Stone (1974), Geisser (1975), Fornell and Cha (1994

6.2.2.1 Model Fit Criteria

Even though PLS-SEM lacks global GoF measures, SmartPLS package offers a few recently proposed model fit criteria which are used in this study. These model fit criteria have been explained in the Chapter 4 and summarized in the table 4.5 which is replicated below.

Table 6.3 : Assessment of Model Fit (Original Table 4.5)

Model Fit Criteria	Results of Analysis
SRMR	SRMR should be less than .08 (Hu & Bentler, 1998)
d_ULS	Difference should be non-significant ($p > 0.05$).
d_G	

6.2.3 Assessment of Moderation Effects

For the tests of moderation effects, both the **product term approach** and the **group comparison approach** can be performed using SmartPLS. While in the the group comparisons, the researcher attempts to identify whether certain path coefficients differ across groups, in the product term approach, the checks are made to identify any interaction effects among independent variables. When interpreting the results of moderation analysis in PLS path models, both the significance and the strength of moderating effect should be determined. The following table including a summary of criteria used to assess moderation effects in this study is replicated from the Chapter 4 for fast reference.

Table 6.4 : Assessment of Moderation Effects (Original Table 4.6)

Type	Authors	Criteria
Group Comparison **PLS-MGA**	Chin and Dibben (2010)	Group difference is significant if the significance (p-value) is smaller than 0.05 or larger than 0.95 for the difference of group-specific path coefficients.
Interaction Terms	Baron and Kenny (1986), Chin et al. (2003)	**Significance of moderation effect** Moderating effect is significant if the path coefficient from interaction term to endogenous variable is significant regardless of the values of direct effects from exogenous variable and the moderator.
	Henseler and Fassott (2010), Chin et al. (2003)	**Strength of moderation effect** • R2 of the main effect model (without moderator) with the R2 of the full model (including the moderator) is different. • Moderating effects with effect sizes f^2 of 0.02 may be regarded as weak, from 0.15 as moderate, and above 0.35 as strong. Effect size can be calculated as f^2 = (R^2 model with moderator - R^2 model without moderator) / 1- R^2 model with moderator. Cohen (1988, p. 410–414). • In standardized variables, if the moderator variable is 1, the exogenous variable's influence on the endogenous variable is x + y (x = path coefficient from independent variable to dependent variable, y = path coefficient of the interaction term) • Path coefficient capturing the moderating effect differs significantly from zero.

6.2.4 Presentation of PLS Results

The next sections of this chapter detail the results and findings of the multiple analyses performed in this research. For consistency, the results of PLS estimations for different models are presented the same order for each model using the order given below.

1. Presentation of the Measurement Model
2. Results of Measurement Model Reliability and Validity
3. Presentation of the Structural model (Graphical representation of model)
4. Results of Structural Model Validity
5. Results and Discussion

6.3 Analysis 1: Model of Social Capital-based IOC

6.3.1 Development of Measurement Models

The main focus of this study is to investigate how the different dimensions of social capital drive inter-organizational collaborations. A new theoretical model is developed and validated through PLS-SEM. As the first step of performing PLS-SEM, the theoretical constructs related to social capital based inter-organizational relationships have been defined. The indicators representing those theoretical constructs were also identified from literature. The development of conceptual model, the defining of theoretical constructs and the identification of appropriate indicators are explained in detail in Chapter 3 of this thesis.

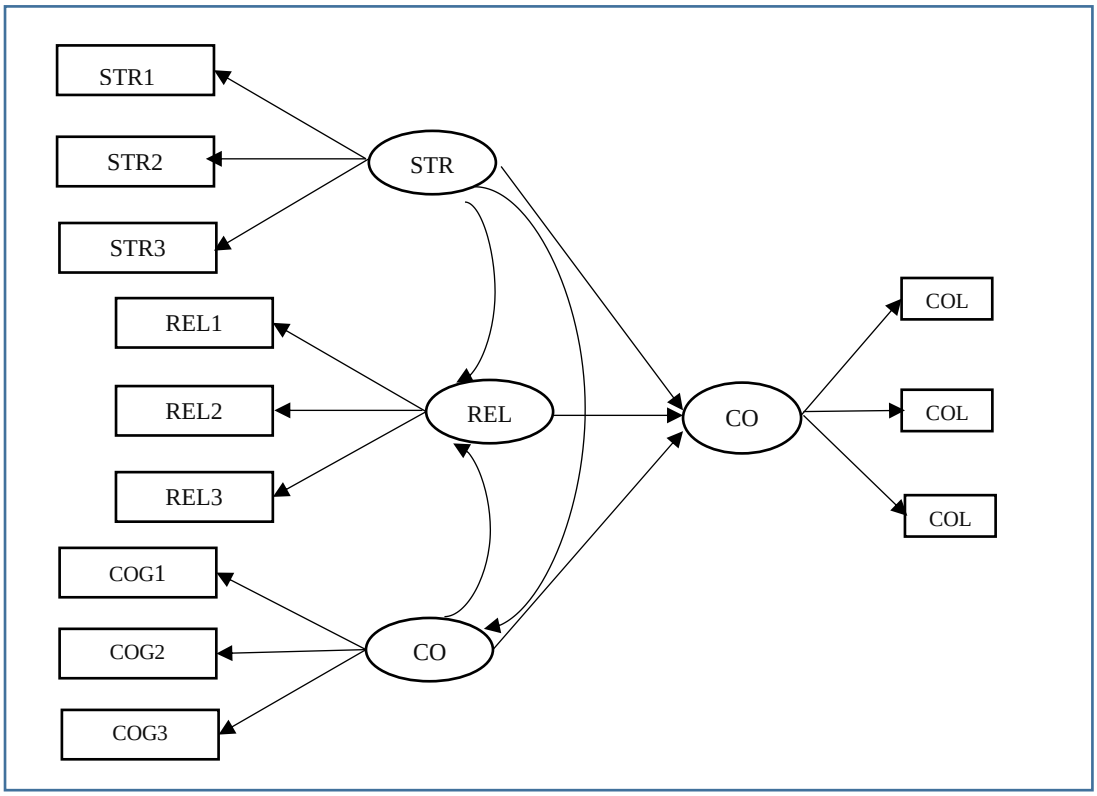

Figure 6.1 : Measurement Model

The measurement model is developed as shown in figure 6.1. The model contains four unobserved theoretical constructs as Degree of Strategic Collaboration (COL),

Structural Dimension of Social Capital (STR), Relational Dimension of Social Capital (REL), Cognitive Dimension of Social Capital (COG). The unobserved constructs are shown as ovals

Each of the unobserved constructs is represented by several indicator variables which are shown in rectangles. For example, the reflective indicators of theoretical construct STR is represented by indicator variables STR1 to STR3. Similarly, the rest of the indicators are named according to the name of the relevant theoretical construct. The summary of indicators representing the unobserved theoretical constructs is given in the table 6.5.

Table 6.5 : Summary of Indicators Representing the Theoretical Constructs

Construct	Definition		Indicators
Structural Social Capital (STR)	Degree of interbank social interactions of a firm	STR1	Participation in inter-bank social events
		STR2	Frequency of inter-bank social interactions
		STR3	Directors' social links through affiliations
Relational Social Capital (REL)	Trustworthiness of a firm	REL1	Non-opportunistic behaviour
		REL2	Promise keeping
		REL3	Institutional reputation
Cognitive Social Capital (COG)	Degree of shared understandings with other organizations	COG1	Shared vision
		COG2	Shared understandings (norms)
		COG3	Shared market knowledge
Collaboration (COL)	Involvement in interbank alliances	COL1	Number of alliance partners
		COL2	Number of participated alliances
		COL3	No of times total partnerships

6.3.1.1 Alternative Measurement Models

In this study, an exploratory analysis is carried out to test the predictability of model using alternative blocks of indicators for theoretical constructs. Different versions of the model are assessed using alternative blocks of indicators representing theoretical constructs. Such analysis enable to answer the following questions;

1. What structural property (centrality, density, brokerage capacity) of inter-organizational social networks may better predict the inter-organizational collaboration?
2. What type of centrality (degree, closeness, eigenvector, betweenness) in the social network may better predict the inter-organizational collaboration?
3. Can the network indicators better predict the inter-organizational collaboration than direct indicators?

To investigate 'what structural quality of inter-organizational social networks may better predict the collaboration?', alternative network measures presenting different structural qualities in firm's ego network are explored in this study. Particular structural properties such as centrality, brokerage and density of social interaction networks may predispose actors to engage in further, more formal collective actions. Alternative centrality measures (for e.g. Degree, Closeness, Eigenvector, Betweenness) are explored in order to get a clearer understanding of what kind of centrality in inter-organizational social network may better predict the formal collaboration. While '***Degree centrality***' answers the question of '*Does a firm's overall social network position (central or peripheral) has any effect on its formal partnerships with other organizations?*', '***Closeness centrality***' answers '*Do organizations with short social paths to all other organizations do better in formal partnerships with other organizations?*'. Similarly, '***Eigenvector centrality***' answers the question: '*Does an organization surrounded by other organizations that are highly social do better in formal partnerships with other organizations?*'. Moreover, '***Betweeness centrality***' answers '*Do organizations having high potential for controlling and accessing information flows between other organizations within the social network do better in formal partnerships with other organizations?*'. In addition, the direct measurements are used instead of network properties to test the

model and the results are compared with the results of the models which used network measurements as indicators of the independent constructs.

Social network analysts have developed many tools for conceptualizing and indexing the variations in the kinds of structural aspects. The network measurements used to measure different aspects of social capital in literature are summarised in the table 6.6.

Table 6.6 : The Network Measurements used in this Study

Construct	**Meaning in this study**	**Network Measure**	**Associated Concepts**	**References (similar uses)**
Structural social capital	Social Popularity	Degree centrality	Centrality, popularity	Tsai and Ghoshal, 1998
	Social Proximity	Closeness centrality	Quick access, proximity	Borgatti and Everett, 1998
	Social leadership	Eigenvector centrality		Borgatti and Everett, 1998
	Social betweenness	Betweenness centrality	Brokerage, go-between, overall connectedness	Tsai and Ghoshal, 1998; Heng et al. 2005; Hanson et al. 2008; Hawe, and Ghali 2008; Balkundi, et al. 2009; Creswick, N. and Westbrook 2010; Di Marco, and Taylor et al. 2010
	Structural holes	Effective network size	Structural holes	Borgatti and Everett 1998; Cummings and Cross 2003; Susskind et al. 2011; Heng et al. 2005
Relational social capital	Trustworthiness	In degree centrality	Trustworthi-ness	Tsai and Ghoshal 1998

Cognitive social capital	Shared understandings (Cognitive proximity)	Closeness centrality	-	-
Collaboration	Collaboration	Degree centrality	Inter-organizational collaboration	Zhao at el 2012
		In degree centrality	Resource exchange	Tsai and Ghoshal 1998

For each of the different measures listed under the structural dimension, a different measurement model is created representing the construct 'structural dimension' and is tested. The literature related to identification of these measures are detailed in the Chapter 2. A brief summary of interpretations for each of the network measures used in this study is given in the table 6.7.

Table 6.7 : Interpretations of Network Measurements

Measure	Description	References
Betweenness Centrality	The extent that a node is a broker of indirect connections among all other nodes in a network. This entity connects disconnected groups, like a Go-between. Betweenness measures the number of times that connections must pass through a single individual to be connected.	Freeman, 1979
Closeness Centrality	The average closeness of a node to the other nodes in a network. The ones with the highest closeness have the shortest paths to all others, can send or receive information faster and will have the best picture of what is happening in the network as a whole.	Freeman, 1979
Eigenvector Centrality	Entity most connected to other highly connected entities. Assists in identifying those who can mobilize others. A node is central to the extent that its neighbours are central. Higher the eigenvector centrality, better ability to spread information quickly and better the leadership position.	Bonacich, 1972
Total Degree Centrality	The Total Degree Centrality of a node is the normalized sum of its row and column degrees. Nodes that are "in the know" are those who are	Wasserman 1994

	linked to many others and so, by virtue of their position have access to the ideas, thoughts, and beliefs of many others.	
Effective Network Size	The effective size of a node's ego network based on redundancy of links. The more each node is disconnected from other primary contacts, the higher the effective size would be	Burt, 1992
In degree	The in-links (connections / nominations) that the node of interest receives from other nodes	Wasserman 1994

In addition to the network measures, the model is also assessed using regular indicators instead of using network measurements. The regular indicators used to represent the constructs are listed in the table 6.8.

Table 6.8 : Regular Indicators used to Represent the Constructs

Construct	**Indicator**	**Non-Network Indicators Description**
Structural Dimension	STR1	Number of social event types participating
	STR2	Number of banks frequently socially interacting with
	STR3	Number of Directors' having links with other banks
Relational Dimension	REL1	Number of banks nominating a bank on previous non-opportunistic behaviour
	REL2	Number of banks nominating a bank on previous promise keeping
	REL3	Number of banks nominating on institutional reputation
Cognitive Dimension	COG1	No of banks sharing vision
	COG2	No of banks sharing work understanding/ norms
	COG3	No of market segments involved in

Accordingly, 6 different versions of the model are created using alternative blocks of indicators. Table 6.9 summarizes the indicators used in each of those models.

Table 6.9 : Summary of Alternative Measurement Models

		Model1 (Betweenness Centrality)	**Model2 (Effective Network Size)**	**Model3 (Eigenvector Centrality)**	**Model4 (Closeness Centrality)**	**Model5 (Degree Centrality)**	**Model6 (Non-network measures)**
Structural Social Capital (Social interactions)	Participation in social events	STR_N1_1	STR_N2_1	STR_N3_1	STR_N4_1	STR_N5_1	STR_R_1
	Frequency of social interactions	STR_N1_2	STR_N2_2	STR_N3_2	STR_N4_2	STR_N5_2	STR_R_2
	Directors' social links	STR_N1_3	STR_N2_3	STR_N3_3	STR_N4_3	STR_N5_3	STR_R_3
Relational Social Capital (Trustworthiness)	Non-opportunistic behaviour	(In degree centrality) - REL_N_1					REL_R_1
	Promise keeping	(In degree centrality) - REL_N_2					REL_R_2
	Institutional reputation	(In degree centrality) - REL_N_3					REL_R_3
Cognitive Social Capital (Shared understandings)	Shared vision	(Closeness centrality) - COG_N_1					COG_R_1
	Shared understandings	(Closeness centrality) - COG_N_2					COG_R_2
	Shared market knowledge	(Closeness centrality) - COG_N_3					COG_R_3
Endogenous Constructs							
Degree of partnerships	Number of distinct partners – COL1						
	Number of alliances participated – COL2						
	No of total partnerships – COL3						

Each model is different only in terms of the use of alternative blocks of indicators for structural dimension. The structural dimension is operationalized using different measures attesting to different locational properties in the inter-organizational social interactions networks. However, the operationalization of other two dimensions remain same across all models. The relational dimension is operationalized as the 'trustworthiness' of organizations through the nominations of other organizations and the indegree centrality was used to derive the trustworthiness of a firm. The cognitive dimension is operationalized as the 'shared understandings' and the closeness centrality was used to measure the average closeness to all other organizations in terms of 'shared vision, shared norms and shared knowledge'.

Models developed in the above manner were then assessed for validity using PLS algorithm through the SmartPLS software using the data collected from the banking industry in Sri Lanka. SmartPLS provides estimates for both outer models (measurement models) and inner model (structural model). The following sections present the PLS results obtained for each model. For each alternative measurement model, the labels of indicators can be referenced back and forth from the above table. The discussion of results and the model comparison is given after presenting the PLS estimations for all the models.

6.3.2 Results of PLS Assessment of Model1

Measurement Model1:

In the measurement model1, the structural dimension is operationalized using **betweenness centrality** in the inter-organizational social interactions networks. Betweenness is a measure of the number of times a node occurs on a path. In this study, betweenness centrality answers the question *'Does an organization serving as a gatekeeper within the inter-organizational social interactions network do better in formal partnerships with other firms?*'. The full measurement model hypothesized structural relationships developed for this research using SmartPLS is shown in the figure 6.2. The model was estimated using SmartPLS based the data collected from the survey and public sources in the banking sector in Sri Lanka.

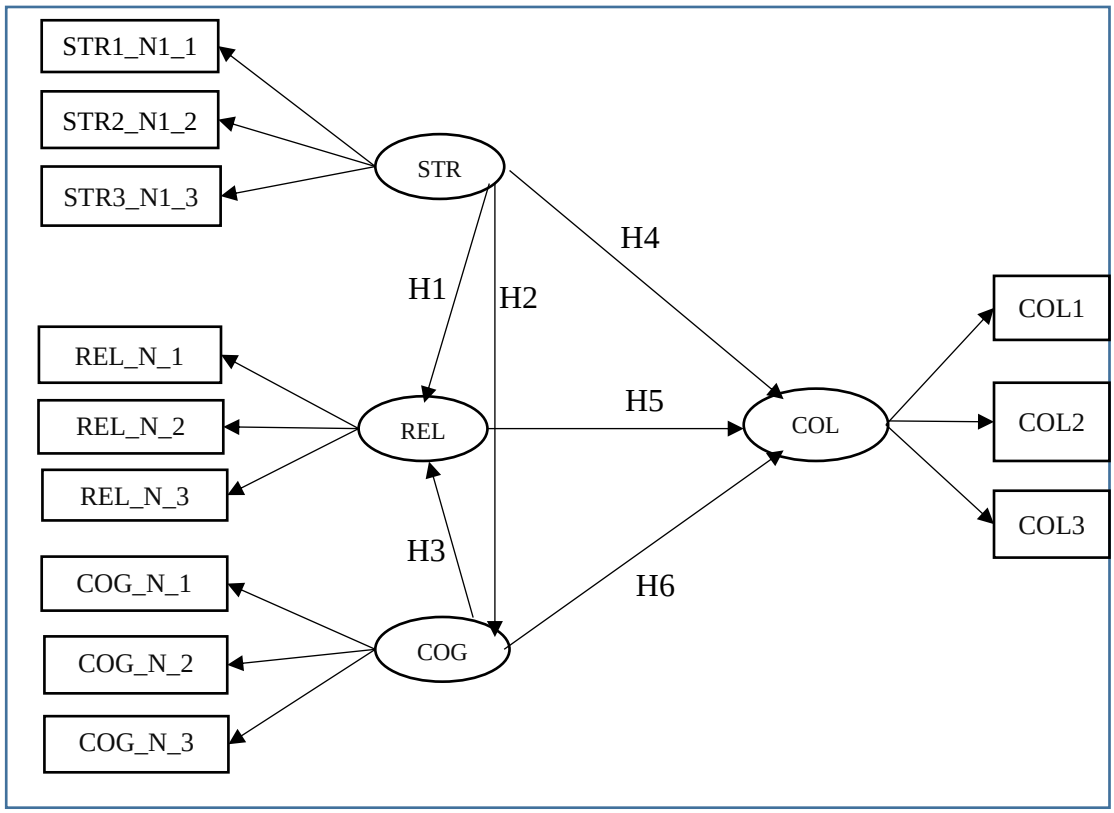

Figure 6.2 : Initial Full Measurement Model1

The results received by estimating the measurement model are presented in the table 6.10. This enable to evaluate the internal consistency and indicator reliability of measurement models used for theoretical constructs in the model.

Table 6.10 : Convergent Validity Results for Initial Measurement Model1

Construct	Internal Consistency		Indicator Reliability	
	Composite reliability (CR)	**Average Variance Extracted (AVE)**	**Item**	**Standard Factor Loadings (SFL)**
STR	0.885	0.720	STR_N1_1	0.769
			STR_N1_2	0.891
			STR_N1_3	0.879
REL	0.801	***0.607***	REL_N_1	0.961
			REL_N_2	0.885
			REL_N_3	***0.335***
COG	0.792	***0.574***	COG_N_1	0.876
			COG_N_2	0.852
			COG_N_3	***0.476***
COL	0.977	0.934	COL1	0.948
			COL2	0.974
			COL3	0.977

The validity of the initial measurement model was examined through the criteria summarized in the section 6.2.2 and steps were taken to improve the fitness of the initial measurement model. In order to improve fitness, modifications were done based on the SFLs. The measurement model was improved by removing the indicators with low loadings. As such, the items with a factor loading above the cut-off point 0.50 are retained for further analysis (Hair, Black, Babin, & Anderson, 2010). During this process, indicator COG_N_3 from cognitive dimension (COG) and the indicator REL_N_3 from relational dimension (REL) were removed from the measurement model. The modified measurement model is then re-estimated.

In this research, the convergent validity of the constructs in the measurement models was assessed based on AVE, SFLs and Construct Reliability. The SFLs of the indicator variables, AVEs and the construct reliability obtained for measurement model is shown in the table 6.11. The CR value for all constructs in measurement model exceeded the cut-off value of 0.7. Furthermore, AVEs estimated for all the constructs measurement model exceeded the cut-off value of 0.5. All indicator variables measuring theoretical constructs have SFLs exceeding the cut off-value of 0.5. Such

results indicate that the theoretical constructs in the measurement models have adequate convergent validity.

Table 6.11 : Convergent Validity of Modified Measurement Model1

Construct	Internal Consistency		Indicator Reliability	
	Composite reliability (CR)	Average Variance Extracted (AVE)	Item	Standard Factor Loadings (SFL)
STR	0.884	0.719	STR_N1_1	0.762
			STR_N1_2	0.892
			STR_N1_3	0.884
REL	0.936	0.880	REL_N_1	0.929
			REL_N_2	0.947
COG	0.873	0.775	COG_N_1	0.846
			COG_N_2	0.913
COL	0.977	0.934	COL1	0.949
			COL2	0.973
			COL3	0.976

Three criteria have been used to evaluate discriminant validity of measurement models in this study, namely, Fornell-Larcker criterion (Fornell and Larcker, 1981), the assessment of cross-loadings (Chin, 1998) and the heterotrait-monotrait ratio of correlations – HTMT (Henseler, Ringle and Sarstedt, 2015). The discriminant validity results using Fornell-Larcker criterion is shown in the table 6.12. The AVEs of each construct are shown across the diagonal of the tables. These AVE values exceeded square of correlation between that construct and all the other constructs. Moreover, none of the indicators cross loaded on multiple theoretical constructs. All the HTMT values below 0.90, also indicates that the discriminant validity has been established between two reflective constructs. Such results indicate that the constructs in the measurement model have adequate discriminant validity.

Table 6.12 : Discriminant Validity Results for Model1

	COG	REL	STR	COL
COG	0.880			
REL	0.682	0.938		
STR	0.541	0.666	0.848	
COL	0.655	0.808	0.748	0.966

Structural Model1:

The structural model developed for this research contains four unobservable theoretical constructs represented by LVs, namely, Degree of Strategic Collaboration (COL), Structural Dimension of Social Capital (STR), Relational Dimension of Social Capital (REL), and Cognitive Dimension of Social Capital (COG). The relationships among the above latent constructs in the structural model represent six hypotheses denoted by H1, H2, H3, H4, H5, and H6.

The structural model above is estimated using PLS based on the data collected from the banking industry in Sri Lanka. The structural model validity was evaluated through several criteria, namely, path coefficients, path significance, coefficient of determination – R^2, effect size -f^2 and several model fit criteria. These criteria used for assessment of validity in structural model are summarized in the section 6.2.3.

The results received from the PLS estimation are shown in following table 6.13. Each row in the table contains the respective path coefficient and the level of its significance in terms of P value and T statistics obtained from bootstrapping.

Table 6.13 : Path Coefficients and Significance for Structural Model1

Path	Hypothesis	Path Coefficient	P value	T Statistics
COG > REL	H3	0.455	0.000	4.498
COG > COL	H6	0.137	0.200	1.282
REL > COL	H5	0.478	0.000	3.792
STR > COG	H2	0.541	0.000	7.001
STR > COL	H4	0.355	0.025	2.246
STR > REL	H1	0.419	0.004	2.865

Bootstrapping is carried out using 5000 randomly drawn subsamples is used to test the significance of estimated path coefficients in PLS-SEM. The parameter estimates from the subsamples are used to derive standard errors for the estimates. With this information, t-values are calculated to assess each estimate's significance. Hair et al. (2014) explain bootstrapping in more detail.

The structural model with the results of PLS estimation is shown in the figure 6.4. The estimated results for the above structural model shows a strong support for H1, H2,

H3, H4 and H5 with path estimates of 0.419, 0.541, 0.455, 0.355, 0.478 and and P value less than 0.01 and T-statistics of greater than 1.9. However, the estimation reveals that the relationships indicated by H6 in the structural model is not supported. It is indicated by the path estimates of 0.137 with a P value of 0.200.

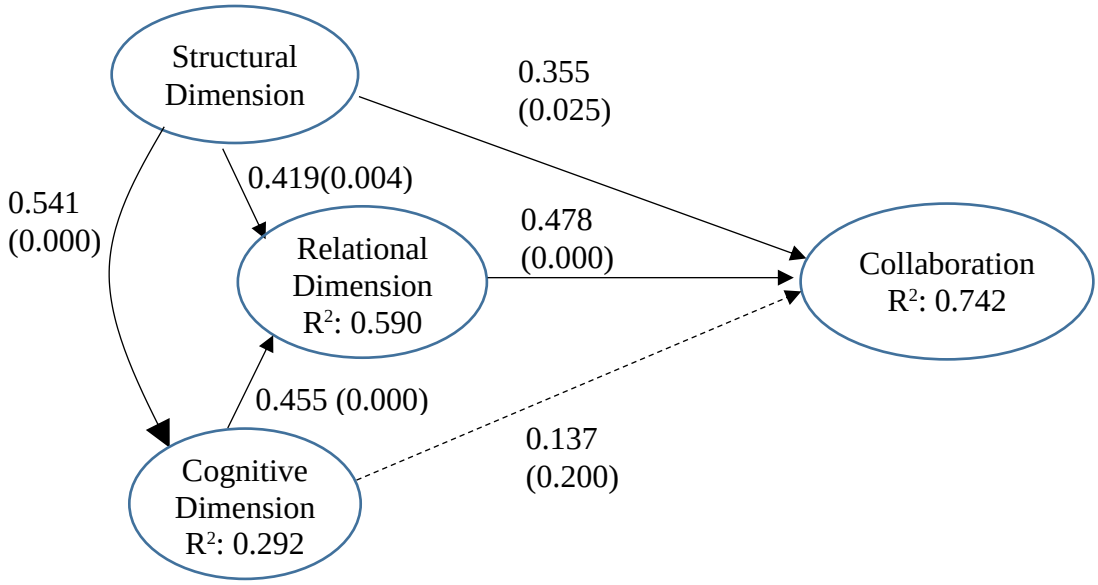

Figure 6.3 : Estimated Structural Model1

In the figure 6.3, the significant paths are indicated using thick arrows and the insignificant paths are indicated using dashed arrows. The labels on each arrow represent the estimated path coefficient along with its P value within brackets. The same notations are used in the other models presented in this chapter. Each endogenous construct's coefficient of determination (R^2) is used as the key criterion to determine the effect size. In SmartPLS output, the R-square values are shown inside the blue ellipses for endogenous latent variables (Garson-2016). In the figure 6.3, the estimated R^2 for each endogenous construct is given within the ellipses denoting the respective construct. In the area of information systems, R^2 values of approximately .670 are considered substantial explanatory power (Chin 1998). Therefore, the R^2 of 0.742 estimated in this model indicates substantial explanatory power and predictability.

In addition, the effect size is also evaluated through f^2 (Cohen 1988; Cohen 2013) to test if each independent construct has a substantial impact on the dependent construct. Values above 0.02, 0.15 and 0.35 indicate a "small", "medium", or "large" effect respectively (Chin 1998b; Cohen 1988; Gefen et al. 2000). The estimated results for

f^2 is given in the table 6.14. In this study, while the relational social capital has a "large" effect on inter-organizational collaboration, the structural social capital has a "medium" effect. While the effect of structural dimension on cognitive dimension is "large", its effect on relational dimension is "medium". The cognitive dimension also has a "large" effect on the relational dimension.

Table 6.14 : Estimated Results for Structural Model1 - Effect Size (f2)

	COG	REL	STR	COL
COG	-	0.358	-	0.038
REL	-	-	-	0.363
STR	0.413	0.304	-	0.265

SmartPLS provides a few model-fit criteria for PLS models. However, unlike in CB-SEM, the model fit assessment criteria available for PLS-SEM are still in their very early stage of research and not fully understood (Henseler et.al. 2014). Table 6.15 summarizes fit results for three model fit criteria, namely, Standardized Root Mean Square Residual, Geodesic distance and Normed fit index.

The standardized root mean square residual (SRMR) is defined as the difference between the observed correlation and the model implied correlation matrix. Henseler et al. (2014) introduce the SRMR as a goodness of fit measure for PLS-SEM that can be used to avoid model misspecification. A value less than 0.10 or of 0.08 in a more conservative version (Hu and Bentler, 1999) are considered a good fit. Accordingly, the SRMR value of 0.072 in this research indicates a good fit.

Table 6.15 : Model Fit Results for Structural Model1

Model Fit Criteria	Author	Criteria	Results
SRMR (Standardized Root Mean Square Residual)	Henseler et al. (2014)	Value should be less than 0.10 (or 0.08 in a more conservative version) is a good fit	SRMR = 0.072
d_G (Geodesic distance)	Dijkstra and Henseler (2015)	Bootstrap results should be non-significant (p>0.05)	d_G = 0.583 P value =0.221
NFI (Normed fit index)	Bentler and Bonett (1980)	Value should be closer the to 1	NFI = 0.798

Also, the exact model fit tests such as the geodesic distance (d_G) tests the statistical (bootstrap-based) inference of the discrepancy between the empirical covariance matrix and the covariance matrix implied by the composite factor model (Dijkstra and Henseler 2015). A model fits well if the difference between the correlation matrix implied by the model and the empirical correlation matrix is non-significant ($p > 0.05$). In this study, the value of d_G is 0.583 and the P value after bootstrapping is 0.221 which is insignificant.

This indicates that model fit has been established. Normed Fit Index (NFI) is one of the first fit measures proposed in the SEM literature (Bentler and Bonett 1980) that represents an incremental fit measure. It computes the Chi^2 value of the proposed model and compares it against a meaningful benchmark. The NFI results in values between 0 and 1. The closer the NFI to 1, the better the fit (Lohmöller 1989). In this study, the NFI value of 0.798 indicates adequate fit.

6.3.3 Results of PLS Assessment of Model2

Measurement Model2:

Another version of the model was developed with another alternative block of indicators for structural dimension using **degree centrality** network measure. The degree centrality is the sum of all direct contacts of a member (node). In the context of this study, degree centrality answers the question *'Does the centrality of an organization in its social network (central or peripheral) has any effect on its formal partnerships with other organizations?*'

The validity of the measurement model was examined based on the results of the initial PLS estimation and the measurement model was improved through a similar procedure explained in Model1 previously. The modified measurement model is then re-estimated. The convergent validity and the construct reliability for measurement model is shown in the table 6.16.

Table 6.16 : Convergent Validity of Modified Measurement Model2

Construct	Internal Consistency		Indicator Reliability	
	Composite reliability (CR)	Average Variance Extracted (AVE)	Item	Standard Factor Loadings (SFL)
STR	0.864	0.686	STR_R_1	0.904
			STR_R_2	0.936
			STR_R_3	0.604
REL	0.936	0.880	REL_R_1	0.946
			REL_R_2	0.930
COG	0.873	0.776	COG_R_1	0.848
			COG_R_2	0.912
COL	0.977	0.934	COL1	0.949
			COL2	0.974
			COL3	0.976

As shown in the table 6.16, the CR value for constructs in measurement model exceeded the cut-off value of 0.7. Furthermore, AVEs estimated for all the constructs measurement model exceeded the cut-off value of 0.5. All indicator variables measuring theoretical constructs have SFLs exceeding the cut off-value of 0.5. Such results indicate that the theoretical constructs in the measurement models have adequate convergent validity.

The discriminant validity for measurement model2 using Fornell Larcker Criterion is shown in the table 6.17. The AVE values shown across the diagonal exceeded square of correlation between that construct and all the other constructs. Such results indicate that the constructs in the measurement model have adequate discriminant validity.

Table 6.17 : Discriminant Validity Results for Model2

	COG	REL	STR	COL
COG	0.881			
REL	0.682	0.938		
STR	0.609	0.700	0.828	
COL	0.655	0.808	0.729	0.966

Structural Model2:

The structural model developed with alternative blocks of indicators is shown in figure 6.4. The structural model is estimated using the collected data.

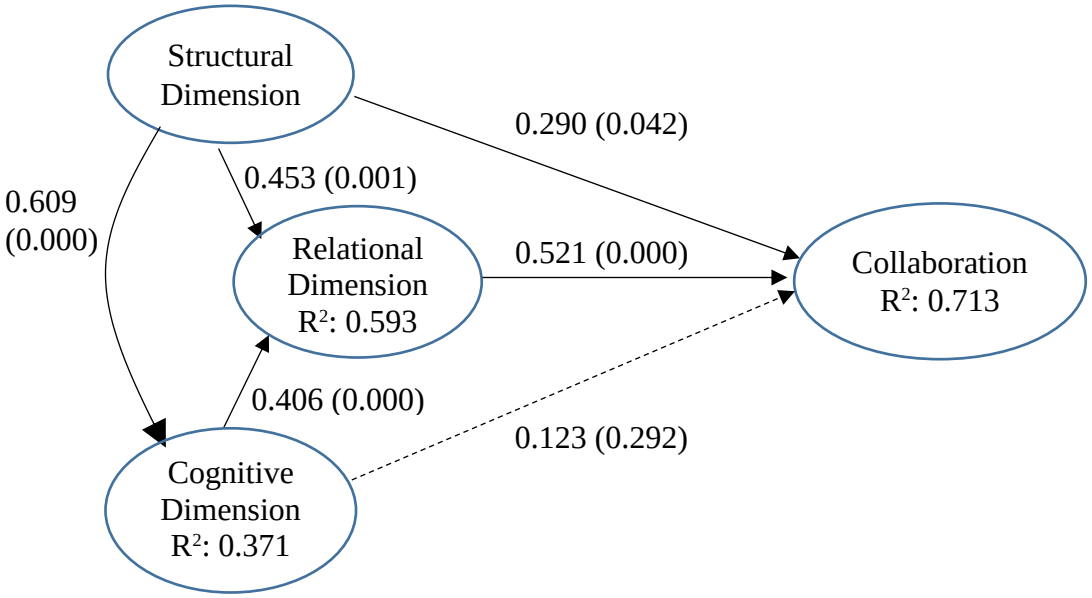

Figure 6.4 : Estimated Structural Model2

The estimated results for the above structural model shows a strong support for H1, H2, H3, H4 and H5 with path estimates of 0.453, 0.609, 0.406, 0.290 and 0.521 and P value less than 0.05. However, the relationship indicated by H6 in the structural model is not supported. The model fit results for the model 2 is summarized in the table 6.18.

Table 6.18 : Model Fit Results for Structural Model2

Model Fit Criteria	Results of Analysis
Standardized Root Mean Square Residual (SRMR)	0.082
d_G	0.529 (P value = 0.285)
NFI	0.813

6.3.4 Results of PLS Assessment of Model3

Measurement Model3:

Another version of the model was developed with another alternative block of indicators for the structural dimension using **Eigenvector Centrality** network measurement. Eigenvector Centrality reflects one's connections to other well-connected people. In this study, eigenvector centrality answers the question '*Does an*

organization having social links with other organizations that are prominent actors in the social network, do better in formal partnerships with other organizations?' It was estimated based the collected data using SmartPLS software tool. The validity of the measurement model was examined based on the results of the initial PLS estimation and the measurement model was improved through a similar procedure explained in Model1 previously. The modified measurement model is then re-estimated. The convergent validity and the construct reliability for measurement model is shown in the table 6.19.

Table 6.19 : Convergent Validity of Modified Measurement Model3

	Internal Consistency		**Indicator Reliability**	
Construct	**Composite reliability (CR)**	**Average Variance Extracted (AVE)**	**Item**	**Standard Factor Loadings (SFL)**
STR	0.874	0.776	STR_N3_1	0.915
			STR_N3_2	0.933
			STR_N3_3	0.540
REL	0.936	0.880	REL_N_1	0.945
			REL_N_2	0.931
COG	0.851	0.666	COG_N_1	0.849
			COG_N_2	0.911
COL	0.977	0.934	COL1	0.949
			COL2	0.974
			COL3	0.976

As shown in the table 6.20, the CR value for constructs in measurement model exceeded the cut-off value of 0.7. Furthermore, AVEs estimated for all the constructs measurement model exceeded the cut-off value of 0.5. All indicator variables measuring theoretical constructs have SFLs exceeding the cut off-value of 0.5. Such results indicate that the theoretical constructs in the measurement models have adequate convergent validity.

The discriminant validity for measurement model3 using Fornell Larcker Criterion is shown in the table 6.20. The AVE values shown across the diagonal exceeded square of correlation between that construct and all the other constructs. Such results indicate that the constructs in the measurement model have adequate discriminant validity.

Table 6.20 : Discriminant Validity Results for Model3

	COG	REL	STR	COL
COG	0.881			
REL	0.681	0.938		
STR	0.636	0.685	0.816	
COL	0.655	0.807	0.699	0.966

Structural Model3:

The structural model3 developed with alternative blocks of indicators is shown in the figure 6.5. The structural model is estimated using the collected data.

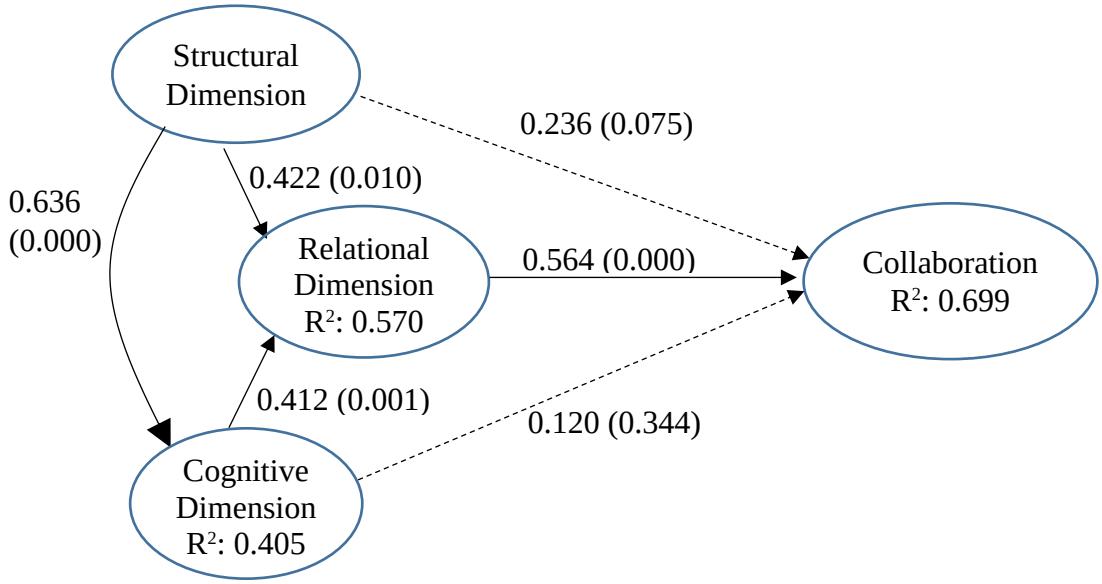

Figure 6.5 : Estimated Structural Model3

The estimated results for the above structural model shows a strong support for H1, H2, H3 and H5 with path estimates of 0.422, 0.636, 0.412 and 0.564 and P value less than 0.05. However, the relationship indicated by H6 in the structural model is not supported. The model fit results for the model3 is summarized in the table 6.21.

Table 6.21 : Model Fit Results for Structural Model3

Model Fit Criteria	Results of Analysis
Standardized Root Mean Square Residual (SRMR)	0.083
d_G	0.524 (P value = 0.263)
NFI	0.814

6.3.5 Results of PLS Assessment of Model4

Measurement Model4:

Another version of the model was developed with another alternative block of indicators for structural dimension using **closeness centrality** network measure. Closeness centrality indicates 'proximity' to all others in the network (Freeman, 1979). In the context of this study, closeness centrality answers the question *'Do organizations with short social "paths" to all other organizations in the network do better in formal partnerships (alliances) with other organizations*?'. The validity of the measurement model was examined based on the results of the initial PLS estimation and the measurement model was improved through a similar procedure explained in Model1 previously. The modified measurement model is then re-estimated. The convergent validity and the construct reliability for measurement model is shown in the table 6.22.

Table 6.22 : Convergent Validity of Modified Measurement Model4

	Internal Consistency		**Indicator Reliability**	
Construct	**Composite reliability (CR)**	**Average Variance Extracted (AVE)**	**Item**	**Standard Factor Loadings (SFL)**
STR	0.843	0.730	STR_R_1	0.910
			STR_R_2	0.795
REL	0.936	0.880	REL_R_1	0.945
			REL_R_2	0.930
COG	0.872	0.774	COG_R_1	0.839
			COG_R_2	0.919
COL	0.977	0.934	COL1	0.949
			COL2	0.974
			COL3	0.976

As shown in the table 6.22, the CR value for constructs in measurement model exceeded the cut-off value of 0.7. Furthermore, AVEs estimated for all the constructs measurement model exceeded the cut-off value of 0.5. All indicator variables measuring theoretical constructs have SFLs exceeding the cut off-value of 0.5. Such results indicate that the theoretical constructs in the measurement models have adequate convergent validity.

The discriminant validity for the measurement model4 using Fornell Larcker Criterion is shown in the table 6.23. The AVE values shown across the diagonal exceeded square of correlation between that construct and all the other constructs. Such results indicate that the constructs in the measurement model have adequate discriminant validity.

Table 6.23 : Discriminant Validity Results for Model4

	COG	REL	STR	COL
COG	0.880			
REL	0.683	0.938		
STR	0.709	0.710	0.854	
COL	0.657	0.808	0.719	0.966

Structural Model4:

The structural model4 developed with alternative blocks of indicators is shown in the figure 6.6. The structural model is estimated using the collected data.

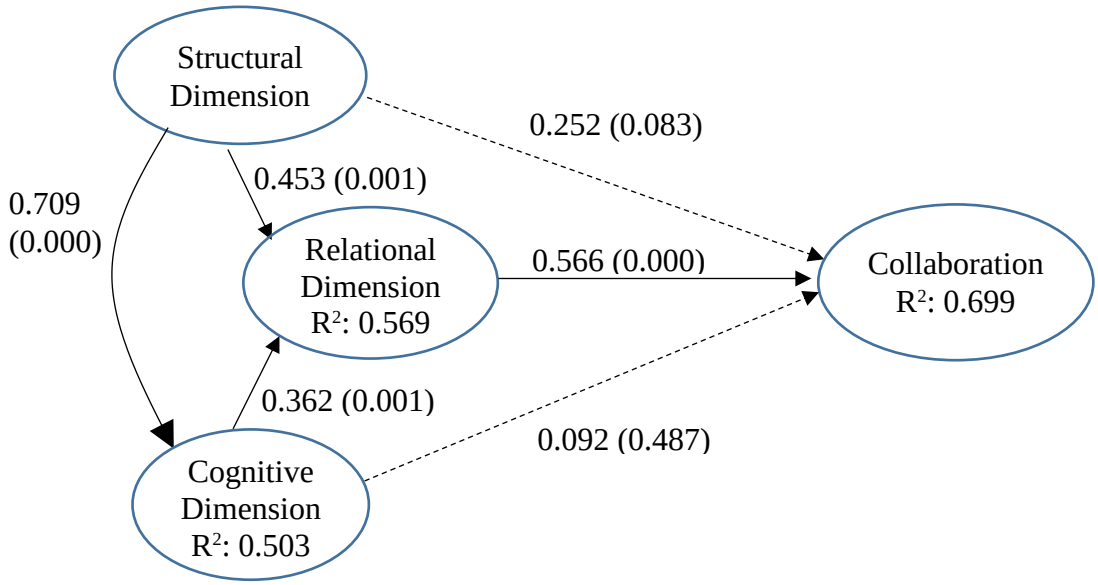

Figure 6.6 : Estimated Structural Model4

H1, H2, H3 and H5 with path estimates of 0.453, 0.709, 0.362 and 0.566 with P value less than 0.001. There is weak support for the relationship H4 with a path coefficient of 0.252 of marginal significance. However, the relationship indicated by H6 in the structural model is not supported. The model fit results for the model4 is summarized in the table 6.24.

Table 6.24 : Model Fit Results for Structural Model4

Model Fit Criteria	Results of Analysis
Standardized Root Mean Square Residual (SRMR)	0.084
d_G	0.420 (P value = 0.290)
NFI	0.814

6.3.6 Results of PLS Assessment of Model5

Measurement Model5

The second version of the model was developed with an alternative block of indicators for the structural dimension using the **effective network size** network measure. It is a commonly used measure of structural holes in a network. In this study, the 'effective network size' helps to answer the question 'Does the extent of spanning structural holes, has any effect on its formal partnerships with other organizations? It was estimated based the collected data using SmartPLS software tool. The validity of the measurement model was examined based on the initial results received and the measurement model was improved through a procedure similar to that of the Model1 previously. The modified measurement model is then re-estimated. The convergent validity and the construct reliability for measurement model is shown in the table 6.25.

Table 6.25 : Convergent Validity of Modified Measurement Model5

	Internal Consistency		Indicator Reliability	
Construct	Composite reliability CR)	Average Variance Extracted (AVE)	Item	Standard Factor Loadings (SFL)
STR	0.908	0.767	STR_N2_1	0.867
			STR_N2_2	0.905
			STR_N2_3	0.855
REL	0.936	0.880	REL_N_1	0.948
			REL_N_2	0.928
COG	0.873	0.775	COG_N_1	0.848
			COG_N_2	0.912
COL	0.977	0.934	COL1	0.949
			COL2	0.973
			COL2	0.976

As shown in the table 6.25, the CR value for all constructs in measurement model exceeded the cut-off value of 0.7. AVEs estimated for all the constructs measurement model exceeded the cut-off value of 0.5. All indicator variables measuring theoretical constructs have SFLs exceeding the cut off-value of 0.5. Such results indicate that the theoretical constructs in the measurement models have adequate convergent validity. The discriminant validity for the measurement model5 using Fornell Larcker Criterion is shown in the table 6.26. The AVEs of each construct are shown across the diagonal of the tables. These AVE values exceeded square of correlation between that construct and all the other constructs. Such results indicate that the constructs in the measurement model have adequate discriminant validity.

Table 6.26 : Discriminant Validity Results for Model5

	COG	REL	STR	COL
COG	0.881			
REL	0.682	0.938		
STR	0.592	0.726	0.876	
COL	0.655	0.808	0.782	0.966

Structural Model5:

The structural model5 developed with alternative blocks of indicators is shown in the figure 6.7. The structural model is estimated using the collected data.

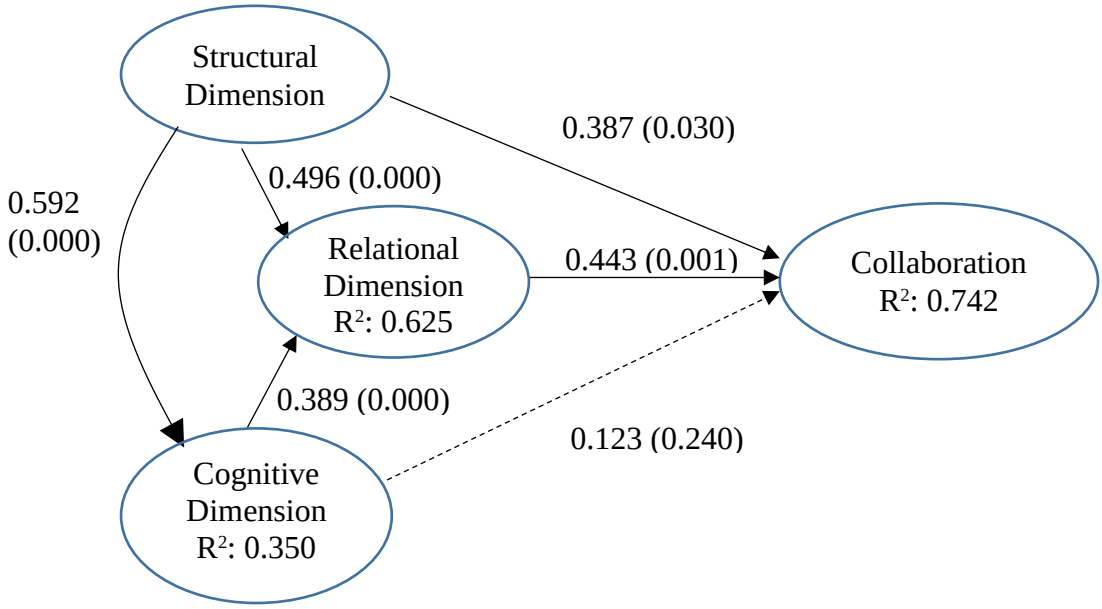

Figure 6.7 : Estimated Structural Model5

The estimated results for the above structural model shows a strong support for H1, H2, H3, H4 and H5 with path estimates of 0.496, 0.592, 0.389, 0.387 and 0.443 and P value less than 0.05. However, the relationship indicated by H6 in the structural model is not supported. The model fit results for the model5 is summarized in the table 6.27.

Table 6.27 : Model Fit Results for Structural Model5

Model Fit Criteria	Results of Analysis
Standardized Root Mean Square Residual (SRMR)	0.069
d_G	0.528 (P value = 0.286)
NFI	0.802

6.3.7 Results of PLS Assessment of Model6

Measurement Model6:

A fourth version of the model was developed using **non-network measures** for the structural dimension. It was estimated based the collected data using SmartPLS software tool. The validity of the measurement model was examined based on the results of the initial PLS estimation and the measurement model was improved through a similar procedure explained in Model1 previously. The modified measurement model is then re-estimated. The convergent validity and the construct reliability for measurement model is shown in the table 6.28.

Table 6.28 : Convergent Validity of Modified Measurement Model6

Construct	Internal Consistency		Indicator Reliability	
	Composite reliability (CR)	Average Variance Extracted (AVE)	Item	Standard Factor Loadings (SFL)
STR	0.873	0.775	STR_R_1	0.865
			STR_R_2	0.896
REL	0.907	0.829	REL_R_1	0.885
			REL_R_2	0.935
COG	0.888	0.799	COG_R_1	0.879
			COG_R_2	0.908
COL	0.977	0.934	COL1	0.951
			COL2	0.973
			COL3	0.974

As shown in the table 6.28, the CR value for constructs in measurement model exceeded the cut-off value of 0.7. Furthermore, AVEs estimated for all the constructs measurement model exceeded the cut-off value of 0.5. All indicator variables measuring theoretical constructs have SFLs exceeding the cut off-value of 0.5. Such results indicate that the theoretical constructs in the measurement models have adequate convergent validity. The discriminant validity using Fornell Larcker Criterion for the measurement model 6 is shown in the table 6.29. The AVEs of each construct are shown across the diagonal of the tables. These AVE values exceeded square of correlation between that construct and all the other constructs. Such results indicate that the constructs in the measurement model have adequate discriminant validity.

Table 6.29 : Discriminant Validity Results for Model6

	COG	REL	STR	COL
COG	0.894			
REL	0.715	0.911		
STR	0.766	0.628	0.880	
COL	0.707	0.716	0.640	0.966

Structural Model6:

The structural model6 developed with alternative blocks of indicators is shown in the figure 6.8. The structural model is estimated using the collected data.

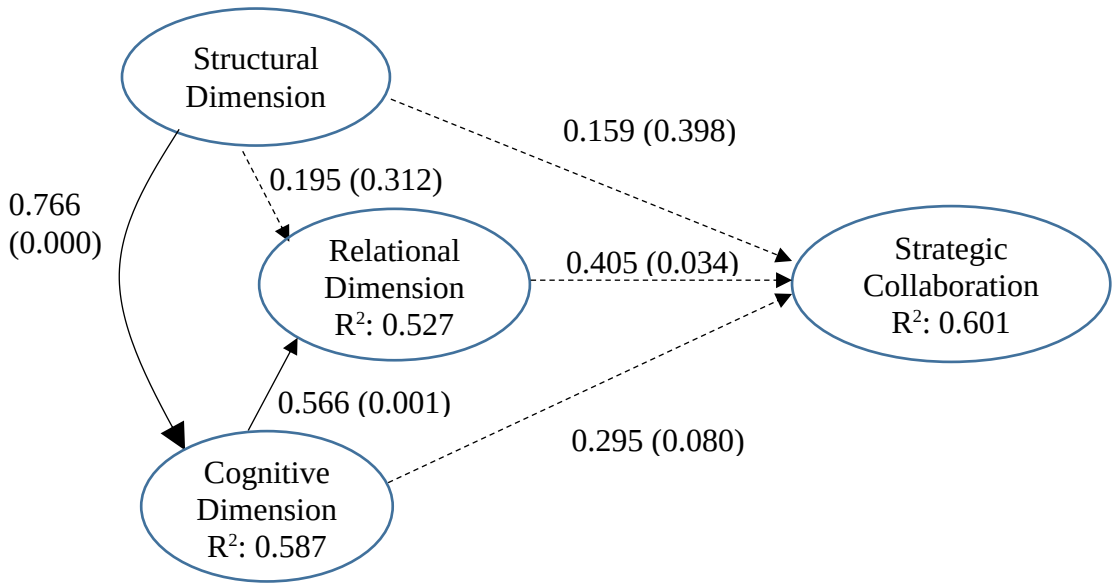

Figure 6.8 : Estimated Structural Model6

The estimated results for the above structural model shows a strong support for H2 and H3 with path estimates of 0.766 and 0.566 and P value less than 0.01. However, the relationships indicated by H2, H4, H5 and H6 in the structural model are not supported. The model fit results for the model6 is summarized in the table 6.30.

Table 6.30 : Model Fit Results for Structural Model6

Model Fit Criteria	Results of Analysis
Standardized Root Mean Square Residual (SRMR)	0.082
d_G	0.614 (P value = 0.053)
NFI	0.734

6.3.8 Comparison of Models and Discussion

The estimated results of PLS SEM analyses of all the models presented previously are summarized in the table 6.31. The highlighted figures indicate significant effects.

Table 6.31 : Comparison of PLS Results for Alternative Measurement Models

	Model1	**Model2**	**Model3**	**Model4**	**Model5**	**Model6**
Measure used for Structural Dimension	Betweenness Centrality	Total Degree Centrality	Eigen vector Centrality	Closeness Centrality	Effective Network Size	Non-network measures
STR>COL **(H4)**	**0.355 (0.025)**	**0.290 (0.011)**	0.236 (0.075)	0.252 (0.083)	**0.387 (0.030)**	0.159 (0.398)
REL>COL **(H5)**	**0.478 (0.000)**	**0.521 (0.001)**	**0.564 (0.000)**	**0.566 (0.000)**	**0.443 (0.001)**	**0.405 (0.034)**
COG> COL **(H6)**	0.137 (0.200)	0.123 (0.501)	0.120 (0.344)	0.092 (0.487)	0.123 (0.240)	0.295 (0.080)
STR>COG **(H2)**	**0.541 (0.000)**	**0.609 (0.000)**	**0.636 (0.000)**	**0.709 (0.000)**	**0.592 (0.000)**	**0.766 (0.000)**
STR>REL **(H1)**	**0.419 (0.004)**	**0.453 (0.001)**	**0.422 (0.011)**	**0.453 (0.001)**	**0.496 (0.000)**	0.195 (0.312)
COG>REL **(H3)**	**0.455 (0.000)**	**0.406 (0.000)**	**0.412 (0.001)**	**0.362 (0.001)**	**0.389 (0.000)**	**0.566 (0.001)**
R^2 of COL	**0.742**	0.713	0.699	0.699	**0.742**	0.601
R^2 of REL	0.590	0.593	0.570	0.569	0.625	0.527
R^2 of COG	0.292	0.371	0.405	0.503	0.350	0.587

6.3.8.1 Interrelations between Dimensions

The results of the PLS-SEM estimation reveal that there are strong interrelations among the structural, relational and cognitive dimensions of social capital, as expected. These results also compliment the findings of literature. For example, several

empirical studies attempted to identify the nature of these interrelations (Tsai and Ghoshal 1998, Zheng 2010, Camps and Marques 2014, Roden and Lawson 2014, Bstieler and Hemmert 2015). In the context of buyer–supplier relationship, the study Roden and Lawson (2014), investigates quantitatively the relationship between the structural (level of interaction) and cognitive (shared interest, shared values, and shared vision) dimensions on the relational dimension (trust, reciprocity, respect). The proposed relationships are found as significant. However, there is also contradictory findings in literature. For example, in a quantitative study of University-Industry Collaborations, Bstieler et al. (2015) tests the effect of certain facets of social capital in terms of shared governance (structural), trust (relational), and champion behaviour (cognitive) knowledge transfer and innovation performance. The structural dimension was found as influencing the relational one, however, the cognitive dimension moderates this relationship (i.e., the impact of shared governance on trust increases in the existence of high champion behaviour).

The positive association between structural dimension and relational dimension indicate that the social interactions in the higher management over a period of time or at a higher frequency may lead to identification with the other parties and result in increased trust between banks. An organization occupying a central location in the inter-organizational social interaction network is likely to be perceived as trustworthy by other organizations. The link between structural and relational dimension is also evident in the past literature. The structural dimension is found to supplement the relational dimension (Tsai and Ghoshal 1998, Bstieler, Hemmert et al. 2015). Earlier studies have suggested that trusting relationships evolve from social interactions (e.g. Granovetter 1985, Gulati 1995). In the IOR domain, the better the interpersonal communication between firms, the greater will be the relationship developed Hagedoorn (2006).

Also, there is a positive association between structural dimension and cognitive dimension. This means that social interactions play a critical role both in shaping and sharing common goals and values among members. The high level social interactions lead parties to share ideas and enable forming similar or collective perceptions. In the inter-bank domain, social interactions at the higher level contribute to the development

of mutual understandings, shared values and identification of common interests with other organizations. Banks may receive the motivation and influence to achieve the collective goals and standards such as in the case of shared systems and infrastructure. In the literature, a relatively less number of studies have empirically found that the structural dimension to be an antecedent for cognitive dimension (Van Maanen 1979, Krackhardt 1990).

Moreover, the findings suggest that there is a positive association between the cognitive and relational dimensions. In the inter-bank domain, organizations that shares the industry standards and goals are perceived as trustworthy by other organizations. Pre-existent, shared understandings make it easier for banks to trust each other. When two organizations share the same vision, interests, knowledge, and norms of work procedures, those organizations are already sharing the same foundation for establishing trust. There is evidence in the literature for similar findings that the relational and cognitive dimensions are highly correlated (Barber 1983, Zheng 2010). Trusting relationships are based on the compatibility of values (Sitkin and Roth 1993, Fukuyama 1995). Common values and beliefs erase the possibility of opportunistic behaviour (Ouchi 1980).

6.3.8.2 Effects of the of Social Capital on IOC

Overall, the results from the PLS-SEM assessment of the main model reveal that while both the structural and relational dimensions have significant positive effects on the degree of inter-organizational strategic collaborations as expected, the cognitive dimension's effect remain insignificant. This means that both the high level social connections between banks and the perceived trustworthiness of a bank within the network play an important role in successful formation of formal alliances between organizations (in this context). While, strong, high-level social connections in the immediate network may deliver information plus some degree of influence over an organization to engage in syndications, pre-existent trust supports the partner selection.

These results are also consistent with the findings of some **previous research that are closely comparable to this study**. The quantitative study conducted by Tsai and Ghoshal (1998) examines the influence of social interaction (structural), shared vision (cognitive), and trustworthiness (relational) towards the product innovation capability through resource exchange and find empirical support only for the structural and relational dimensions' effects. That study was focused on the intra-firm-level, considering the resource exchange between teams within the same firm. Moreover, Akhavan and Hosseini (2015) investigate the separate impacts of social interaction ties (structural), trust, reciprocity, team identification (relational), and shared goal (cognitive) on knowledge sharing. This empirical study of knowledge sharing between R&D teams of multiple organizations, found empirical support for the structural and relational dimensions, while the impact of cognitive impact emerged as insignificant. Accordingly, the effects of social capital dimensions on different forms of resource combination and exchanges at the intra- organizational level and at the inter-organizational level (i.e. inter-organizational collaborations, alliances, knowledge sharing) appear to be consistent and **a pattern seems to emerge**.

However, it is also notable that the strengths of the effects of structural and relational dimensions vary between studies. While the effects of structural and relational dimensions in the Tsai and Ghoshal's study are very small (i.e. 0.06 and 0.04), the results of the present study show stronger effects (i.e. 0.35 and 0.47). Also, the study of Akhavan and Hosseini reveal considerably strong effects (i.e. 0.20 for structural dimension and 0.22, 0.23 and 0.17 for separate relational aspects). The underlying reasons for such differences in strength of effects should be investigated in the future work considering factors such as contextual differences. While the first study was conducted in a developed country, Akhavan and Hosseini' study and the present study both draw from data obtained from developing contexts (Iran and Sri Lanka).

a) The Effect of Relational Dimension

In this study, the relational dimension was operationalized as 'trustworthiness' indicted by non-opportunistic behaviour, promise keeping and reputation based trust. The results of PLS analysis show that the 'trustworthiness' of an organization play an important role in its inter-organizational alliances compared to the effect of other

dimensions of social capital. Trust is an essential component when establishing long term alliances that involve high financial risks. In the case of long term inter-organizational partnerships, 'trustworthiness' is an essential element considered especially during the partner selection stage.

In the banking industry, which is inherently concerned with security, assessment of risk is a critical element in any collaborative activities. This is especially the case when it comes to long term partnerships with competitors. Banking organizations predominantly rely on their internal assessment of trustworthiness of potential partners due to fear of opportunistic behaviour. Pre-established trust between two parties could serve as a valuable resource that enables both parties to collaborate and explore opportunities together and minimise the costs of lengthy legal and formal processes. The results are consistent with the similar findings in previous research. For example, Tsai and Ghoshal (1998) modelled the relational dimension in a similar way and found that the 'trustworthiness' of a business unit is positively associated with its resource exchange and combination with other units. Akhavan and Mahdi Hosseini (2015) reveal that relational dimension characterized by trust, reciprocity and team identification has a positive impact on knowledge sharing intention.

b) The Effect of Cognitive Dimension

In this study, the cognitive dimension was operationalized as 'shared understandings' indicted by shared vision, share work understandings and shared market knowledge. The results reveal that the cognitive dimension does not significantly affect the formation of syndicate loan arrangements. This is contradicting the expectation based on the theoretical arguments presented in the Chapter 3, supporting the idea that the extent of shared understandings with other organizations will be positively associated with the degree of formal, long term inter-bank partnerships the firm involves in. This difference in the actual results and the expected results could be explained from two viewpoints. First, the effects of the cognitive dimension may be different in the banking domain, which relies significantly on regulatory constraints. Also, the particular type of alliance measured in this study may not rely on shared understandings and vision as much as other type of alliances, which may be the case in other types of partnerships such as joint ventures. Despite the

theoretical argument built in the Chapter 3 on how the cognitive dimension may positively influence the inter-organizational collaboration, the finding of this study is consistent with evidence from some previous research. The results of Tsai and Ghoshal (1998)'s study revealed that there is no significant relationship between cognitive dimension and the resource exchange and combination between organizations. According to Akhavan and Mahdi Hosseini (2015), the impact of cognitive dimension proxied by 'shared goal' on knowledge process emerged as insignificant.

c) The Effect of Structural Dimension

The structural dimension was reflected by social interactions between banking organizations including direct and indirect social ties between top management and participation in inter-organizational social events. The results reveal that the location of the firm in the inter-organizational social network has a positive impact on its ability to form formal inter-organizational alliances with other organizations in the domain. Significant influence of structural dimension has been previously emphasized by scholars. In a quantitative study at the intra-firm-level that examined the effects of structural (social interaction), cognitive (shared vision), and relational (trustworthiness), Tsai and Ghoshal (1998) revealed that the structural social capital enhances resource exchange pattern. Akhavan and Hosseini (2015) reveal the impact of social interaction ties (structural), on creating knowledge sharing intention.

d) Effects of Alternative Network Measures

Going deeper in to the structural dimension's effects, **several network locational properties** in the inter-organizational social networks have been explored in this study in order to identify which locational property best serves as a predictor of formal inter-organizational collaborations. The comparison of results of PLS estimations for models using different blocks of indicators for the structural dimension of social capital enable to identify which structural property in the inter-bank social interactions network serves as a better predictor of inter-organizational collaborations. The results suggest that three locational properties (betweenness, effective network size and degree centrality) produce significant positive effects towards the formal inter-organizational collaborations in varying degrees. For example, positive effect produced by the effective network size attest to the degree of structural holes in the

surrounding network has a positive effect in inter-organizational alliances. More structural holes mean more room for brokerage of information, resources and trust. Such organizations may harness the positional advantage towards forming formal collaborations. Other researchers also have provided similar evidence that there are differences in predictability of different centrality measures (Borgatti 2005, Hossain, Chung et al. 2007, Mutschke 2008, Gloor, Krauss et al. 2009). Although degree, betweenness, eigenvector and closeness, are all measure of an actor's prominence in a network (Wasserman 1994) that carry conceptually distinct meanings and calculations (Faust 1997, Valente and Foreman 1998).

According to the results of the PLS estimations for all the models, it is evident that **both the betweenness centrality and effective network size yield better results** in predicting the inter-organizational collaborations compared to other structural properties. Betweenness indicates the extent that a node is a broker of indirect connections among all others in a network, hence could be thought of as a gatekeeper of information flow. On the other hand, effective network size indicates the degree of structural holes in ego's network. A structural hole is understood as a gap between two nodes who have complementary sources to information. The idea of structural holes is such that, if one knows two disconnected other people, then he has the chance to broker a connection between them. Similarly, if one knows four disconnected people, then he has six opportunities to broker. Where a structural hole occurs between two disconnected people, then betweenness indicates the amount of structural holes a person has monopolistic access. Both measures therefore attempt to identify different forms of brokerage capacity of nodes. As such, both betweenness (Balkundi, Barsness et al. 2009, Creswick and Westbrook 2010, Di Marco, Taylor et al. 2010) and effective size (Cummings and Cross 2003, Heng, McGeorge et al. 2005, Susskind, Odom-Reed et al. 2011) measures have been commonly used as measures of 'brokerage' in the literature.

The benefits of brokerage are mainly based on the assumption that non-redundant actors are sources of unique information which provides social capital (Burt 1992). Brokers can facilitate access to novel information, or resources, facilitate transfer of knowledge, and co-ordinate effort across the network. In the inter-organizational

social network, organizations occupying broker positions enjoy considerable influential power stand better chances of bringing together partners that are otherwise unconnected, making them better candidates for bringing together others and leading alliances, especially in the case of multi-partner alliances. **Organizations with high Betweenness and higher effective network sizes in the inter-organizational social network, therefore, are the most strategically located to do better in inter-organizational alliances**. Organizations in broker positions are considered key players and their loss from a network would greatly affect its function and viability (Borgatti 2006). The brokerage roles involve benefits such as innovation, knowledge brokerage, and trust brokerage, controlled transfer of specialised knowledge between groups, increase cooperation by liaising, and improve efficiency by introducing 'good ideas' and costs such as gatekeeping of specialised knowledge or resources (Long, Cunningham et al. 2013). These results are also complimenting the results of certain previous research. Scholars have identified 'betweenness index' as the most suitable centrality measure for capturing the information or access benefits within a social structure (Tsai and Ghoshal 1998). Borgatti (2006) identified that the betweenness centrality measure is best suited for identifying individuals for the purpose of diffusing something through the network and for fragmenting the network by removing nodes on the other hand. The betweenanes centrality of individual customers has been positively related to opinion leadership in influencing the behaviour of the entire customer base (Lee, Cotte et al. 2010). Similarly, in a study of completely different domain (i.e. in pollination communities) Gonza´lez et. al. 2010 identified betweenness as a measure of the importance of a species as a connector.

6.3.8.3 Network Measures vs Non-Network Measures

The comparison between models using network measures and non-network measures enable identifying the potential of the network measures in predicting the inter-organizational collaboration over the non-network measures. While no support is found for effect of structural and cognitive dimensions when using non-network measures, the relational dimension yielded a positive significant effect. It is evident that the models using **network measures show better predictability**. The network measures enable to **conceptualize distinct strategic advantages associated with**

different locational properties such as brokerage, centrality and density towards inter-organizational collaborations. The network measures enable to capture specific locational properties in the inter-organizational social network such as ‘the informal power in brokering between other organizations in the network’, ‘the ability to quickly access the other organizations in the network’, ‘the density of connections in the local social network’ etc. contributing to very different capabilities and advantages based on the location. One way to characterize such distinctions among these constructs is in terms of how actors who occupy positions high on each type of centrality transmit influence to other actors in a network. Therefore, it is evident that the network science concepts provide a better toolkit to more accurately study the effect of social capital dimension in predicting the inter-organizational alliances.

6.4 Analysis 2: Tests of Moderation Effects

Once the empirical support for the main effects in the structural model had been found, a further analysis is carried out to identify what factors can strengthen (enablers) or weaken (inhibitors) the effect of three dimensions of social capital towards collaboration. Analysis of moderation effects was concerned with examining whether the defined structural model behaves differently in the presence of other external factors. Such analysis directly supports answering the third research question in this study, 'what other factors strengthen or weaken the effects of social capital towards collaboration?'

Different approaches of testing moderation are used depending on the data types of the available moderator variables. In moderator analysis, the main effects in the PLS path model is first estimated and, in a subsequent moderator analysis, include the product term to avoid the common mistake of confusing with main effects (Henseler and Chin 2010, Henseler and Fassott 2010, Hair, Ringle et al. 2013). Since there is theoretical support for multiple moderators, one moderator at a time is considered as suggested by Hair et al. (2013).

In the Chapter 3 of this thesis, number of moderating variables were identified that might influence a firm's ability to use social capital to develop strategic partnerships. Table 6.32 summarizes the potential moderators explored in this study. While the effect of ICT capability was analysed using interaction terms, the rest of the moderators were tested using multi group analysis.

Table 6.32 : Summary of Moderators Tested in this Study

Moderator Variable	Operationalized as
Overall ICT capability of firm	Number of ICTs used
Firm Size	Total Assets
Firm Age	Number of years since establishment
Previous Alliance experience	Number of banks with previous links
Gender Ratio of Director Board	Ratio of females: males in director board
Firm Ownership	Two groups: State, Non-state
Location of Firm Head Office in SL	Two groups: Colombo, Other
Firm Culture	Two groups: Foreign, Local
Organization Structure (Flatness)	Two groups: Standalone, Group

6.4.1 Firm-level ICT Capability

In this study, the moderation effect of ICT capabilities was tested through interaction terms using the Latent Variable Score Approach proposed by (Chin at el 2003) because this method is the most effective approach in identifying interaction terms in complex path models. Interaction moderation analysis was carried out using the SmartPLS. After estimating the baseline model, a new construct (ICT capability) was added to represent the interaction effect and this moderator was connected to the dependent construct using a dependency relationship. The results of the two models were compared using two PLS runs (Chin, Marcolin et al. 2003).

Figure 6.9 presents the estimated model including the ICT's interaction effects. Variance is explained and indicated for each construct as R2. The path coefficients are indicated numerically (from 0.000 to 1.000) on the paths between the two constructs, along with their significance (insignificant relationships are noted with dotted lines). Asterisks indicate significance levels: p < 0.05, 0.01, 0.001.

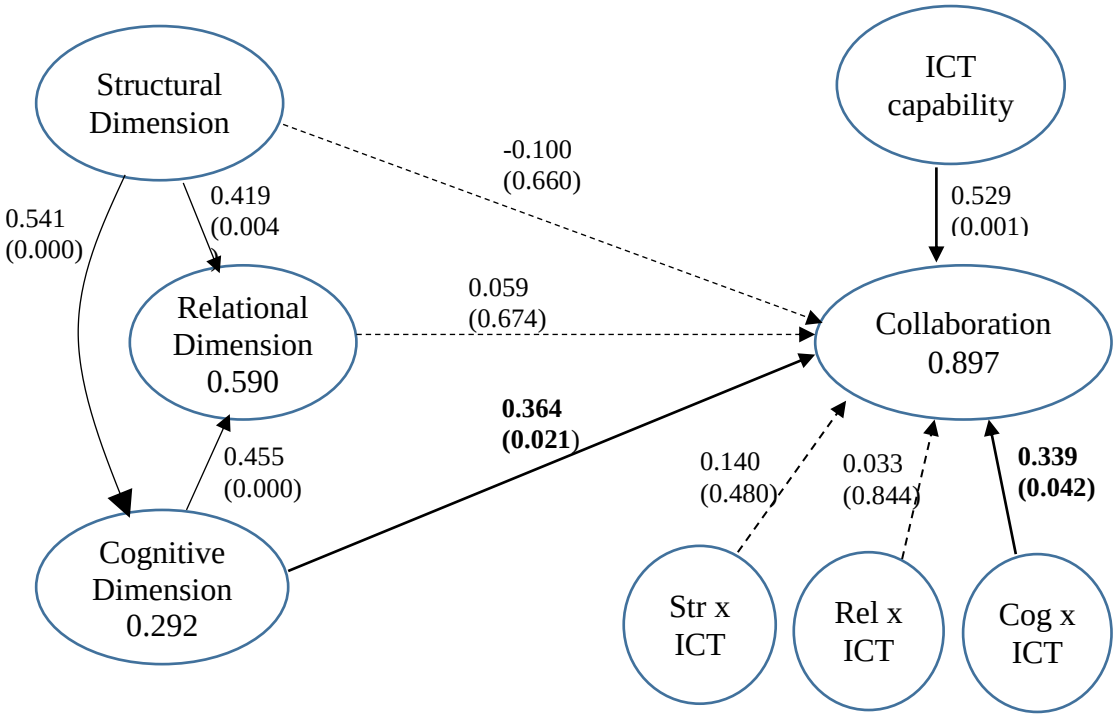

Figure 6.9 : Estimated Model Including ICT Capability as a Moderator

The results of PLS estimations of the original model (without ICTs effect) and the model with interaction effects of ICT are summarized in the table 6.33 and explained in the following section.

Table 6.33 : Comparison of PLS Results with and without ICT Capability

Path	Model without ICT Construct	Model with ICT Interactions
STR >COL	**0.355 (0.025)**	-0.112 (0.548)
REL >COL	**0.478 (0.000)**	0.053 (0.691)
COG > COL	0.137 (0.200)	**0.370 (0.031)**
STRxICT > COL	-	0.139 (0.432)
RELxICT >COL	-	0.028 (0.863)
COGxICT > COL	-	**0.343 (0.031)**
R^2 of COL	0.742	0.897

According to the results of PLS estimation in the initial model without including the interaction effects, both the structural and relational dimensions had significant positive effects (i.e 0.355 with p value = 0.025, 0.478 with p value = 0.000) on the collaboration. However, the effects of interaction terms (STR x ICT, REL x ICT) are insignificant with p values over 0.05 (i.e. 0.139 with p value = 0.432, 0.028 with p value = 0.863). This reveals that Overall ICT capability of organizations negatively influence both the Structural and Relational social cpaital's effects on inter-organizational collaboration.

Notably, the previously insignificant path coefficient (0.137, p value = 0.200) between cognitive dimension and collaboration became stronger and significant (0.343, p value = 0.031) when the interaction of ICT was added to the model. This significant interaction had an effect size of 0.291, showing a "medium" interaction effect. In interaction moderation, even small effects indicate important model relationships (Chin et al 2003).

Since the statistically significance of interaction term (COG x ICT) is established, the moderator hypothesis **H9** is supported. Sample means for each situation are then used to plot and visually demonstrate the interaction, that is, sample mean cognitive social capital scores for collaboration in the presence or absence of ICT capability.

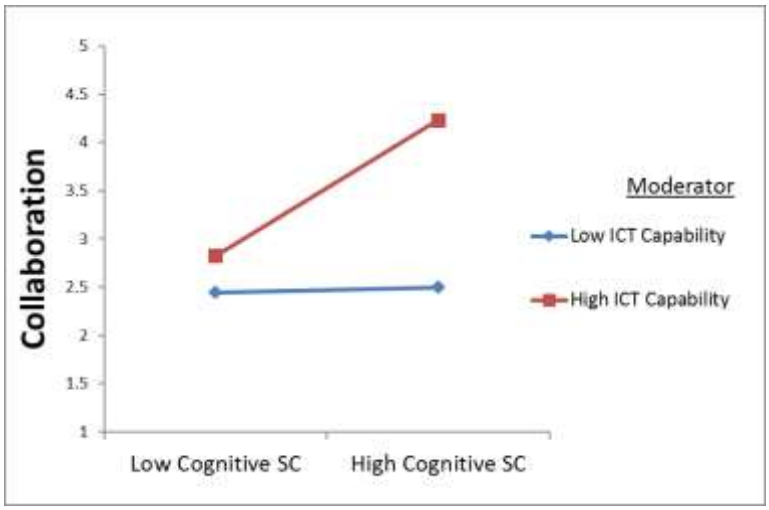

Figure 6.10 : ICT's Moderating Effect on the Link between Cognitive SC and Collaboration.

As shown in figure 6.10, the plotted graph reveal that the effect of cognitive social capital on inter-organizational strategic collaboration is higher when the ICT capability is higher. Therefore, ICT plays an important role in nurturing the role of cognitive social capital towards inter-organizational collaborations.

6.4.1.1 Moderating Effects of Different ICTs

Further to overall ICT capability, the moderating effects of different aspects of ICTs on the relationship between Structural (STR), Relational (REL) and Cognitive (COG) dimensions of Social Capital and Inter Organizational Collaboration (IOC) were separately tested using multi group moderation. For this, the categorical variables were transformed in to two values as 'high' and 'low' for each moderato ring variable.

To test the moderating effects of discrete variables, multigroup analysis is performed using SmartPLS in this research. When multiple moderators are theoretically supported, Hair et al. (2013) suggest considering one moderator at a time is considered to maintain interpretability of all results. PLS multigroup analysis is used to determine if the direct relationship between the exogenous latent variable and the endogenous latent variable in the PLS model significantly differs between groups (Henseler and Fassott 2010).

The first step of multi group moderation test is establishing data groups according to the grouping variable (moderator). For example, if the moderator is 'gender', two groups need to be established as male and female. Median splits were conducted in this study to dichotomize the moderator variables in to two-valued groups, (i.e. high and low).

The first SmartPLS run provides a report of path coefficients separately for each group, along with bootstrap-estimated standard deviations, t-values, and significance p values as well as confidence intervals. In the second phase, the PLS-MGA ('multi group analysis') feature provided in SmartPLS 3.0 is run. This feature enable comparing a model across two groups and identifying whether there is a significant difference between groups. This method is a non-parametric significance test for the difference of group-specific results that builds on PLS-SEM bootstrapping results. The PLS-MGA method is an extension of the original nonparametric Henseler's MGA method (Henseler, Ringle et al. 2009). A result is significant at the 5% probability of error level, if the p-value is smaller than 0.05 or larger than 0.95 for a certain difference of group-specific path coefficients.

A comparison of PLS-MGA results for different categories of ICTs are presented in the table 6.34. The cells representing significant difference are highlighted. It is followed by the table 6.35 which provides a summary of interpretation of PLSMGA results providing evidence that how different ICT capabilities act as enablers or inhibitors to the association between the three dimensions of social capital and inter-organizational collaboration. The highlighted cells represent significant moderation effects.

Table 6.34 : Comparison of PLS-MGA Results (Different ICT Capabilities)

COG > IOC		REL > IOC		STR > IOC		**Path**
HIGH	LOW	HIGH	LOW	HIGH	LOW	**Group**
0.236 (0.052)	0.102 (0.743)	**0.540 (0.000)**	0.283 (0.297)	**0.295 (0.043)**	0.404 (0.270)	**Communication Tools**
0.134 (0.693)		**0.257 (0.951)**		0.109 (0.431)		Statistical Significance of Difference
0.525 (0.037)	0.011 (0.938)	0.186 (0.425)	**0.445 (0.043)**	0.220 (0.458)	**0.559 (0.026)**	**Internal Software**
0.514 (0.025)		0.259 (0.799)		**0.339 (0.831)**		Statistical Significance of Difference
0.656 (0.000)	0.167 (0.607)	**0.298 (0.008)**	0.243 (0.555)	0.112 (0.623)	0.040 (0.916)	**Social Media**
0.489 (0.047)		0.055 (0.434)		0.072 (0.457)		Statistical Significance of Difference
0.563 (0.053)	-0.069 (0.721)	0.133 (0.625)	**0.780 (0.000)**	0.241 (0.554)	**0.412 (0.023)**	**ICT - HR**
0.632 (0.021)		**0.647 (0.966)**		0.171 (0.684)		Statistical Significance of Difference
0.197 (0.050)	0.312 (0.525)	**0.486 (0.007)**	0.465 (0.322)	0.294 (0.188)	-0.005 (0.993)	**Shared Systems**
0.115 (0.041)		**0.021 (0.049)**		0.299 (0.687)		Statistical Significance of Difference

Table 6.35 : Interpretation of PLS-MGA Results (Different ICT Capabilities)

Type of ICT Capability	Structural Dimension (STR)	Relational Dimension (REL)	Cognitive Dimension (COG)
Use of Communication Tools	None	**Significantly Moderate (Enabler)** *The effect of REL on IOC is stronger for organizations using higher levels of Communication Tools*	None
Use of Internal Banking Software	None	None	**Significantly Moderate (Enabler)** *The effect of COG on IOC is stronger for organizations using more Internal Banking Software*
Use of Social Media	None	None	**Significantly Moderate (Enabler)** *The effect of COG on IOC is stronger for organizations using more Social Media*
Availability of In-house ICT HR	None	**Significantly Moderate (Inhibitor)** *The effect of REL on IOC is weaker for organizations with high levels of ICT related human resources*	**Significantly Moderate (Enabler)** *The effect of COG on IOC is stronger for organizations with higher levels of ICT related human resources*
Participation in Shared Banking Systems	None	**Significantly Moderate (Enabler)** *The effect of REL on IOC is stronger for organizations that participate more in inter-bank shared systems*	**Significantly Moderate (Enabler)** *The effect of COG on IOC is stronger for organizations that participate more in inter-bank shared systems*

The theory proposed in this study conceptualize that the relationship between social capital and collaboration was positively moderated by ICT capability of organizations. In other words, the higher the ICT capability of a firm, the more the firm's level of collaboration will be affected by social capital. The results revealed existence of a significant interaction between social capital, ICT capability and collaboration in the

model. Comparison of the models with and without the ICT construct, shows that the inclusion of ICT in to the model increased the predictability (R^2) of inter-organizational collaboration from 0.758 to 0.897. The hypothesis that the influence of social capital on firm collaboration is moderated by ICT capability was therefore confirmed.

General Discussion: Overall, the ICT capability of banking organizations seems to have a strong positive effect on the level of the firm's strategic collaboration. ICT capability not only enables organizations to process, search for, and disseminate information faster, but also makes organizations more attractive in partner selection. When the use of ICT increases, the communication and flow of information becomes faster, increasing accessibility and visibility for all, with or without personal links or contacts. These findings seem to agree with the findings of previous studies in this line of inquiry. Firm-level ICTs have been linked to high levels of information sharing (Cannon and Perreault Jr 1999), greater interfirm cooperation and to reduced uncertainty (Bensaou 1997, Subramani 2004), closer buyer-supplier relationships (Bakos and Brynjolfsson 1993, Stump and Sriram 1997), commitment to establishing relational behavior (Grover, Teng et al. 2002) and other organizational benefits (Subramani 2004). Moreover, the use of social network services is found to be strongly associated with the formation and maintenance of social capital (Alessandrini 2006, Ellison, Steinfield et al. 2007). Technological skills and managerial capabilities have been associated with guanxi development in Chinese firms (Park and Luo 2001). Kim et al (2016) found that the use of social media in disaster recovery, correlates positively with the perceived level of organizational resilience and community emotional responses.

ICT's Effect on Cognitive Dimension: The presence of high levels of ICTs significantly strengthened the cognitive dimension representing 'cognitive proximity', which did not have a significant effect on its own in the initial model. Therefore, the hypothesis **H9** is supported. The availability of shared communication protocols and shared ICT infrastructure enables organizations to develop strong shared understandings and directions. Accordingly, organizations tend to select those partners

with shared ICT infrastructure and systems, when forming future alliances and collaborations.

This is complementing the findings in literature on ICT-based 'quick connect capability', meaning that shared knowledge, standards and ICT together enable to form inter-organizational links in a very short time (Vervest, Preiss et al. 2004, Chatterjee and Ali 2006, Hoogeweegen, van Liere et al. 2006, Van Liere, Hoogeweegen et al. 2006). Such quick connect capabilities make it easier to establish inter-organizational relationships. Chae et al (2005) identified that IT reinforces and stabilizes the already existing inter-organizational structures and arrangements. Cannon and Perreault (1999) suggest that successful inter-organizational relationships are associated with high levels of information sharing. Also, shared cognition, also strengthened by ICT, enables organizations to communicate effectively. Effective communication is importance in inter-organizational relationships (Mohr, Fisher et al. 1996).

ICT's Effect on Structural Dimension: It is also interesting to see that overall ICT capability does not have a significant interaction effect on inter-organizational alliances when combined with structural dimension represented as inter-organizational social interactions, failing the hypothesis **H7**. This result could be attributed to the characteristics specific to the banking domain. In banks, a higher ICT level may not enable social interactions with external parties due to the regulatory and security constraints. Rather the ICT level may restrain inter-organizational social interactions in this domain unlike in other domains as ICTs may pose more challenges and risks in the banking industry due to the regulation, compliance and security concerns are paramount.

ICT's Effect on Relational Dimension: It is speculative that the relational dimension resembling trustworthiness is also not strengthened with overall ICT capability failing the hypothesis **H8**. Although the ICT capability of a bank may increase its attractiveness and trustworthiness as a potential partner in general, due to increased information security and standards, ICT capability may not play a significant role in the domain of syndication partnerships, which was the focus of this study. It is reasonable to believe that ICT would strengthen the relational dimension's effect in

any other type of inter-organizational collaboration such as ICT infrastructure sharing agreements between organizations and inter-organizational joint ventures. Such effects could be explored in future research.

Results of the moderation effect of separate ICT capabilities: The researcher further tested for mediating effect of different aspects of ICT capabilities on the influence of social capital on firm collaboration on an exploratory basis and the tests yielded positive results for moderation effects. Results show that the model behaved differently for different ICT capabilities such as Communication Tools, Internal Banking Systems, Social media, Participation in inter-bank shared systems and ICT Human Resources.

The PLS MGA identified statistically significant differences in the model for each of the ICT aspect investigated. Specifically, it is evident that the structural dimension's effect is not strengthened by any aspect of ICTs examined in this analysis.

The relational dimension's effect on inter-organizational collaboration is significantly strengthened by ICT Communication tools and ICT Human Resources, and by the participation in inter-bank Shared ICT systems. This means the effect of trustworthiness on inter-organizational alliances is strengthened by communication technologies and through the participation in inter-bank shared ICT infrastructure.

Importantly, the cognitive dimension's effect is significantly strengthened by many of the firm-level ICT capabilities, namely, Internal banking software, Social media use, ICT human resources and Inter-bank shared ICT systems. This effect on cognitive dimension is visible in the higher-level analysis which was presented previously with the moderation effect of overall ICT capability.

6.4.2 Other Moderators

In this study, a number of other firm-level factors that might influence a firm's ability to use social capital to develop strategic partnerships were identified and tested through multi group moderation in this research. These factors are: Firm size, Age, Gender Ratio of Director Board, Ownership, Location, Geographical Spread, Culture, Number of Countries, Organization Structure, and Previous Experience.

To test the moderating effects of these theoretically supported moderator variables, multigroup analysis (PLS-MGA) is performed using SmartPLS in this research. This procedure helps to determine if the direct relationship between the exogenous latent variable and the endogenous latent variable in the PLS model significantly differs between groups. The same procedure described in the previous section in relation to the test of moderating effects of different ICT capabilities is followed here. Median splits were conducted in this study to divide the moderator variables in to two-valued groups (i.e. high and low). For each variable, two PLS runs were performed. First, the bootstrapping run provided separate estimations for both groups. Second, the MGA run provides statistical evidence for the differences. As given above, s result is significant at the 5% probability of error level, if the p-value is smaller than 0.05 or larger than 0.95 for a certain difference of group-specific path coefficients.

6.4.2.1 Results of MGA Tests:

For each of the moderator variables, to test the significance of difference between groups, t-statistics was calculated. The differences in the path coefficients between groups are summarized in the table given below. Such an evaluation is useful to understand which individual relationships are being moderated. The results are presented in the table 6.36 below. The highlighted figures in the table shows the significant findings of moderation tests.

Table 6.36 : Comparison of PLS MGA Results (Other Firm-level Factors)

Moderator	Original Model	Size		Age		Gender Ratio		Ownership		HO Location
Data Groups	-	Large	SnM	Old	Young	High	Low	State	Private	City Area
R^2 of COL	0.742	0.777	0.799	0.687	0.933	0.675	0.857	0.800	0.750	0.684
STR> COL (H4)	**0.355 (0.019)**	0.355 (0.148)	**0.827 (0.002)**	0.240 (0.369)	**0.714 (0.000)**	0.109 (0.814)	**0.526 (0.004)**	0.310 (0.454)	**0.420 (0.031)**	0.309 (0.143)
Statistical Difference	-	**0.471 (0.042)**		**0.474 (0.956)**		**0.416 (0.951)**		0.110 (0.548)		0.357 (0.811)
REL> COL (H5)	**0.478 (0.000)**	0.233 (0.335)	0.157 (0.667)	0.262 (0.237)	**0.276 (0.037)**	0.576 (0.167)	**0.427 (0.040)**	0.580 (0.087)	**0.382 (0.053)**	**0.443 (0.005)**
Statistical Difference	-	0.076 (0.558)		0.014 (0.479)		0.149 (0.302)		**0.198 (0.051)**		0.162 (0.343)
COG> COL (H6)	0.137 (0.227)	**0.407 (0.030)**	-0.094 (0.711)	**0.431 (0.050)**	0.029 (0.829)	0.194 (0.343)	0.147 (0.382)	0.097 (0.758)	0.160 (0.230)	0.210 (0.154)
Statistical Difference	-	**0.501 (0.954)**		**0.402 (0.037)**		0.092 (0.644)		0.063 (0.628)		0.147 (0.224)

	Other	0.922	0.666 (0.223)		0.281 (0.686)		0.063 (0.944)	
Culture	Foreign	0.868	0.640 (0.148)	0.298 (0.322)	0.100 (0.821)	**0.438 (0.032)**	0.297 (0.340)	0.243 (0.558)
	Local	0.749	0.342 (0.153)		**0.538 (0.044)**		0.054 (0.798)	
Organization structure	Low	0.779	0.299 (0.230)	**0.396 (0.048)**	0.313 (0.200)	0.163 (0.565)	0.358 (0.085)	0.157 (0.178)
	High	0.860	**0.695 (0.025)**		0.150 (0.605)		0.201 (0.385)	
Previous Experience	Low	0.557	**0.595 (0.026)**	**0.429 (0.041)**	**0.499 (0.015)**	**0.332 (0.037)**	0.135 (0.143)	**0.464 (0.021)**
	High	0.696	0.166 (0.524)		0.167 (0.387)		**0.599 (0.005)**	

The PLS MGA results for the firm-level factors yielded that Firm size, Age, Gender Ratio of Director Board, Ownership, Geographic Spread, Culture, Organization Structure and Previous Alliance Experience significantly moderate the influence of social capital on degree of strategic collaboration. Out of these factors, the structural dimension was affected by firm size, age, gender, geographical spread, organizational structure and previous alliance experiences. The relational dimension was affected by firm ownership, culture and previous alliances. The cognitive dimension was affected by firm size, age, geographical spread and previous alliance experience.

Table 6.37 presents a summary of the interpretation of identified moderating effects. The highlighted cells represent significant moderation effects identified through significant statistical differences between groups.

Table 6.37 : Interpretation of PLS-MGA Results (Other Firm-level Factors)

Firm-level Factor	Structural Dimension (STR)	Relational Dimension (REL)	Cognitive Dimension (COG)
Firm Size	**Inhibitor** *The effect of STR on IOC is weaker for bigger organizations*	None	**Enabler** *The effect of COG on IOC is stronger for larger organizations*
Firm Age	**Inhibitor** *The effect of STR on IOC is weaker for older organizations*	None	**Enabler** *The effect of COG on IOC is stronger for older organizations*
Gender Ratio of Director Board (Females: Males)	**Inhibitor** *The effect of STR on IOC is weaker for organizations with higher F:M ratio*	None	None
Firm Ownership	None	**Moderator** *The effect of REL on IOC is stronger for private organizations*	None
Head Office Location	None	None	None
Geo Spread of branches	**Inhibitor** *The effect of STR on IOC is weaker for organizations with more geographic spread*	None	**Enabler** *The effect of COG on IOC is stronger for organizations with more geographic spread*
Culture	None	**Moderator** *The effect of REL on IOC is stronger for local organizations*	None
Number of Countries	None	None	None
Degree of Organization structure	**Enabler** *The effect of STR on IOC is stronger for organizations with more layered structures*	None	None
Previous Alliance Experience	**Inhibitor** *The effect of STR on IOC is weaker for organizations with more previous experience*	**Inhibitor** *The effect of REL on IOC is weaker for organizations with more previous experience*	**Enabler** *The effect of COG on IOC is stronger for organizations with more previous experience*

The following sections discuss the results of moderation test for each moderator.

Firm Size: The firm size was operationalized as the total assets. The analysis shows that the model behaved differently across 'large organizations' and 'smaller organizations'. For the smaller organizations, the effect of **structural** dimension on collaboration is significant with a path coefficient of **0.827 (p=0.002)**. However, the relational and cognitive dimensions don't show a significant effect for this group. For larger organizations, the effect of the cognitive dimension is significant with a path coefficient of **0.407 (p=0.030)**. the PLS MGA shows that the path from structural dimension to the collaboration is statistically differs by **0.471 (p=0.042)** between the two groups. The path between the cognitive dimension shows a difference of **0.501 (p=0.954).** Therefore, it can be concluded that the firm size has a significant moderating effect on the relationship between social capital and inter-organizational collaboration. While for larger organizations, only the cognitive social capital (shared understandings) has a strong effect on inter-organizational collaboration, only the structural social capital (social ties) has a strong effect on inter-organizational collaboration of smaller organizations.

Firm Age: The analysis also shows the model behaved differently between 'older' and 'younger' groups of organizations. For the group with younger organizations, there is a strong significant effect from structural dimension with a path coefficient of **0.714 (p=0.000)** and the effect of relational dimension is also significant **(p=0.037)** with a path coefficient of **0.276.** However, for young organizations, the effect of cognitive dimension is insignificant. For older organizations, the effect of cognitive dimension towards collaboration is significant with a path coefficient of **0.431 (p=0.050)**. for this group, the structural and relational dimensions do not seem to have an effect on collaboration. The PLS MGA shows that, the difference in the path between structural dimension and collaboration between the two groups is statistically significantly by **0.474 (p=0.956).** Also, the difference in path between the cognitive dimension and collaboration is statistically significant by **0.402 (p=0.0.037).** Therefore, it can be concluded that the firm age has a significant moderating effect on the relationship between social capital and inter-organizational collaboration. While for older organizations, the cognitive social capital (shared understandings) has a stronger effect on inter-organizational collaboration, for younger organizations, the structural social capital (social ties) has a stronger effect on inter-organizational collaboration. This

reveals that while younger organizations rely on social contacts and interactions in partnerships, older organizations rely simply on their shared understandings built over a long period of time.

Gender Ratio of Director Board: The structural model also behaved differently according to the ratio of gender (females / males) in the director board. In organizations with lower female: male ratios, both structural (**0.526, p=0.004)** and relational (0**.427, p=0.040)** dimensions strongly affected the inter-organizational relations. None of the social capital dimensions yielded significant effects in the group with higher female: male ratios in director boards. The PLS-MGA shows the difference (0.416) in the path between structural dimension and inter-organizational collaboration is significant across the two groups (p=0.951). Accordingly, it is evident that gender of directors may have an impact on the firm's structural social capital in terms of inter-organizational social connections. Specifically, the more males in the director board, stronger the structural social capital's effect on inter-organizational partnerships. The gender may affect the firm's strategic decisions on inter-bank partnerships.

Firm Ownership: The group comparison between the government owned organizations and non-government organizations shows a significant difference between. For the non-government organizations, there is a strong significant effect from **structural dimension** on collaboration with a path coefficient of **0.420 (p=0.031)** while there is a marginally significant effect of 0.382 (p=0.053) from relational dimension. There is no significant effect from cognitive dimension for this group. For government organizations, all three dimensions do not show any significant effect on the inter-organizational collaboration. This finding reveals the fact that, while private organizations that are facing more volatility and uncertainty compared to the government organizations that are under the government protection, may rely more on social capital as a resource for their dealings with other organizations. The PLS MGA results show that only the difference (0.198) in the relational dimension to be statistically significant (p=0.051)

Location of Head office: It was also examined whether the head office location has any moderating effect on the observed structural model. The organizations were

divided to two groups as those located in a popular, commercial area and those located elsewhere. The comparison shows that the structural model behaved differently across the two groups. For the organizations located in the commercial city, there was a significant effect from relational social capital towards their inter-organizational relations (**0.443, p=0.005).** For the organizations with head offices located in other cities, non-of the social capital dimensions show any effect on their inter-organizational relations. This result implies that the geographical location can positively effect trust building between organizations perhaps through increased accessibility and frequent social interactions. However, the PLS-MGA shows these differences are not significant (0.162, p=0.343). This a significant finding, highlighting that social capital within a localised environment could facilitates the formal connections between organizations. This result also compliments the studies attesting to the spatially bounded nature of social capital (Monge and Contractor 2003, Tura and Harmaakorpi 2005).

Geographic Spread: The organizations were grouped according to their geographic spread of branches across nine provinces within the country. Those organizations having branches in all provinces were grouped together while others were put into another group. The comparison of model across two groups that there is a strong effect from **structural** dimension towards collaboration in the group of organizations having less geographic coverage (**0.713, p=0.018).** There was no effect from structural dimension in the case of organizations with high geographic coverage. Also, there was a significant effect from **cognitive** dimension towards collaboration (**0.577, p=0.008)** for the group with high geographical coverage, whereas there was no effect from cognitive dimension in the other group. The PLS MGA results show that the differences in the structural dimension (0.437, p= 0.037) and the cognitive dimension (0.410, p=0.047) to be statistically significant. This finding reveals that firm with less geographic reach tend to rely more on their high level social connections for forming partnerships with other organizations. On the other hand, those organizations with high geographical coverage rely more on shared understandings with other organizations when it comes to formal partnerships.

Firm Culture: The group comparison between local organizations and foreign organizations shows that the structural model behaves differently for the two groups. For foreign organizations, there was no significant effect from any of the social capital dimensions towards collaboration. However, for local organizations, the **relational dimension's** effect on collaboration was strong and significant (**0.538, p=0.044)**) while the other two dimensions did not yield a significant effect. However, the PLS MGA show that this difference in the path from relational dimension towards collaboration is significant between the two groups (0.438, p =0.032). This finding reveals the tendency of local culture to rely on relational social capital in formal inter-organizational dealings. This trend is not visible with regard to the foreign organizations with multicultural traits.

Number of Countries: In the same line of thought, the culture was also operationalized through the number of countries an organization has its presence in. Two groups were identified as 'organizations with multi-cultural exposure' and 'those only located in single country'. This analysis shows that the path between structural dimension and collaboration behaved differently across two groups. The effect of structural dimension was strong (**0.558, p= 0.004**) for the first group, whereas the other dimensions were not significant. For the second group, none of the dimensions yielded a significant effect on inter-organizational relations. The PLS MGA results however suggest that this difference in the structural dimension is not statistically significant across the two groups (**0.325, p=0.160)**.

Organization Structure: The structural model also behaved differently with the differences in organization structure of the organizations. In the case of organizations with lower hierarchy, the social capital's effect towards inter-organizational collaboration was not significant. This group included the standalone banking organizations not belonging to a broader group or mother company. In the case of organizations that belonged to a larger hierarchy (group or mother company), there was a significant positive effect (0.695, p=0.025) from **structural social capital** towards inter-organizational collaborations. The PLS-MGA shows this difference in the path from structural dimension to collaboration is significant (0.396, p=0.048) across the two groups. In hierarchical organizational structures, communication and

decision making often face obstacles and takes longer compared to flat structures. This reveals the effect of social ties is more prominent in decision making such as during partner in the organizations with hierarchical structures.

Previous Alliance Experience: lastly, the organizations were grouped according to the availability of previous alliance experience. The two groups produced different results in the group comparison. Firstly, the structural dimension's effect was stronger for the 'low experienced' group (0.595, p=0.026) compared to its effect on the 'high experienced' group (0.166, p=0.524). Similarly, the group with low experiences yielded stronger effects from relational dimension as well (0.429, p=0.041) compared to the other group (0.167, p=0.387). However, the cognitive dimension's effect increased from (0.135, p=0.143) to (0.599, p=0.005) across 'low experience' to 'high experience' groups. The PLS-MGA results shows these differences in the three paths, namely from structural (0.429, p=0.041), relational (0.332, p=0.037) and cognitive (0.464, p=0.021) towards collaboration to be significant. This is a significant finding, that suggests it is likely that new forms of social capital are created as a by-product of previous partnerships development (see also :Tsai 2000, Koka and Prescott 2002, Vissers and Dankbaar 2016).

6.5 Analysis3: Model Extensions

6.5.1 Extension 1: Social Capital and Performance

A further analysis was carried out to investigate whether there is any direct effect from social capital dimensions towards firm performance. The structural model was adjusted to directly link social capital dimensions with firm performance by removing the 'collaboration' construct from the original model. Bank financial performance has been operationalized using financial ratios in this study; return on equity (ROE), return on assets (ROA), net interest margin (NIM). The estimated model is given in the figure 6.11.

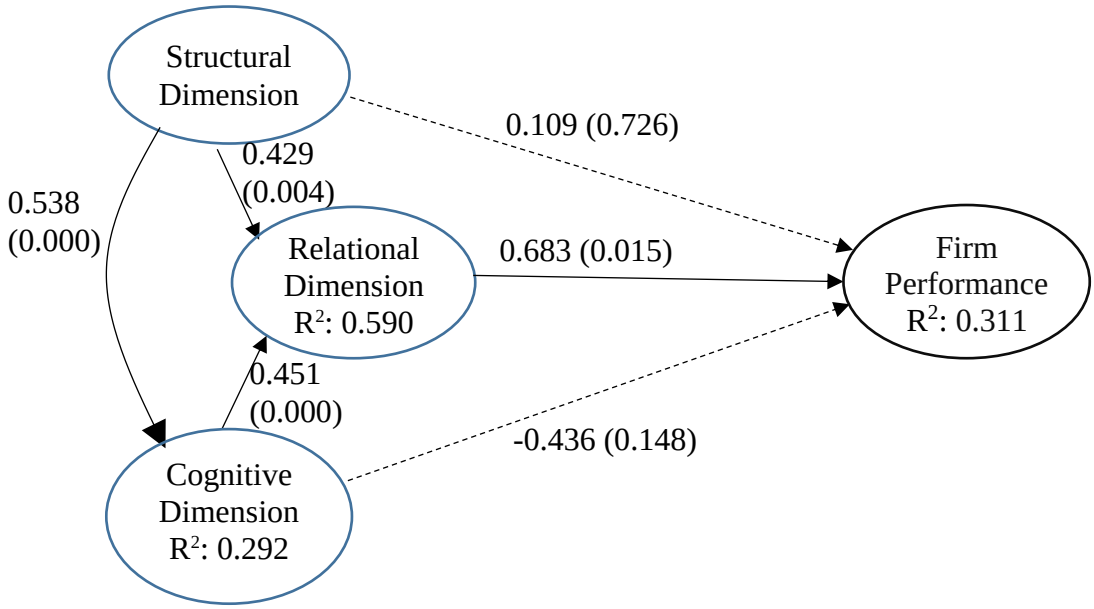

Figure 6.11 : Model of SC and Performance

The results suggest that there is a strong positive effect from relational dimension of social capital towards the firm performance with a path coefficient of 0.683 and a p value of 0.015. The coefficient of determination (R2) of performance is much higher compared to the previous model where performance was predicted from the inter-organizational strategic collaboration. Therefore, the hypothesis **H17** on the effect of social capital on the performance is supported.

This results compliment the other studies that found Social capital to promote increased performance in organizations through enabling access to information (Burt 1992, Burt, Nohria et al. 1992, Adler and Kwon 2002) ; resources (Tsai and Ghoshal 1998, Peng and Luo 2000, Acquaah 2007), knowledge (Dyer and Nobeoka 2000, Yli-Renko, Autio et al. 2001), opportunities and increased human capital (Baldwin, Bedell et al. 1997, Reed, Lubatkin et al. 2006, Cabello-Medina, López-Cabrales et al. 2011, Ogutu, Obonyo et al. 2015) thereby increasing firm's capabilities to exploit knowledge, reduce operations cost, provide superior service.

6.5.2 Extension 2: Social Capital, IOC and Performance

The model of social capital and inter-organizational collaboration was extended to investigate the value creation in terms of firm performance. Here, the IOC refers to the syndication alliances that an organization is involved (same as initial model). As argued in the Chapter 3 of this thesis, the inter-organizational alliances are expected to yield better financial performance for the individual organizations.

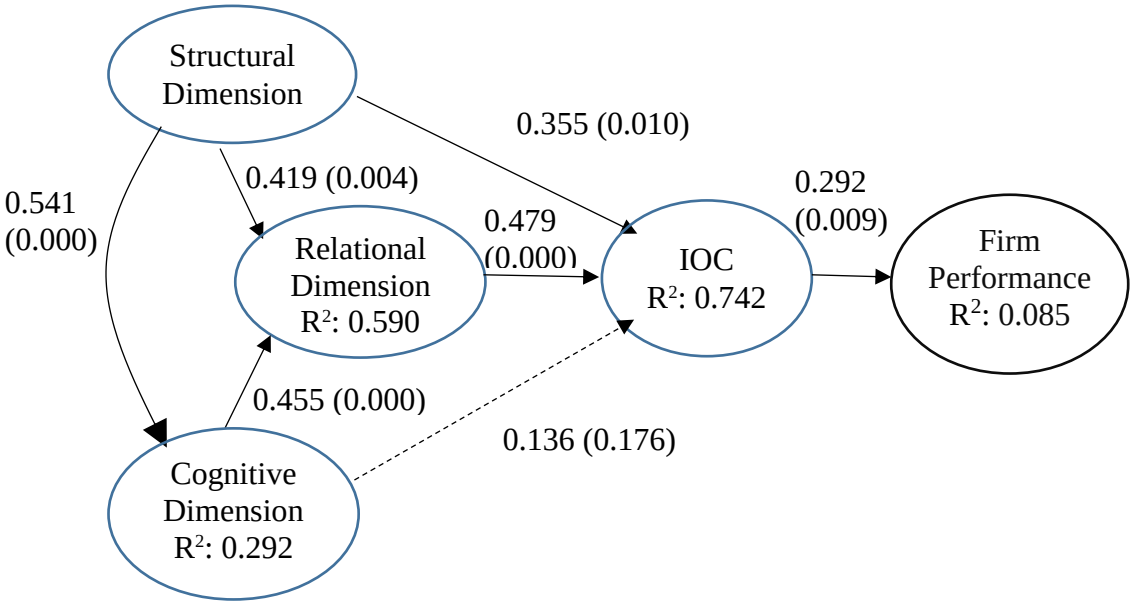

Figure 6.12 : Model of SC, IOC and Performance

The extended model was estimated based the collected data using SmartPLS software tool. The PLS SEM analyses shows that indicators NIM (SFL=0.127) and ROA (SFL=0.267) did not show adequate loadings to the 'performance' construct.

Therefore, those two indicators were removed and the construct was measured only using ROE. The modified measurement model is then re-estimated. The convergent validity and the construct reliability for measurement model was established with CR values exceeding the cut-off value of 0.7 and all indicators measuring theoretical constructs having SFLs exceeding the cut off-value of 0.5. The discriminant validity for measurement model was established with AVE values exceeding the square of correlation between that construct and all the other constructs.

The estimated structural model is shown in the figure 6.12. The significant paths are indicated with think lined arrows pointing to the direction of causality. The dashed lines represent insignificant paths. The labels on tops of the arrows contain path coefficient and p value within brackets. The coefficient of determination (R2) is given within respective ellipses.

The results for the above structural model shows a significant effect from collaboration to firm performance with a path coefficient of 0.292 and a p value of 0.009. Therefore, the hypothesis **H18** that inter-organizational collaboration to have a positive effect on firm performance is supported. However, the R^2 for 'performance' is only 0.085 indicating a very low predictive power in explaining performance through inter-organizational collaboration.

This result complements the previous literature that found a link between inter-organizational networks and firm performance. For example, importance of inter-organizational interaction has been associated with creation and diffusion of innovations (e.g., Ghoshal, Korine, & Szulanski, 1993; Ibarra, 1993; Leonard-Barton & Sinha, 1992; Powell, Koput, & Smith-Doerr, 1996). Further, the processes of resource exchange and combination is associated with innovation (Ibarra 1993, Ghoshal, Korine et al. 1994, Powell, Koput et al. 1996). Uzzi (1996, 1997, 1999, 2005) identified that embedded ties can produce competitive advantages.

6.5.3 Extension 3: Social Capital, Strategic IOC and Performance

Another version of the model was built using different set o f indicators measuging the inter-organizational collaboration, in order to investigate the effect of social capital on inter-organizational collaboration at a more general level. Here, the latent construct **'strategic collaboration'** was measured using two types of long-term inter-organizational collaborations: i.e. the centrality in **syndication alliances** network as well as the centrality in **equity sharing network**. As a further value creation, the link between the strategic collaboration and firm performance is also investigated here. The estimated model is given in the figure 6.13.

The results suggest that there are **strong positive effects from all three dimensions** of social capital towards the degree of inter-organizational strategic collaboration of a firm. Out of the structural, relational and cognitive dimensions, the structural dimension representing inter-organizational social relations has the highest effect on overall inter-organizational strategic collaboration. Unlike in the initial model that only focused on inter-organizational alliances, the cognitive dimension of social capital representing shared understandings between organizations is now producing a significant effect.

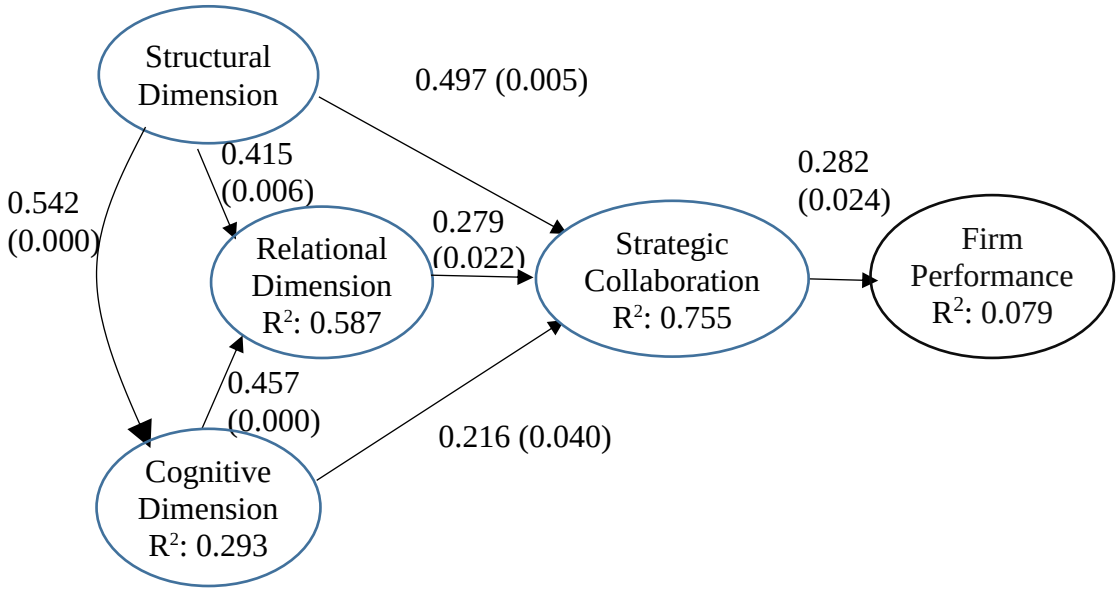

Figure 6.13 : Model of SC, Strategic Collaboration and Performance

The degree of overall strategic collaboration of an organization is also positively associated with the firm performance with a path coefficient of 0.282 and a p value of 0.024. However, the coefficient of determination (R2) of performance is very small with a value of 0.079. Therefore, it can be concluded that social capital act as a resource that drive inter-organizational collaborations leading to increased firm performance.

6.5.4 Extension 4: Social Capital and CSR of Organizations

The model of social capital and inter-organizational collaboration was modified to investigate the effects of different dimensions of social capital on the Corporate Social Responsibility (CSR) disclosure of organizations. Here, the latent construct 'CSR' was measured using two indicators: the amount of money spent on CSR related activities and the number of different types of CSR areas covered by the firm. Further, the link between the CSR disclosure and the performance is also investigated. The estimated model is given in the figure 6.14.

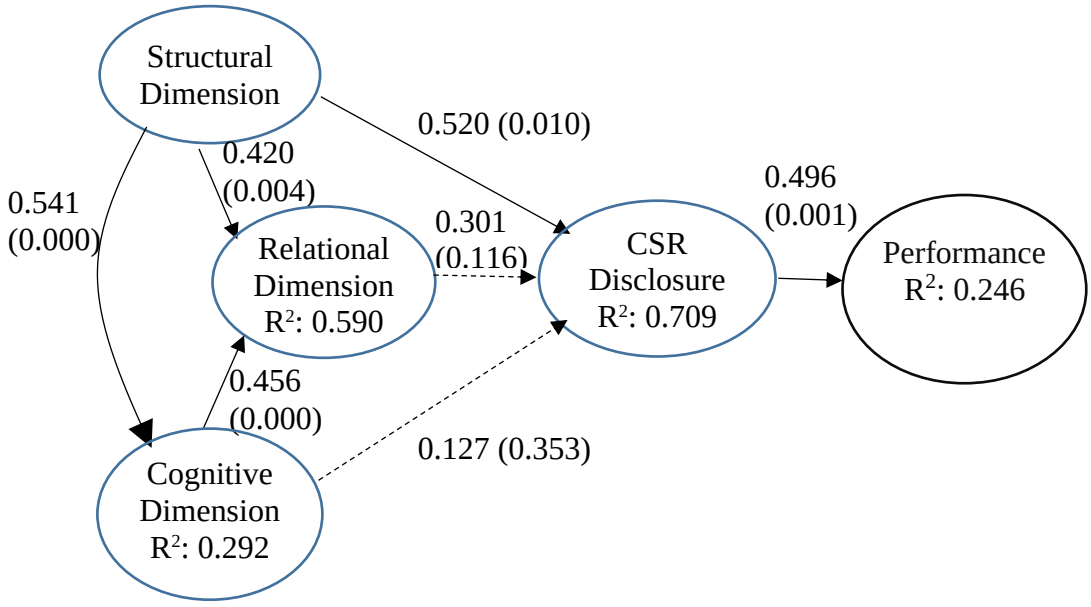

Figure 6.14 : Model of SC, CSR and Performance

The results indicate that the structural dimension of social capital which is represented by the degree of inter-organizational social relations is strongly associated with the degree of CSR disclosure of the organizations. This is indicated by a path coefficient

of 0.520 (p value = 0.010). The relational and cognitive dimensions of social capital don't show any such significant association with the CSR disclosure of organizations. The coefficient of determination (R2) of CSR disclosure is 0.709 indicating significant predictive power of social capital. This finding can be considered a to have a significant impact especially in the developing countries where the CSR contributions of finance organizations can contribute to the social development at a larger scale than in developed countries.

These results are also complimenting the studies that previously identified a positive link between social capital and CSR (Sacconi and Degli Antoni 2008, Degli Antoni and Sacconi 2011). For example, Jha and Cox (2015) found that organizations operating in a high social capital region have higher levels of CSR. González-Rodríguez et al (2015) found that human values influence perceptions of CSR of customers and entrepreneurs, and will lead to improved business performance.

Further, it is also evident that the CSR disclosure of organizations is strongly associated with the firm performance with e path coefficient of 0.496 (0.001). The coefficient of determination (R2) of 0.246 for firm performance indicate a significant predictability of firm performance through the CSR disclosure of firm.

This result is also consistent with previous studies that found a positive link between the CSR of organizations and the firm performance. Scholars have explained this relationship in different perspectives. Some of the explanations for the positive association between the two includes; customer goodwill (Ruf, Muralidhar et al. 2001), attractiveness to potential employees (Turban and Greening 1997, Greening and Turban 2000), increased corporate identity, image and reputation (Sen and Bhattacharya 2001, Lichtenstein, Drumwright et al. 2004, Maignan and Ferrell 2004, Simoes and Dibb 2008); positive stakeholder attitude (Sen, Bhattacharya et al. 2006, Sacconi and Degli Antoni 2008); greater intention to invest in the company (Graves and Waddock 1994); reduce levels of risk (Clarkson 1995) and reduction of cost of capital (Diamond and Verrecchia 1991, Baiman and Verrecchia 1996).

6.6 Analysis 4: Supplementary Dyadic Analysis

For the analysis described above, the original relational data was converted to firm-level measures as the hypotheses were formed at the firm-level. Althouth this kind of approach is not an unusual in management studies that apply network analysis (e.g. Ibarra 1993, Powell, Koput et al. 1996, Tsai and Ghoshal 1998, Ibarra, Kilduff et al. 2005), it may raise some concerns about the level of analysis and the reliability of the results. As a precaution against the limitations of using a small sample in a traditional statistical analysis, supplemental analysis was carried out at the dyadic level, using the Multiple Regression Quadratic Assignment Procedure (MRQAP) suggested by Krackhardt (1988). MRQAP is a nonparametric statistical algorithm regressing a dependent matrix on one or several independent matrixes. The main advantage of this algorithm is that it is robust against varying amounts of row and column autocorrelation in the dyadic data. A similar supplementary approach has been used by previous researchers in the same area (Tsai and Ghoshal 1998).

The MRQAP was implemented using ORA 2.2.7 network analysis tool (Carley and Reminga 2004). The dependent matrix was degree of collaboration, and the independent matrixes were inter-organizational social interactions, inter-organizational trust, and inter-organizational shared understandings. These three independent matrixes were created by combining the multiple networks in each category. For example, the two correlated trust networks were combined to form a single trust network by taking the average value for each cell. Such that, the resulting three matrixes carried values for each cell representing the weight of link between the two respective organizations. Table 6.38 presents the MRQAP results. As this table shows, the results were consistent with the findings of previous analysis using SEM. As expected, social interaction and trust were significant determinants of degree of strategic collaboration.

Table 6.38 : MRQAP Results

Network	Correlation	Significance – P Value
Inter-organizational social interactions	0.133	0.000
Inter-organizational trust	0.497	0.000
Inter-organizational shared understandings	0.121	0.072

6.7 Summary

This chapter discussed the various types of analysis followed in this research to examine the validity of the primary model and to answer the research questions proposed in the Chapter 3. The chapter initially explains how a structural model is developed, estimated and validated. Consecutively, the chapter explains how those techniques are applied to the development and validation of the structural models in this research based on the data collected in order to validate the proposed hypotheses.

In summary, the results suggest that both structural and relational social capital strongly and positively affect inter-organizational alliances while cognitive dimension of social capital provides no significant effect. However, the high levels of ICTs appear to strengthen the cognitive dimension's effect on inter-organizational collaboration. The comparison of alternative blocks of indicators reveals that when social capital dimensions are measured using network measures, the model can better predict the IORs, compared to the use of regular indicators. Further, use of alternative network measures for the structural social capital reveals that the betweenness centrality and effective network size measures yield better results than other network measures.

Further, the range of organizational level factors that can strengthen the drive of social capital towards IORs has been identified through tests of moderation. These factors are; ICT capability, Firm size, Age, Gender Ratio of Director Board, Ownership, Geographic Spread, Culture, Organization Structure and Previous Alliance Experience significantly moderate the influence of social capital on degree of strategic collaboration. The moderating role of various ICT capabilities were examined and the factors that can amplify the social capital's effect on inter-organizational collaboration are identified.

The structural model has been further extended to show further value creations of firm-level social capital. Firstly, the model was extended to show that inter-organizational alliances lead to increased firm performance. Also, another extension of the model is used to show that social capital yield better CSR in banking organizations, which in turn lead to increased performance. Such results indicate that social capital is powerful

resource that drive organizations to act collectively and gain benefits in firm-level and beyond and under what circumstances such effects can be further improved. This is an especially beneficial finding for developing countries.

Chapter 7

CONCLUSION

7.1 Introduction

Organizations today cannot count purely on their own resources to survive in the markets. Collaboration is rapidly gaining popularity over competition as a business strategy. Collaboration enables sharing risks and capabilities with partners having the same need. It is pertinent to understand the ways in which stronger relationships can be established. In the study of Inter Organizational Relationships (IORs), a key challenge is to unveil the secrets behind why and how some organizations better collaborate with others.

Social capital has been identified as an vital feature in developing relationships of trust, laying the foundation for greater collaboration (Leana and Van Buren 1999). Social capital is a multi-dimensional, relational concept that could be used as a powerful tool to study inter-organizational relationships. Moreover, social capital offers the basis for better stakeholder relationships, which are essential for Corporate Social Responsibility (CSR). CSR is touted as a key enabler of both organizational performance and of sustainable development, which are also essential for developing economies. It is also apparent that social capital and ICT are mutually complementary at the inter-organizational level (Reich and Kaarst-Brown 2003, Steinfield 2004, Williamson 2004, Shah, Cho et al. 2005, Huysman and Wulf 2006, Ellison, Steinfield et al. 2007). The present study provides empirical evidence supporting a model of social-capital-based IORs answering the question of 'how the multiple dimensions of social capital and ICT capability drive the inter-bank alliances in a developing country, Sri Lanka'.

The purpose of this chapter is to summarize the findings, implications, contributions and limitations of this research. This chapter is organized as follows. Firstly, section 8.2 revisits the research questions and explains the findings of this research. Section 8.3 discusses the implications of the research which is followed by section 8.4 which

discusses the contribution that this research has made to the existing body of knowledge. Section 8.5 discusses the limitations of this research. Finally, section 8.6 discusses how this research could be extended in future research work.

7.2 Revisiting the Research Questions

This study attempted to answer a main research question followed by three subsidiary research questions. The primary research question of this research is '***What components and relationships are needed in a model of social capital and inter-organizational collaboration in the Sri Lankan banking sector?'*** To answer the primary research question as above, several subsidiary research questions are formulated. The first subsidiary research question is '*What are the key aspects of the structural, relational and cognitive dimensions of social capital that positively or negatively influence collaboration in the Sri Lankan banking industry?*'. The second subsidiary research question of this research is '*What other factors (enablers and inhibitors) strengthen or weaken the influence of social capital on collaboration?*'. The third subsidiary research question of this research is '*How can network science approaches be used to analyse the aspects of and relationships between social capital dimensions to better predict collaboration in the Sri Lankan banking industry?'*. To answer the above research questions, a conceptual model of social capital based inter-organizational collaboration was developed based on a comprehensive review of the literature and was validated using numeric data collected from managerial staff of banking organizations in Sri Lanka and assessed through PLS-SEM.

To answer the first subsidiary research question, '***What are the key aspects of the structural, relational and cognitive dimensions of social capital that influence inter-organizational collaboration in the Sri Lankan banking sector?***' indicators of each social capital dimension were identified through literature and the banking domain and these measurement models were tested using collected data. The structural dimension of social capital is concerned with the specific structural properties of social networks that support inter-organizational collaborations. We studied the centrality of organizations in social interaction networks using centrality of firm-level social event participation and centrality of director level social contacts as the reflective indicators

of the structural dimension. Further, different other structural properties such as degree of structural holes in an ego network and brokerage positions were investigated as facets of structural social capital that support inter-organizational collaboration. Relational dimension of social capital harness the power of affective relationships that build over a history of interactions (Granovetter 1992). We studied 'perceived trustworthiness' of organizations using three reflective indicators, namely, trust based on non-opportunistic behaviour, trust based on past promise keeping, and trust based on institutional reputation. The cognitive dimension is concerned with the cognitive reasoning such as shared vision, shared work norms and shared knowledge that enables two entities to effectively understand each other and work towards common goals. Such norms could develop over recurrent social interactions. In this research, we studied the extent to which an organization shares its cognition with rest of the organizations, using indicators of shared vision, shared norms (understandings) and shared market knowledge. The measurement model developed with these indicators was validated for fitness and for convergent and discriminant validity.

To answer the second subsidiary research question, '***What other factors strengthen (enable) or weaken (inhibit) the influence of social capital on collaboration in the Sri Lankan banking sector?***', moderation effects of various aspects of ICT capabilities of banking organizations were investigated through tests of moderation effect such as interaction terms and multi-group moderation. Overall, the analysis revealed that ICT capability, Firm size, Firm age, Gender ratio of director board, Ownership, Geographic spread of branches, Culture, Organization structure and Previous alliance experience significantly moderate the influence of different diemensions of social capital on inter organizational collaboration (IOC). It was noted that the ICT capability has a stronger enabling effect on the cognitive dimension compared to other two dimensions. In particular, the analysis of individual firm-level ICT capabilities reveal that factors such as the use of internal banking software, use of social media, availability of in-house ICT-related human resources and the degree of participation in shared interbank systems act as enablers to the Cognitive dimension's effect on IOC strengthening its effect. Also, both the use of communication tools and the degree of participation in interbank shared systems strengthen the effect of Relational dimension's effect on IOC. However, the availability of in-house ICT-

related human resources tend to act as an inhibitor to the Relational dimension's effect on IOC. While the Structural dimension's effect on IOC was strengthened by hierarchical organizational structures, it was weakened by firm size, firm age, gender ratio (F:M) of directors, geographical spread and previous alliance experiences. Similarly, the relational dimension was affected by firm ownership, culture and previous alliances. While the effect of Relational dimension on IOC was stronger for both private organizations and local organizations, previous alliance experience act as an inhibitor to the effect. The cognitive dimension was strengthened by firm size, age, geographical spread and previous alliance experience. The SEM analysis further indicates that Head Office location or International Exposure do not improve the effect in a similar manner.

To answer the third subsidiary research question, '***How can network science approaches be used to analyse the aspects of social capital dimensions to better predict collaboration in the Sri Lankan banking sector?***', multiple alternative blocks of indicators have been used to test the model. First, the structural model was run using non-network (regular type) measures as the indicators of social capital constructs and the validity and predictability were examined. Consequently, the model was tested interactively using several alternative blocks of indicators comprising different network measures to represent different locational properties. This analysis revealed that when the network measures are used as indicators of social capital dimensions, the model can predict the IORs better than when using non-network measures. Moreover, among a number of network measures, betweenness and effective network size yielded the best predictability. Furthermore, a dyadic level matrix regression, namely, MRQAP was performed as a supplemental network analysis. The MRQAP analysis further indicates that pairwise analysis between a set of independent matrixes (social, relational and cognitive) and a dependent matrix (inter-bank partnerships), also provide similar results as the SEM using network measures.

In answering the general research question, '***What components and relationships are needed in a model of social capital and inter-organizational collaboration in the Sri Lankan banking sector?***', the literature-based model developed in this study incorporating the relevant theoretical constructs and relationaships was validated

through PLS SEM using the data collected from the banking domain. The results of the data analysis indicate that both structural and relational social capital act as strong predictors of inter-organizational collaboration in the banking industry in Sri Lanka. As a further step, the effect of inter-organizational collaboration on firm performance was tested and a positive association was confirmed. Moreover, the result of further analysis shows that there is a significant positive relation between structural social capital and the CSR disclosure of banking organizations, which in turn positively influence the firm performance. Based on the findings, this research concludes that social capital could contribute significantly towards enabling inter-organizational collaborations, corporate social responsibility and financial performance of the banking organizations industry in Sri Lanka. This research also concludes that increased ICT capability of organizations positively moderates and strengthens the effect of all three dimensions of social capital towards inter-organizational partnerships.

7.3 Implications

Inter-firm collaboration plays a very important role in economic growth. Focusing on inter-firm collaboration in the banking sector in Sri Lanka, this study has made several important contributions. The results from this quantitative study have provided some useful data and implications for researchers, managers, as well as policy makers.

The major implication of this research is the recognition of social capital as a resource that could facilitate effective inter-organizational collaborations and increased performance in the banking industry in Sri Lanka, a developing country. This means that inter-organizational social ties, perceived trustworthiness of individual organizations and shared understandings with external organizations are sources that could reduce barriers to collaborating with other organizations, thereby paving the way to increased value creation for the individual organizations. Being a developing country, this finding is especially important for Sri Lanka. The ability to recognize and harness the power of freely available resources such as social capital may greatly empower developing nations towards sustainable development.

The second major implication of this research is the recognition that a range of firm-level factors contribute to the organizations' ability to utilize the power of social capital towards collaboration. First, the empowering role of ICTs such as communication tools, ICT-based banking services, social media, participation in inter-bank information systems, ICT infrastructure and ICT human resources has been revealed. The utility of firm-level ICT capabilities in strengthening the cognitive social capital is notable. Such findings facilitate decision makers to focus on developing firm-level ICT capabilities that enable organizations to connect more effectively with other organizations. Secondly, it is evident that firm size, age, gender ratio of director board, ownership, geographic spread, culture, organization structure and previous alliance experience significantly moderate the influence of social capital on strategic collaboration. Such findings imply that a range of organizational level factors could be controlled in order to fine-tune the effect of social capital on the firm's ability to collaborate with other organizations.

The findings also imply that social capital can be an important factor in improving the corporate social responsibility of organizations. CSR disclosure of organizations were positively associated with the firm-level structural social capital represented by degree of inter-organizational social relations. This finding provides important implications for developing contexts. In Sri Lanka, the banking sector steers the field of CSR among other businesses, providing financial support for social development in a range of domains, including health-care, education, knowledge sharing, empowerment of women, environment protection, disaster relief, community infrastructure, youth empowerment and disabled and elderly care etc. Engaging in CSR not only adds value to the business in many ways such as improved corporate reputation and customer goodwill, but also offers an opportunity for governments to change the terms on which they interact with business. Such activities can help to develop capacity within public policy to leverage resources through partnership. This finding enables further recognizion of the value of social capital as a means of nurturing corporate social behaviour of organizations while creating potential benefits for public policy.

The results of this study also bring implications for performance improvement in individual organizations. The results show that the financial performance of individual organizations is positively associated with the involvement of inter-organizational strategic collaborations as well as corporate social responsibility of organizations. While the individual organizations could benefit through investing in social capital, it will also provide implications to the larger society in the form of sustainable development through improved corporate social responsibility. Therefore, the measurements of social capital could be incorporated as an integral element of intangible assets in future company portfolios.

The implications of this study are useful for policy makers of the financial industry by providing guideline for how inter-organizational collaborations and thereby social responsibility could be improved through the use of social capital and how the ICT aspects can be enhanced to boost this effect. The Sri Lankan Government and the Central bank can harness the new knowledge to create effective policies and regulations for the finance sector, which in turn will affect the economy as a whole. Moreover, the financial authorities in other developing countries with similar social, political and economic conditions may also gain much value from the findings of this study. Researchers can further analyse the applicability of the results for similar emerging economies and explore variances under specific circumstances. Systems analysts and designers could use such knowledge to design more effective inter-organizational systems considering the social capital aspects.

7.4 Contributions

This research makes a number of contributions to the existing body of knowledge from both a practical perspective and a theoretical perspective. From a practical perspective, this research identifies Social Capital as an appropriate resource that facilitate inter-organizational relationships in the Sri Lankan banking industry. A range of firm level factors that may manipulate the above effect were also identified. These factors include different ICT capabilities, Firm size, Firm age, Gender ratio of director board, Ownership, Geographic spread of branches, Culture, Organization structure and Previous alliance experience. The study also reveals that Social Capital

is positively related to Corporate Social Responsibility of organizations and that inter-organizational collaboration is positively associated with the firm performance. These findings may provide useful insights for the development of effective strategies and inter-organizational systems in the Sri Lankan banking sector. The findings of this study might also be relevant to inter-organizational relationships in other sectors in Sri Lanka. Moreover, these results may also be relevant and useful for other developing countries with similar social and economic conditions and may contribute to achieve sustainable development.

This research makes several contributions from a theoretical perspective. The findings of this study contribute to the body of knowledge on Social Capital, ICT for Development, Inter Organizational Relationships, Corporate Social Responsibility and Network Science, offering a more holistic perspective that incorporates social, technical and organizational aspects and provides insights useful for building effective strategies in similar developing countires.

Firstly, this research contributes to the theory of social capital and provides empirical evidence supporting a model of how structural, relational and cognitive dimensions of social capital together with ICTs and a range of other organizational factors (i.e. firm size, Age, Gender Ratio of Director Board, Ownership, Geographic Spread, Culture, Organization Structure and Previous Alliance Experience) influence inter-organizational collaboration in the banking industry. It identifies multiple facets of the three dimensions of social capital in the inter-bank context in Sri Lanka that contribute to inter-organizational collaboration, adding to the social capital literature.

Secondly, this research also contributes to the growing body of knowledge of 'ICT for Development'. Through the identification of overall and individual ICT capabilities as enablers to social capital driven inter-organizational collaboration, this research contributes to the body of knowledge on ICT for Development and provide a baseline for similar studies in other developing countries. Although scholars in this area of research have studied many aspects of development (e.g., healthcare, poverty reduction, and education) and a range of ICT innovations (e.g., mobile money exchange services, geographic information systems) over the past few decades, there

is a lack of consensus on the meaning of 'development', and a lack of theory explaining the link between ICT and development. The need to consolidate the theoretical basis of the field has been recently recognized (Warmerdam, Riper et al. 2012, Foster and Heeks 2013, Papaioannou, Allen et al. 2014). In this context, social mechanisms that facilitate development outcomes is a popular area of interest. "*Social mechanisms operate across multiple levels, incorporate multiple causal explanations, and embody the context in which they occur*" (Hayes and Westrup 2012, Avgerou 2013). While the findings of this study contribute to a broad definition of 'Development', which goes beyond economic measures, this study provides empirical evidence that social capital positively affects the inter-organizational collaboration and corporate social responsibility of organizations, creating a collaborative corporate culture, which in turn will promote sustainable development. The important role of ICTs in strengthening cognitive social capital's effect on inter-organizational collaborations is also empirically validated.

Thirdly, this research contributes to the existing body of knowledge by revealing that network measures could be used to better investigate prevailing arguments in structural social capital such as structural holes and brokerage opportunities. Further it provides a methodological guideline to other researchers in this area by showing that the combination of network measures and structural modelling techniques can be used to investigate aspects of inherently networked concepts like social capital. The identified predictive power of network measurements and techniques contribute to network theory and will provide a foundation for future researchers of network science in various contexts and the building of subsequent theory.

Fourthly, the findings of this research add to the existing body of knowledge of the resource-based perspective of Inter-Organizational Relationships by revealing the significance of social connections for understanding IORs, viewing connections as both a resource and as providing access to resources. The findings of this study contribute to the prevailing questions of IOR such as 'who engages in IORs?' and 'how and why are partners selected?'

Lastly, the study also provides new knowledge in the area of corporate social responsibility by providing empirical evidence that the CSR of organizations can be improved by enhancing their social capital. CSR is a research area that has significant impact in the developing contexts.

Overall, this study provides new knowledge in multiple streams of literature such as Social Capital, Inter Organization Relations, ICT for Development, Corporate Social Responsibility and Network theory. This study may assist other researchers who set-out to build and validate new predictive theories following a quantitative approach. This study may also serve as a starting point of new research in the direction of creating successful inter-organizational systems. It is contributing to a more holistic perception integrating social, technical and organizational aspects, which will also be beneficial for a wide audience of researchers in the future.

7.5 Recommendations

The findings could be directly applied through reforming strategies and policies to recognise and take advantage of the effects of social capital and ICT on inter-organizational collaborations. The results from this study provide useful policy implications for the Government, the Central bank, industry associations and individual banks.

Recommendations to Government and Policy Makers

It is important that the Government and policy makers recognize the value of social capital as a collective resource that facilitates sustainable development. The Government has an important role to play in enabling conditions for social capital formation within (bonding) and across (bridging) industries. This could be achieved by working towards maximising informal networking opportunities, maximising shared understandings, reducing uncertainty, reducing power asymmetries, and adopting new technologies.

Informal networking allows weak ties to form between parties, hence creating new paths for social capital transactions in the future. While institutions with a single sectorial focus can enable conditions for social capital formation within the industry, the intermediary institutions such as business associations, regional development agencies, or alternative facilitating agents and providers of business development services can promote formation of bridging social capital across organizations from different sectors. Investing in R&D on Social Network Analysis (SNA) and identifying how to assess and support strategically important informal networks will be a key to sustainable development. R&D approaches should be revamped to focus on the network view, in order to increase communication across organizations in terms of business approaches and business opportunities. Sessions of informal interaction after formal meetings can be the best time to have bonding and bridging interactions. Other opportunities for informal networking include professional associations, clients' events, trade unions, shared educational institutions, alumni associations, social clubs, skills development groups, cultural and religious groups, sports groups, and special interest groups.

Strategies can be put in place to facilitate the development of trust among businesses within the industry. To improve the business collaboration environment, efforts need to be undertaken to encourage information sharing, a reduction in the barriers to smaller and new organizations, provision of a level playing field for every firm, reducing restrictions, and enhancing government services and support (such as consultation). Industry associations and business networks can also assist the Government in developing trust among parties. Adopting new technologies and global standards will facilitate the extablishment of inter-organizational trust and enhance the rate of both international and local inter-firm collaborations. To encourage businesses and other organizations to embrace technology, Government could work on reducing the tax on new technologies and data use, invest in R&D and support shared systems and collaborative platforms.

It is also important to encourage organizations within the industry to identify and work towards common goals. Banks have similar objectives when it comes to global best practices on environmental and social issues, corporate governance, knowing your

customer norms, and combatting money laundering. Identifying common goals, continuous exchange of views, and incorporation of common terms in documentation would be very helpful for creating common understandings and smooth execution of collaborative transactions. Also, through knowledge sharing sessions, industry organizations could enable increased communication across organizations in terms of business approaches and business opportunities.

Recommendations to Individual Banks

The results of this study are also useful for the individual organizations. In today's knowledge-intensive economy, business goals are increasingly accomplished collaboratively. This involves working together with competitors through formal and informal networks, which is also known as co-opetition. The results of this study revealed that social relationships at the executive level may strongly affect inter-organizational formal relationships and organizational performance. In other words, social capital and ICT together plays an enabling role towards co-opetition between banking organizations as expected.

Therefore, assessing and supporting strategically important informal networks in organizations can yield substantial performance benefits. Use of social network tools and diagrams may provide a means with which to identify and assess the health of strategically important networks within and beyond an organization. Uncovering these otherwise ‘invisible’ patterns could enable management to work with important groups to facilitate effective inter-organizational collaboration. Network diagrams can be very compelling tools, which re-focus executive attention on how leadership behaviours affect the relationships and information flows within and beyond the organization, affecting the organizational effectiveness. Banks should therefore assess their position in their corporate social network and work to better position themselves within the evolving market by investing in developing social capital.

With the new knowledge, businesses can decide where to concentrate when developing social capital. Understanding the different dimensions of social capital enables managers to recognise the impact of relationships on the organization’s activities.

While engaging people in organizational activities, enhancing the collaborative capacity of employees and promoting organizational norms and values may develop social cohesiveness among employees, facilitate employee commitment to corporate goals and may contribute to formation of external social capital.

Facilitating opportunities for the key people in business organizations to establish bonding, bridging and linking ties with key stakeholders (such as customers, suppliers, competitors, business partners, local communities, and government officials and policy makers) will greatly benefit individual organizations. In doing so, it is more important to strengthen the links between personnel in boundary-spanning roles (working directly with other organizations) and the strategic leadership of the firm. Network relationships may serve as anchoring points that hold the loyalty and commitment of employees towards the organization. While catering for staff's personal needs for external linking, it is also vital to maintain sufficient proximity to internal members and groups, who can translate the flow of knowledge and other resources into competitive advantage. Revisiting HR policies that block collaborative culture within and beyond the firm will also be beneficial. Recruitment criteria may be improved to recognize the social capital of candidates as an asset in addition to the other traditional criteria such as qualifications, experiences and skills. Such assets as individuals' social capital may bring more value into the organization.

Our results further suggest that although social relations cannot be mandated by management, they are strongly affected by elements under management control, such as ICT capabilities, organizational hierarchy, head office location, gender ratio in the board of directors, and so on. Recognition of these firm-level factors can help organizations to fine-tune their business model, creating better opportunities to adapt and benefit from co-opetitive stratergies in the future. Organizations that recognize the significance of investing in social capital should enable conditions to nurture social capital through carefully analysing and reforming these firm-level factors and their existing HR practices. Most importantly, the results show that ICTs play an important role in strengthening cognitive social capital. As insitutions of technology intensive and highly connected industry, financial institutions should therefore focus on adopting collaborative technologies, including shared inter-bank systems. Modern-day

financial transactions involve multiple parties and are time critical. ICTs that enable faster and secure messaging, efficient document generation and sharing have the potential in strengthening such interactions. The ability to implement and participate effectively in co-opetitive initiatives will be central to gaining competitive advantage and maximising profitability. Such expertise or readiness may not only enable organizations to solve problems in collaboration with competitors, but also may serve as a valued resource for future exchanges.

7.6 Limitations

There are several limitations in this research. These limitations are related to the generalizability, number of data points and selection of the research method.

In this research, data was collected from all the banking institutions in Sri Lanka. There are 34 banking organizations including state banks, private banks, and foreign banks. The survey covered all the 34 banking organizations in the population and with multiple responses from each firm. Although we surveyed the entire population of banks, the smaller number of data points may have affected statistical procedures such as resampling techniques. However, the use of PLS SEM for model estimation and the careful consideration of the sample size requirements have been used as preventive measure against such issues in this study.

Sri Lanka has its own local culture, which might differ from other developing economies' local cultures, so that the findings may not generalize well to other developing economies. Countries vary widely in their social capital due to cultural traits. Sri Lanka is a developing country with a highly cohesive society. According to the Legatum rankings of 2015 and 2016, Sri Lanka is placed in the 32nd place and 19th place in the social capital sub index. It was also ranked world's first in social volunteerism. The **Legatum Prosperity Index** is an annual ranking of 142 countries, developed by the Legatum Institute. The ranking is based on a variety of factors including wealth, economic growth, education, health, personal well-being, and quality of life. The high levels of predictability of strategic collaboration found in this study, could be accounted for by such special cultural traits.

This research was based on data from the Sri Lankan banking industry. Therefore, the results may not be directly generalized to other countries with different cultural and economic backgrounds. It is also important to recognise that the inter-bank domain is highly dependent on economic conditions, government policies, and regulations of the central bank as the supervisory body of the financial system, and is highly profit driven. The results may not be directly generalizable to other industries.

There may also be limitations with regard to certain measurements. For example, the measurement of Corporate Social Responsibility (CSR) was based on the annual reports which self-reported disclosures by the organizations, leaving the possibility of over-reported and under-reported cases. However, data collected through surveys at large might have produced more reliable results. The centrality measurement of strategic collaboration was based on data collected from a survey question regarding syndicated loan participation during a given period of time. Moreover, firm performance was measured by only two profitability measures: Return on Assets (ROA) and Return on Equity (ROE).

During the course of this research, managerial staff provided answers to questions of social capital dimensions based on their experience. Although most respondents were well experienced top level managers, who are suitable to represent the 'organization' or CEO of the organization, some respondents were middle level managers who may have different levels of experiences. Therefore, the true potential of social capital on inter-organizational strategic relationships may not have been revealed by the results of this research. In addition, this research only considers the perceptions of bank managers in drawing conclusions. The perceptions of other stakeholders such as customers, intermediaries and regulatory bodies were not examined in investigating the enabling role of social capital on inter-bank relations. Perceptions of such stakeholders could also be important for revealing the true potential of social capital.

Finally, this research follows a quantitative research strategy to answer the research questions. A quantitative research strategy is useful for obtaining results in research that could be generalized for a larger population, but often does not allow exploring a

certain phenomenon in detail. Thus, individuals' perceptions on the enabling role of social capital for inter-bank relationships are not heard in detail in this research

7.7 Future Work

Social capital is an expanding field of study that is making a significant contribution in management research. It suggests that some people and organizations do better because their connections enable them to access and benefit from a range of opportunities and resources. However, we still have much to learn both about social capital and its role in inter-organizational relationships.

This research followed a quantitative research approach combined with network measures to answer the research questions of this research. Even though the collaboration in the banking industry is pertinent to be explored, the interactions between banks are complex to fully capture. Network methods could be further utilized to capture the effect of different dimensions of social capital on the various types and levels of collaboration between banks. A full meta-network approach could be used to provide a holistic view of inter-bank collaborations and would consist of a variety of entity types; people, roles, organizations, resources, tasks, activities, events, locations, and beliefs. These entity types can create a number of different networks through various link combinations. As the network methods enabled to model and measure various characteristics of the structural dimension of social capital, it is also important to identify equally powerful measures for the relational and cognitive dimensions.

Future research should also focus on how to build social capital in organizations and how to manipulate it for the benefit of individual organizations and the industry level sustainability. Researchers should further investigate how far and under what circumstances can social capital be developed at the firm level and beyond. Also, it is important to investigate which dimensions of social capital are more open to formal development than others.

Moreover, the future studies could focus on identifying formative measurement models for the three dimensions of social capital and inter-organizational

collaboration. A formative measurement may consider both micro (directors' links) and macro (firm-level links) level inter-organizational social ties in a direct or indirect manner.

In section 3.2.2.4, this study presented an initial conceptual framework of 'How' different aspects of social capital enable inter-organizational alliances by bringing down various barriers associated with different stages in alliance formation. Future research could focus on extending this framework and providing empirical evidence of inter-organizational relationships from banking or other sectors.

In addition to the model of social capital and ICT based inter-organizational collaboration, this study presented literature-based arguments laying the foundations for a framework on how social capital serves as a useful resource that has the potential to bring down the barriers that impede the successful completion of the process of partnership establishment. Social capital of an organization provides influence, information, and accessibility to opportunities, helps establish trust, and enables effective communication, thereby laying the foundation for successful strategic collaborations. Future research could investigate this proposed framework in detail with empirical evidence.

The cultural and contextual aspects of social capital are yet to be explored in relation to inter-organizational relationships. The comparison of the results of this study with results from other contexts revealed that the strength of effects of social capital may vary across studies. Future studies could investigate what cultural and contextual factors may affect such differences. In this area, future research could focus on how different organizational cultures might impact inter-organizational relationships.

A quantitative research strategy is useful for generalizing results of the research to a larger population. However, the ability to hear individuals' perceptions in detail is limited in the above strategy. To discover the practinioners' perceptions on Social capital based inter-organizational collaborations in detail, future research could collect qualitative data on how social capital could support the formation of inter-organizational collaborations. For example, interviews could be conducted with key

people who participated in this study where they can express their opinions on using social capital for formal partnership building in detail. In addition, future research could collect data from other stakeholders of inter-organizational alliances whose perceptions are important to understand how social capital could be used for formal collaborations between organizations.

Similar to the findings of this study, social capital may be used as a resource in many developing countries to facilitate inter-organizational collaborations even in other industries. Review of the literature on this topic has revealed, however, that there is a call for theories and empirical evidence to explain '*why and how inter-organizational relationships are more successful than others?*' and this is especially useful for developing countries. Thus, there is ample space for future research to grow in the direction of social capital based inter-organizational relations in developing countries. For example, the new theory developed in this study could be further empirically validated and generalized using data from other developing and developed countries. Also, the stakeholders' perceptions on challenges and opportunities in facilitating social-capital-based inter-organizational collaborations could be further investigated.

REFERENCES

Acedo, F. J. and M. V. Jones (2007). "Speed of internationalization and entrepreneurial cognition: Insights and a comparison between international new ventures, exporters and domestic firms." Journal of World Business **42**(3): 236-252.

Acquaah, M. (2007). "Managerial social capital, strategic orientation, and organizational performance in an emerging economy." Strategic Management Journal **28**(12): 1235-1255.

Acquaah, M. (2011). "Utilization and value of social networking relationships in family and nonfamily firms in an African transition economy." European Management Journal **29**(5): 347-361.

Acquaah, M. (2012). "Social networking relationships, firm-specific managerial experience and firm performance in a transition economy: A comparative analysis of family owned and nonfamily firms." Strategic Management Journal **33**(10): 1215-1228.

Adam, M. S. and C. Urquhart (2009). "No man is an island: Social and human capital in IT capacity building in the Maldives." Information and Organization **19**(1): 1-21.

Adelman, I., J.-B. Lohmoller and C. T. Morris (1987). "A latent variable regression model of nineteenth century economic development." Working paper series-California Agricultural Experiment Station.

Adler, P. S. and C. Heckscher (2006). "Towards collaborative community." The firm as a collaborative community: Reconstructing trust in the knowledge economy: 11-105.

Adler, P. S. and C. C. Heckscher (2006). The firm as a collaborative community: Reconstructing trust in the knowledge economy, Oxford University Press Oxford, UK.

Adler, P. S. and S.-W. Kwon (2002). "Social capital: Prospects for a new concept." Academy of management review **27**(1): 17-40.

Adobor, H. (2005). "Trust as sensemaking: the microdynamics of trust in interfirm alliances." Journal of Business Research **58**(3): 330-337.

Adobor, H. (2006). "The role of personal relationships in inter-firm alliances: Benefits, dysfunctions, and some suggestions." Business Horizons **49**(6): 473-486.

Agénor, P.-R. and H. T. Dinh (2013). "Public policy and industrial transformation in the process of development."

Aguinis, H., R. J. Boik and C. A. Pierce (2001). "A generalized solution for approximating the power to detect effects of categorical moderator variables using multiple regression." Organizational Research Methods **4**(4): 291-323.

Ahuja, G. (2000). "Collaboration networks, structural holes, and innovation: A longitudinal study." Administrative science quarterly **45**(3): 425-455.

Ahwireng-Obeng, F. and O. Egunjobi (2001). "Performance determinants of large-small business strategic alliances in South Africa." South African Journal of Business Management **32**(3): 41-51.

Ainuddin, R. A., P. W. Beamish, J. S. Hulland and M. J. Rouse (2007). "Resource attributes and firm performance in international joint ventures." Journal of World Business **42**(1): 47-60.

Akhavan, P. and S. M. Hosseini (2015). "Determinants of knowledge sharing in knowledge networks: a social capital perspective." IUP Journal of Knowledge Management **13**(1): 7.

Akinpelu, Y. A., O. J. Ogunbi, Y. Olaniran and T. Ogunseye (2013). "Corporate social responsibility activities disclosure by commercial banks in nigeria." European Journal of Business and Management **5**(7): 173-185.

Al-Rasheed, A. M. and F. M. Al-Qwasmeh (2003). "The role of the strategic partner in the management development process: Jordan Telecom as a case study." International Journal of Commerce and Management **13**(2): 144-175.

Al-Tabbaa, O. and S. Ankrah (2016). "Social capital to facilitate 'engineered'university–industry collaboration for technology transfer: A dynamic perspective." Technological Forecasting and Social Change **104**: 1-15.

Al-Tabbaa, O., K. Gadd and S. Ankrah (2013). "Excellence models in the non-profit context: strategies for continuous improvement." International Journal of Quality & Reliability Management **30**(5): 590-612.

Albers, S. (2010). PLS and success factor studies in marketing. Handbook of partial least squares, Springer**:** 409-425.

Albertazzi, U. and D. J. Marchetti (2010). "Credit supply, flight to quality and evergreening: an analysis of bank-firm relationships after Lehman."

Alderson, D. L. (2008). "OR FORUM—Catching the "Network Science" Bug: Insight and Opportunity for the Operations Researcher." Operations Research **56**(5): 1047-1065.

Aldrich, H. E. and C. M. Fiol (1994). "Fools rush in? The institutional context of industry creation." Academy of management review **19**(4): 645-670.

Alesina, A. F., F. Lotti and P. E. Mistrulli (2013). "Do women pay more for credit? Evidence from Italy." Journal of the European Economic Association **11**(s1): 45-66.

Alessandrini, M. (2006). "Getting Connected: Can Social Capital be Virtual." Webology **3**(4): EJ.

Allen, F. and A. Babus (2008). "Networks in finance."

Allen, F. and D. Gale (2000). "Financial contagion." Journal of political economy **108**(1): 1-33.

Allen, J. W. and G. M. Phillips (2000). "Corporate equity ownership, strategic alliances, and product market relationships." The Journal of Finance **55**(6): 2791-2815.

Ally, Z. (2013). "Comparative analysis of financial performance of commercial banks in Tanzania." Research Journal of Finance and Accounting **4**(19): 133-143.

Alvarez, S. A. and J. B. Barney (2001). "How entrepreneurial firms can benefit from alliances with large partners." The Academy of Management Executive **15**(1): 139-148.

Anand, B. N. and T. Khanna (2000). "Do firms learn to create value? The case of alliances." Strategic management journal: 295-315.

Ancona, D. G. (1990). "Outward bound: strategic for team survival in an organization." Academy of Management journal **33**(2): 334-365.

Anderson, E. (1990). "Two firms, one frontier: On assessing joint venture performance." MIT Sloan Management Review **31**(2): 19.

Anderson, J. C. and J. A. Narus (1990). "A model of distributor firm and manufacturer firm working partnerships." the Journal of Marketing: 42-58.

Andrews, R. (2010). "Organizational social capital, structure and performance." human relations **63**(5): 583-608.

Andriof, J., S. Waddock, B. Husted, S. S. Rahman and V. Ingram (2005). Unfolding stakeholder thinking 2: Relationships, communication, reporting and performance, JSTOR.

Ankrah, S. and A.-T. Omar (2015). "Universities–industry collaboration: A systematic review." Scandinavian Journal of Management **31**(3): 387-408.

Ansari, S., K. Munir and T. Gregg (2012). "Impact at the 'bottom of the pyramid': the role of social capital in capability development and community empowerment." Journal of Management Studies **49**(4): 813-842.

Applegate, L. (2006). Building inter-firm collaborative community, The Firm as a Collaborative Community, New York, Oxford University Press.

Aral, S. and M. Van Alstyne (2011). "The Diversity-Bandwidth Trade-off 1." American Journal of Sociology **117**(1): 90-171.

Arenius, P. M. (2002). Creation of firm-level social capital, its exploitation, and the process of early internationalization, Helsinki University of Technology Helsinki.

Arregle, J. L., M. A. Hitt, D. G. Sirmon and P. Very (2007). "The development of organizational social capital: Attributes of family firms." Journal of management studies **44**(1): 73-95.

Arsenault, J. (1998). "Forging nonprofit alliances." National Alliance for Nonprofit Management and Jossey-Bass: Washington, DC and San Francisco.

Ash, A. M. (1989). "Interorganizational relations and effectiveness in school-business partnerships."

Astley, W. G. (1984). "Toward an appreciation of collective strategy." Academy of management review **9**(3): 526-535.

Athanasoglou, P., M. Delis and C. Staikouras (2006). "Determinants of bank profitability in the South Eastern European region."

Augier, M. and D. J. Teece (2006). "Understanding complex organization: the role of know-how, internal structure, and human behavior in the evolution of capabilities." Industrial and Corporate Change **15**(2): 395-416.

Aulakh, P. S. and E. F. Gencturk (2000). "International principal–agent relationships: Control, governance and performance." Industrial Marketing Management **29**(6): 521-538.

Auster, E. R. (1992). "The relationship of industry evolution to patterns of technological linkages, joint ventures, and direct investment between US and Japan." Management Science **38**(6): 778-792.

Austin, J. E. (2000). "Strategic collaboration between nonprofits and business." Nonprofit and voluntary sector quarterly **29**(suppl 1): 69-97.

Avgerou, C. (2013). "Social mechanisms for causal explanation in social theory based IS research." Journal of the Association for Information systems **14**(8): 399.

Bae, J. and M. G. Insead (2004). "Partner substitutability, alliance network structure, and firm profitability in the telecommunications industry." Academy of Management Journal **47**(6): 843-859.

Bae, J. and J. J. Lawler (2000). "Organizational and HRM strategies in Korea: Impact on firm performance in an emerging economy." Academy of management journal **43**(3): 502-517.

Bagozzi, R. P. (2011). "Measurement and Meaning in Information Systems and Organizational Research: Methodological and Philosophical Foundations." Mis Quarterly **35**(2): 261-292.

Bagozzi, R. P., H. Baumgartner and Y. Yi (1992). "Appraisal processes in the enactment of intentions to use coupons." Psychology & Marketing **9**(6): 469-486.

Bagozzi, R. P., Y. Yi and L. W. Phillips (1991). "Assessing construct validity in organizational research." Administrative science quarterly: 421-458.

Bailey, D. and K. M. Koney (2000). Strategic alliances among health and human services organizations: From affiliations to consolidations, Sage Publications.

Bailey, S. and P. V. Marsden (1999). "Interpretation and interview context: examining the General Social Survey name generator using cognitive methods." Social Networks **21**(3): 287-309.

Baiman, S. and R. E. Verrecchia (1996). "The relation among capital markets, financial disclosure, production efficiency, and insider trading." Journal of accounting research: 1-22.

Baird, I. S., M. A. Lyles and J. B. Orris (1993). "Alliances and networks: Cooperative strategies for small businesses." American Journal of Business **8**(1): 17-24.

Baker, D. D. and J. B. Cullen (1993). "Administrative reorganization and configurational context: The contingent effects of age, size, and change in size." Academy of Management Journal **36**(6): 1251-1277.

Baker, G., R. Gibbons and K. J. Murphy (2002). "Relational contracts in strategic alliances." Unpublished working paper, Harvard University, MIT, and University of Southern California.

Baker, M. (2000). "Career concerns and staged investment: evidence from the venture capital industry." Unpublished working paper, Harvard University.

Baker, W. E. (1990). "Market networks and corporate behavior." American journal of sociology: 589-625.

Bakos, J. Y. and E. Brynjolfsson (1993). "From vendors to partners: Information technology and incomplete contracts in buyer-supplier relationships." Journal of Organizational Computing and Electronic Commerce **3**(3): 301-328.

Baldwin, T. T., M. D. Bedell and J. L. Johnson (1997). "The social fabric of a team-based MBA program: Network effects on student satisfaction and performance." Academy of management journal **40**(6): 1369-1397.

Balkundi, P., Z. Barsness and J. H. Michael (2009). "Unlocking the influence of leadership network structures on team conflict and viability." Small Group Research **40**(3): 301-322.

Barabási, A.-L. and R. Albert (1999). "Emergence of scaling in random networks." science **286**(5439): 509-512.

Barber, B. (1983). "The logic and limits of trust."

Barclay, D., C. Higgins and R. Thompson (1995). "The partial least squares (PLS) approach to causal modeling: Personal computer adoption and use as an illustration." Technology studies **2**(2): 285-309.

Barkema, H. G. and F. Vermeulen (1997). "What differences in the cultural backgrounds of partners are detrimental for international joint ventures?" Journal of international business studies: 845-864.

Barnard, C. I. (1938). "The functions of theexecutive." Cambridge, Massachussetts: Harvard University.

Barney, J. (1991). "Firm resources and sustained competitive advantage." Journal of management **17**(1): 99-120.

Barney, J. B. (1996). "The resource-based theory of the firm." Organization science **7**(5): 469-469.

Barney, J. B. and M. H. Hansen (1994). "Trustworthiness as a source of competitive advantage." Strategic management journal **15**(S1): 175-190.

BarNir, A. and K. A. Smith (2002). "Interfirm alliances in the small business: The role of social networks." Journal of small Business management **40**(3): 219-232.

Baron, R. A. and G. D. Markman (2003). "Beyond social capital: The role of entrepreneurs' social competence in their financial success." Journal of business venturing **18**(1): 41-60.

Baron, R. M. and D. A. Kenny (1986). "The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations." Journal of personality and social psychology **51**(6): 1173.

Basel-Committee (2006). "Basel committee on banking supervision." The New Basel Capital Accord. Bank for International Settlements, Basle (April 2003).

Baskerville, R. and A. T. Wood-Harper (1996). A taxonomy of action research methods, Institut for Informatik og Økonomistyring, Handelshøjskolen i København.

Bass, B. M., B. J. Avolio, D. I. Jung and Y. Berson (2003). "Predicting unit performance by assessing transformational and transactional leadership." Journal of applied psychology **88**(2): 207.

Basu, S. (2004). "E-government and developing countries: an overview." International Review of Law, Computers & Technology **18**(1): 109-132.

Baum, J. A., T. Calabrese and B. S. Silverman (2000). "Don't go it alone: Alliance network composition and startups' performance in Canadian biotechnology." Strategic management journal: 267-294.

Bayo-Moriones, A. and F. Lera-López (2007). "A firm-level analysis of determinants of ICT adoption in Spain." Technovation **27**(6): 352-366.

Beggs, J. J., V. A. Haines and J. S. Hurlbert (1996). "Revisiting the Rural-Urban Contrast: Personal Networks in Nonmetropolitan and Metropolitan Settings." Rural sociology **61**(2): 306-325.

Bell, G. G. (2005). "Clusters, networks, and firm innovativeness." Strategic management journal **26**(3): 287-295.

Belliveau, M. A., C. A. O'Reilly and J. B. Wade (1996). "Social capital at the top: Effects of social similarity and status on CEO compensation." Academy of management Journal **39**(6): 1568-1593.

Bellon, B. and J. Niosi (2001). "Institutionalist theories and inter-firm alliances: the transaction cost, competence and evolutionary debate revisited." Current sociology **49**(4): 67-84.

Bensaou, M. (1997). "Interorganizational cooperation: the role of information technology an empirical comparison of US and Japanese supplier relations." Information Systems Research **8**(2): 107-124.

Berger, A. N., T. Kick, M. Koetter and K. Schaeck (2013). "Does it pay to have friends? Social ties and executive appointments in banking." Journal of Banking & Finance **37**(6): 2087-2105.

Berger, A. N. and G. F. Udell (1995). "Relationship lending and lines of credit in small firm finance." Journal of business: 351-381.

Berkman, L. F., T. Glass, I. Brissette and T. E. Seeman (2000). "From social integration to health: Durkheim in the new millennium." Social science & medicine **51**(6): 843-857.

Berle, A. A. and G. G. C. Means (1991). The modern corporation and private property, Transaction publishers.

Bevc, C. A., A. N. Barlau and N. A. Passanante (2009). "Mapping convergence points in the initial emergency response to 9/11." Disasters **33**(4): 786-808.

Bhatnagar, S. (2003). "Transparency and corruption: Does e-government help?" DRAFT Paper prepared for the compilation of CHRI.

Bhattacharya, C. B. and S. Sen (2003). "Consumer-company identification: A framework for understanding consumers' relationships with companies." Journal of marketing **67**(2): 76-88.

Biggart, N. W. and R. Delbridge (2004). "Systems of exchange." Academy of management review **29**(1): 28-49.

Biostein, S. (1983). "Coordination Dimensions Scale: A Tool to Assess Interorganizational Relationships, The." J. Soc. & Soc. Welfare **10**: 424.

Bitner, J. W. and R. A. Goddard (1992). Successful bank asset/liability management: A guide to the future beyond GAP, University of Texas Press.

Blau, P. M. (1964). Exchange and power in social life, Transaction Publishers.

Bleeke, J. and D. Ernst (1990). "The way to win in cross-border alliances." Harvard business review **69**(6): 127-135.

Bleeke, J. and D. Ernst (1993). "Collaborate to compete." Using Strategic Alliances and Acquisitions in the Global Marketplace, New York.

Boisot, M. and J. Child (1988). "The iron law of fiefs: Bureaucratic failure and the problem of governance in the Chinese economic reforms." Administrative Science Quarterly: 507-527.

Bolino, M. C., W. H. Turnley and J. M. Bloodgood (2002). "Citizenship behavior and the creation of social capital in organizations." Academy of management review **27**(4): 505-522.

Bolland, J. M. (1988). "Sorting out centrality: An analysis of the performance of four centrality models in real and simulated networks." Social networks **10**(3): 233-253.

Bollen, K. A. (1984). "Multiple indicators: Internal consistency or no necessary relationship?" Quality and Quantity **18**(4): 377-385.

Bøllingtoft, A. and J. P. Ulhøi (2005). "The networked business incubator—leveraging entrepreneurial agency?" Journal of business venturing **20**(2): 265-290.

Boot, A. W. and A. V. Thakor (1994). "Moral hazard and secured lending in an infinitely repeated credit market game." International Economic Review: 899-920.

Borgatti, S. P. (2005). "Centrality and network flow." Social networks **27**(1): 55-71.

Borgatti, S. P. (2006). "Identifying sets of key players in a social network." Computational & Mathematical Organization Theory **12**(1): 21-34.

Borgatti, S. P. and M. G. Everett (1992). "Notions of position in social network analysis." Sociological methodology: 1-35.

Borgatti, S. P. and M. G. Everett (1997). "Network analysis of 2-mode data." Social networks **19**(3): 243-269.

Borgatti, S. P. and M. G. Everett (2006). "A graph-theoretic perspective on centrality." Social networks **28**(4): 466-484.

Borgatti, S. P. and P. C. Foster (2003). "The network paradigm in organizational research: A review and typology." Journal of management **29**(6): 991-1013.

Borgatti, S. P. and D. S. Halgin (2011). "On network theory." Organization Science **22**(5): 1168-1181.

Borgatti, S. P., C. Jones and M. G. Everett (1998). "Network measures of social capital." Connections **21**(2): 27-36.

Borgatti, S. P., A. Mehra, D. J. Brass and G. Labianca (2009). "Network analysis in the social sciences." science **323**(5916): 892-895.

Borgida, E., J. L. Sullivan, A. Oxendine, M. S. Jackson, E. Riedel and A. Gangl (2002). "Civic culture meets the digital divide: The role of community electronic networks." Journal of Social Issues **58**(1): 125-141.

Borys, B. and D. B. Jemison (1989). "Hybrid arrangements as strategic alliances: Theoretical issues in organizational combinations." Academy of management review **14**(2): 234-249.

Boschma, R. (2005). "Proximity and innovation: a critical assessment." Regional studies **39**(1): 61-74.

Boschma, R. A. and A. L. Ter Wal (2007). "Knowledge networks and innovative performance in an industrial district: the case of a footwear district in the South of Italy." Industry and Innovation **14**(2): 177-199.

Boss, M., H. Elsinger, M. Summer and S. Thurner 4 (2004). "Network topology of the interbank market." Quantitative Finance **4**(6): 677-684.

Boudreau, M.-C., D. Gefen and D. W. Straub (2001). "Validation in information systems research: a state-of-the-art assessment." MIS quarterly: 1-16.

Bourdieu, P. (1985). "The social space and the genesis of groups." Theory and society **14**(6): 723-744.

Bourdieu, P. (1986). The forms of capital Handbook of theory and research for the sociology of education (pp. 241–258), New York: Greenwood.

Bourdieu, P. and L. J. Wacquant (1992). An invitation to reflexive sociology, University of Chicago press.

Bouty, I. (2000). "Interpersonal and interaction influences on informal resource exchanges between R&D researchers across organizational boundaries." Academy of Management Journal **43**(1): 50-65.

Braa, K. and R. Vidgen (1999). "Interpretation, intervention, and reduction in the organizational laboratory: a framework for in-context information system research." Accounting, Management and Information Technologies **9**(1): 25-47.

Bradach, J. L. and R. G. Eccles (1989). "Price, authority, and trust: From ideal types to plural forms." Annual review of sociology **15**(1): 97-118.

Bragdon, J. and J. Marlin (1972). "ls Pollution Profitable." Risk management **19**(4): 9-18.

Braithwaite, J., J. I. Westbrook, G. Ranmuthugala, F. Cunningham, J. Plumb, J. Wiley, D. Ball, S. Huckson, C. Hughes and B. Johnston (2009). "The development, design, testing, refinement, simulation and application of an evaluation framework for communities of practice and social-professional networks." BMC Health Services Research **9**(1): 162.

Brandenburger, A. M. and B. J. Nalebuff (2011). Co-opetition, Crown Business.

Brass, D. J. (1985). "Men's and women's networks: A study of interaction patterns and influence in an organization." Academy of Management journal **28**(2): 327-343.

Brass, D. J. and M. E. Burkhardt (1992). "Centrality and power in organizations." Networks and organizations: Structure, form, and action **191**: 215.

Brewer, M. B. (2003). "Optimal distinctiveness, social identity, and the self."

Brown, J. S. and P. Duguid (2001). "Knowledge and organization: A social-practice perspective." Organization science **12**(2): 198-213.

Brown, T. J. and P. A. Dacin (1997). "The company and the product: Corporate associations and consumer product responses." The Journal of Marketing: 68-84.

Brüderl, J. and P. Preisendörfer (1998). "Network support and the success of newly founded business." Small business economics **10**(3): 213-225.

Bruhn, M., D. Georgi and K. Hadwich (2008). "Customer equity management as formative second-order construct." Journal of Business Research **61**(12): 1292-1301.

Bruneel, J., P. d'Este and A. Salter (2010). "Investigating the factors that diminish the barriers to university–industry collaboration." Research policy **39**(7): 858-868.

Brunetto, Y. and R. Farr-Wharton (2007). "The moderating role of trust in SME owner/managers' decision-making about collaboration." Journal of Small Business Management **45**(3): 362-387.

Brusoni, S. (2005). "The limits to specialization: problem solving and coordination in 'modular networks'." Organization Studies **26**(12): 1885-1907.

Bryman, A. and E. Bell (2015). Business research methods, Oxford University Press, USA.

Brynjolfsson, E., T. W. Malone, V. Gurbaxani and A. Kambil (1994). "Does information technology lead to smaller firms?" Management Science **40**(12): 1628-1644.

Bstieler, L. and M. Hemmert (2015). "The effectiveness of relational and contractual governance in new product development collaborations: Evidence from Korea." Technovation **45**: 29-39.

Bstieler, L., M. Hemmert and G. Barczak (2015). "Trust Formation in University–Industry Collaborations in the US Biotechnology Industry: IP Policies, Shared Governance, and Champions*,†." Journal of Product Innovation Management **32**(1): 111-121.

Buchner, D. M. and T. W. Findley (1991). "Research in Physical Medicine and Rehabilitation: VIII. Preliminary Data Analysis." American journal of physical medicine & rehabilitation **70**(1): S68-S83.

Buckley, P. J. and M. C. Casson (1998). "Analyzing foreign market entry strategies: Extending the internalization approach." Journal of international business studies **29**(3): 539-561.

Bucklin, L. P. and S. Sengupta (1993). "Organizing successful co-marketing alliances." The Journal of Marketing: 32-46.

Burgers, W. P., C. W. Hill and W. C. Kim (1993). "A theory of global strategic alliances: The case of the global auto industry." Strategic management journal **14**(6): 419-432.

Burrell, G. and G. Morgan (1979). Sociological paradigms and organisational analysis, london: Heinemann.

Burt, R. S. (1984). "Network items and the general social survey." Social networks **6**(4): 293-339.

Burt, R. S. (1992). "Structural hole." Harvard Business School Press, Cambridge, MA.

Burt, R. S. (1993). "The social structure of competition." Explorations in economic sociology **65**: 103.

Burt, R. S. (1997). "The contingent value of social capital." Administrative science quarterly: 339-365.

Burt, R. S. (2000). "The network structure of social capital." Research in organizational behavior **22**: 345-423.

Burt, R. S. (2002). "The social capital of structural holes." The new economic sociology: Developments in an emerging field: 148-190.

Burt, R. S. (2004). "Structural holes and good ideas 1." American journal of sociology **110**(2): 349-399.

Burt, R. S. (2005). Brokerage and closure: An introduction to social capital, Oxford university press.

Burt, R. S. (2009). Structural holes: The social structure of competition, Harvard university press.

Burt, R. S. and M. Knez (1995). "Kinds of third-party effects on trust." Rationality and society **7**(3): 255-292.

Burt, R. S., N. Nohria and R. Eccles (1992). "Networks and organizations: structure, form and action." Networks and organizations: structure, form and action.

Butler, P., T. W. Hall, A. M. Hanna, L. Mendonca, B. Auguste, J. Manyika and A. Sahay (1997). "A revolution in interaction." McKinsey quarterly: 4-23.

Byrne, B. (2010). "Multivariate applications series." Structural equation modeling with AMOS: Basic concepts, applications, and programming (2nd ed.). New York: Routledge/Taylor & Francis Group.

Cabello-Medina, C., Á. López-Cabrales and R. Valle-Cabrera (2011). "Leveraging the innovative performance of human capital through HRM and social capital in Spanish firms." The International Journal of Human Resource Management **22**(04): 807-828.

Calabrese, A. and M. Borchert (1996). "Prospects for electronic democracy in the United States: rethinking communication and social policy." Media Culture and Society **18**: 249-268.

Caldwell, C. and S. E. Clapham (2003). "Organizational trustworthiness: An international perspective." Journal of business ethics **47**(4): 349-364.

Camarinha-Matos, L. M. and H. Afsarmanesh (1999). Tendencies and general requirements for virtual enterprises. Infrastructures for virtual enterprises, Springer**:** 15-30.

Camps, S. and P. Marques (2014). "Exploring how social capital facilitates innovation: The role of innovation enablers." Technological Forecasting and Social Change **88**: 325-348.

Cannon, J. P. and W. D. Perreault Jr (1999). "Buyer-seller relationships in business markets." Journal of marketing research: 439-460.

Capello, R. and A. Faggian (2005). "Collective learning and relational capital in local innovation processes." Regional studies **39**(1): 75-87.

Carletti, E. (2004). "The structure of bank relationships, endogenous monitoring, and loan rates." Journal of Financial Intermediation **13**(1): 58-86.

Carley, K. M. (2002). "Smart agents and organizations of the future." The handbook of new media **12**: 206-220.

Carley, K. M. (2003). Dynamic network analysis, Citeseer.

Carley, K. M. (2003). Dynamic network analysis. Dynamic Social Network Modeling and Analysis: Workshop Summary and Papers. R. Breiger, K. M. Carley and P. Pattison. Washington, DC, Comittee on Human Factors, National Research Council 133–145.

Carley, K. M. and J. Reminga (2004). Ora: Organization risk analyzer, DTIC Document.

Carr, A. S. and L. R. Smeltzer (2002). "The relationship between information technology use and buyer-supplier relationships: an exploratory analysis of the buying firm's perspective." Engineering Management, IEEE Transactions on **49**(3): 293-304.

Carr, L. T. (1994). "The strengths and weaknesses of quantitative and qualitative research: what method for nursing?" Journal of advanced nursing **20**(4): 716-721.

Carrington, P. J., J. Scott and S. Wasserman (2005). Models and methods in social network analysis, Cambridge university press.

Carroll, A. B. (1991). "The pyramid of corporate social responsibility: Toward the moral management of organizational stakeholders." Business horizons **34**(4): 39-48.

Carter, N. M., M. Williams and P. D. Reynolds (1997). "Discontinuance among new firms in retail: The influence of initial resources, strategy, and gender." Journal of business venturing **12**(2): 125-145.

Cartwright, D. and F. Harary (1956). "Structural balance: a generalization of Heider's theory." Psychological review **63**(5): 277.

Casciaro, T. and M. J. Piskorski (2005). "Power imbalance, mutual dependence, and constraint absorption: A closer look at resource dependence theory." Administrative science quarterly **50**(2): 167-199.

Cassel, C., P. Hackl and A. Westlund (1999). "PLS for estimating latent variable quality structures: finite sample robustness properties." Journal of Applied Statistics **26**(4): 435-446.

Cassel, C., P. Hackl and A. H. Westlund (1999). "Robustness of partial least-squares method for estimating latent variable quality structures." Journal of applied statistics **26**(4): 435-446.

Casson, M. C. (1995). Organization of International Business: Studies in the Economics of Trust, Edward Elgar Publishing, Incorporated.

Catturani, I. and R. Venkat (2014). "Optimal Interest Rates in Cooperative Banks with Non-member Customers."

Cavaye, J. (2004). "Governance and community engagement: The Australian experience." Participatory governance: Planning, conflict mediation and public decision making in civil society: 85-102.

Cenfetelli, R. T. and G. Bassellier (2009). "Interpretation of formative measurement in information systems research." Mis Quarterly: 689-707.

Chacar, A. S. and M. B. Lieberman (2003). Organizing for technological innovation in the US pharmaceutical industry. Geography and Strategy, Emerald Group Publishing Limited**:** 317-340.

Chae, B., H. R. Yen and C. Sheu (2005). "Information technology and supply chain collaboration: Moderating effects of existing relationships between partners." Engineering Management, IEEE Transactions on **52**(4): 440-448.

Chaharbaghi, K., A. Adcroft, R. Willis, E. Todeva and D. Knoke (2005). "Strategic alliances and models of collaboration." Management Decision **43**(1): 123-148.

Champagne, C. and L. Kryzanowski (2006). Do Internationally Cross-listed Non US Firms Obtain More Favorable Syndicated Loan Terms?, HEC Montréal, Centre de recherche en e-finance.

Chan, M., I. Woon and A. Kankanhalli (2005). "Perceptions of information security in the workplace: linking information security climate to compliant behavior." Journal of information privacy and security **1**(3): 18-41.

Chan, S. H., J. W. Kensinger, A. J. Keown and J. D. Martin (1997). "Do strategic alliances create value?" Journal of financial economics **46**(2): 199-221.

Chandler, G. N. and S. H. Hanks (1994). "Founder competence, the environment, and venture performance." Entrepreneurship: Theory and Practice **18**(3): 77-90.

Chatfield, C. and A. J. Collins (1980). Introduction. Introduction to Multivariate Analysis, Springer**:** 3-17.

Chatterjee, D. (2006). A Theoretical and Empirical Examination of the Antecedents and Outcomes of Business-to-business Information Systems Choices and Use, ProQuest.

Chatterjee, M. and S. A. Ali (2006). Designing a Scalable Supply Chain Management and Coordination Framework. IIE Annual Conference. Proceedings, Institute of Industrial Engineers-Publisher.

Chawla, R. and S. Bhatnagar (2001). "Bhoomi: Online delivery of land titles in Karnataka, India." Web Document.

Chen, S., X. Ni and J. Y. Tong (2015). "Gender diversity in the boardroom and risk management: A case of R&D investment." Journal of Business Ethics: 1-23.

Chen, W. (2007). "Does the colour of the cat matter? The red hat strategy in China's private enterprises." Management and Organization Review **3**(1): 55-80.

Chen, Z. and T. W. Ross (2000). "Strategic alliances, shared facilities, and entry deterrence." The RAND Journal of Economics: 326-344.

Chin, W. (2000). Partial least squares for IS researchers: an overview and presentation of recent advances using the PLS approach. ICIS.

Chin, W. W. (1998). Commentary: Issues and opinion on structural equation modeling, JSTOR.

Chin, W. W. (1998). "The partial least squares approach to structural equation modeling." Modern methods for business research **295**(2): 295-336.

Chin, W. W. (2001). "PLS-Graph user's guide." CT Bauer College of Business, University of Houston, USA **15**.

Chin, W. W. (2010). How to write up and report PLS analyses. Handbook of partial least squares, Springer**:** 655-690.

Chin, W. W. and J. Dibbern (2010). "An introduction to a permutation based procedure for multi-group PLS analysis: Results of tests of differences on simulated data and a cross cultural analysis of the sourcing of information system services between Germany and the USA." Handbook of partial least squares: 171-193.

Chin, W. W., B. L. Marcolin and P. R. Newsted (2003). "A partial least squares latent variable modeling approach for measuring interaction effects: Results from a Monte Carlo simulation study and an electronic-mail emotion/adoption study." Information systems research **14**(2): 189-217.

Chin, W. W. and P. R. Newsted (1999). "Structural equation modeling analysis with small samples using partial least squares." Statistical strategies for small sample research **2**: 307-342.

Chin, W. W. and P. A. Todd (1995). "On the use, usefulness, and ease of use of structural equation modeling in MIS research: a note of caution." MIS quarterly: 237-246.

Chou, Y. K. (2006). "Three simple models of social capital and economic growth." The Journal of Socio-Economics **35**(5): 889-912.

Chow, S. and R. Holden (1997). "Toward an understanding of loyalty: the moderating role of trust." Journal of managerial Issues: 275-298.

Chung, L. H. and P. T. Gibbons (1997). "Corporate Entrepreneurship The Roles of Ideology and Social Capital." Group & Organization Management **22**(1): 10-30.

Chung, S. A., H. Singh and K. Lee (2000). "Complementarity, status similarity and social capital as drivers of alliance formation." Strategic management journal **21**(1): 1-22.

Chung, S. H., T. A. Byrd, B. R. Lewis and F. N. Ford (2005). "An empirical study of the relationships between IT infrastructure flexibility, mass customization, and business performance." ACM SIGMIS Database **36**(3): 26-44.

Clark, D. D., C. Partridge, J. C. Ramming and J. T. Wroclawski (2003). A knowledge plane for the internet. Proceedings of the 2003 conference on Applications, technologies, architectures, and protocols for computer communications, ACM.

Clark, L. S. (2003). "Challenges of social good in the world of Grand Theft Auto and Barbie: A case study of a community computer center for youth." New Media & Society **5**(1): 95-116.

Clarkson, M. E. (1995). "A stakeholder framework for analyzing and evaluating corporate social performance." Academy of management review **20**(1): 92-117.

Clegg, S. and K. McNulty (2002). "Partnership working in delivering social inclusion: organizational and gender dynamics." Journal of Education Policy **17**(5): 587-601.

Coase, R. H. (1937). "The nature of the firm." economica **4**(16): 386-405.

Cocco, J. F., F. J. Gomes and N. C. Martins (2009). "Lending relationships in the interbank market." Journal of Financial Intermediation **18**(1): 24-48.

Coghlan, D. (2004). "Action research in the academy: Why and whither? Reflections on the changing nature of research1." Irish Journal of Management **25**(2): 1.

Cohen, J. (1988). "The effect size index: d." Statistical power analysis for the behavioral sciences **2**: 284-288.

Cohen, L., L. Manion and K. Morrison (2013). Research methods in education, Routledge.

Cohen, S. S. and G. Fields (1999). "Social capital and capital gains in Silicon Valley." California management review **41**(2): 108-130.

Cohen, W. M. and D. A. Levinthal (1990). "Absorptive capacity: A new perspective on learning and innovation." Administrative science quarterly: 128-152.

Cole, J. R. and H. Zuckerman (1984). "The productivity puzzle." Advances in Motivation and Achievement. Women in Science. JAI Press, Greenwich, CT.

Cole, M. (1998). Cultural psychology: A once and future discipline, Harvard University Press.

Coleman, J. S. (1988). "Social capital in the creation of human capital." American journal of sociology: S95-S120.

Coleman, J. S. (1990). "Norm-generating structures." The limits of rationality: 250-273.

Combs, J. G., T. Russell Crook and C. L. Shook (2005). The dimensionality of organizational performance and its implications for strategic management research. Research methodology in strategy and management, Emerald Group Publishing Limited**:** 259-286.

Comer, J. M., R. E. Plank, D. A. Reid and E. B. Pullins (1999). "Methods in Sales Research: Perceived Trust in Business-to-Business Sales: A New Measure." Journal of Personal Selling & Sales Management **19**(3): 61-71.

Commission, P. (2003). Social capital: reviewing the concept and its policy implications, EconWPA.

Conner, K. R. and C. K. Prahalad (1996). "A resource-based theory of the firm: Knowledge versus opportunism." Organization science **7**(5): 477-501.

Contractor, F. J. and P. Lorange (1988). "Why should firms cooperate? The strategy and economics basis for cooperative ventures." Cooperative strategies in international business: 3-30.

Contractor, F. J. and P. Lorange (2002). "The growth of alliances in the knowledge-based economy." International Business Review **11**(4): 485-502.

Cook, A. S. and D. J. Weigel (1983). "Relation and Crisis: Perceived Sources of Support." Family Relations **32**(2): 267-273.

Corman, S. R., T. Kuhn, R. D. McPhee and K. J. Dooley (2002). "Studying Complex Discursive Systems." Human communication research **28**(2): 157-206.

Cornell, B. and A. C. Shapiro (1987). "Corporate stakeholders and corporate finance." Financial management: 5-14.

Costa, R. and T. Menichini (2013). "A multidimensional approach for CSR assessment: The importance of the stakeholder perception." Expert Systems with Applications **40**(1): 150-161.

Costenbader, E. and T. W. Valente (2003). "The stability of centrality measures when networks are sampled." Social networks **25**(4): 283-307.

Craig, B. and G. Von Peter (2014). "Interbank tiering and money center banks." Journal of Financial Intermediation **23**(3): 322-347.

Creswell, J. W. (2009). Editorial: Mapping the field of mixed methods research, SAGE Publications Sage CA: Los Angeles, CA.

Creswell, J. W., A. C. Klassen, V. L. Plano Clark and K. C. Smith (2011). "Best practices for mixed methods research in the health sciences." Bethesda (Maryland): National Institutes of Health: 2094-2103.

Creswick, N. and J. I. Westbrook (2010). "Social network analysis of medication advice-seeking interactions among staff in an Australian hospital." International journal of medical informatics **79**(6): e116-e125.

Cricelli, L., M. Grimaldi and N. L. Ghiron (2009). "Modelling the competition of an HNO versus an MVNO in the mobile telecommunications industry." International Journal of Technology, Policy and Management **9**(3): 277-295.

Cropper, S. (2008). The Oxford handbook of inter-organizational relations, Oxford University Press on Demand.

Cross, R., S. P. Borgatti and A. Parker (2001). "Beyond answers: dimensions of the advice network." Social networks **23**(3): 215-235.

Cummings, J. N. and R. Cross (2003). "Structural properties of work groups and their consequences for performance." Social networks **25**(3): 197-210.

Cummings, L. L. and P. Bromiley (1996). "The organizational trust inventory (OTI)." Trust in organizations: Frontiers of theory and research **302**(330): 39-52.

Cummings, T. G. (1984). "Transorganizational development." Research in organizational behavior **6**: 367-422.

Currall, S. C. and T. A. Judge (1995). "Measuring trust between organizational boundary role persons." Organizational behavior and Human Decision processes **64**(2): 151-170.

Dacin, M. T., M. J. Ventresca and B. D. Beal (1999). "The embeddedness of organizations: Dialogue & directions." Journal of management **25**(3): 317-356.

Dahl Rendtorff, J. and J. Mattsson (2012). "Ethics in the bank internet encounter: an explorative study." Journal of Information, Communication and Ethics in Society **10**(1): 36-51.

Dakhli, M. and D. De Clercq (2004). "Human capital, social capital, and innovation: a multi-country study." Entrepreneurship & regional development **16**(2): 107-128.

Danzon, P. M., S. Nicholson and N. S. Pereira (2005). "Productivity in pharmaceutical–biotechnology R&D: the role of experience and alliances." Journal of health economics **24**(2): 317-339.

Das, T. and N. Rahman (2010). "Determinants of partner opportunism in strategic alliances: a conceptual framework." Journal of Business and Psychology **25**(1): 55-74.

Das, T. K. and R. Kumar (2011). "Regulatory focus and opportunism in the alliance development process." Journal of Management **37**(3): 682-708.

Das, T. K. and B.-S. Teng (1998). "Between trust and control: Developing confidence in partner cooperation in alliances." Academy of management review **23**(3): 491-512.

Das, T. K. and B.-S. Teng (2000). "A resource-based theory of strategic alliances." Journal of management **26**(1): 31-61.

Das, T. K. and B.-S. Teng (2002). "Alliance constellations: A social exchange perspective." Academy of management review **27**(3): 445-456.

Dasgupta, A. (2004). "Financial contagion through capital connections: A model of the origin and spread of bank panics." Journal of the European Economic Association **2**(6): 1049-1084.

Daskalakis, S. and J. Mantas (2008). "Evaluating the impact of a service-oriented framework for healthcare interoperability." Studies in health technology and informatics **136**: 285.

DCS, S. L. "http://www.statistics.gov.lk/."

De Leeuw, E. D. and D. A. Dillman (2008). International handbook of survey methodology, Taylor & Francis.

de Sola Pool, I. and M. Kochen (1978). "Contacts and influence." Social networks **1**(1): 5-51.

De Vries, C. G. (2005). "The simple economics of bank fragility." Journal of banking & finance **29**(4): 803-825.

DeFillippi, R. J. and M. B. Arthur (1998). "Paradox in project-based enterprise: The case of film making." California management review **40**(2): 125-139.

Degenne, A. and M. Forsé (1999). Introducing social networks, Sage.

Degli Antoni, G. and L. Sacconi (2011). Does virtuous circle between social capital and CSR exist? A “network of games” model and some empirical evidence.

Degryse, H. and G. Nguyen (2004). "Interbank exposure: An empirical examination of systemic risk in the belgian banking system."

Degryse, H. and P. Van Cayseele (2000). "Relationship lending within a bank-based system: Evidence from European small business data." Journal of financial Intermediation **9**(1): 90-109.

Dhanaraj, C. and A. Parkhe (2006). "Orchestrating innovation networks." Academy of management review **31**(3): 659-669.

Di Marco, M. K., J. E. Taylor and P. Alin (2010). "Emergence and role of cultural boundary spanners in global engineering project networks." Journal of Management in Engineering **26**(3): 123-132.

Diamantopoulos, A., P. Riefler and K. P. Roth (2008). "Advancing formative measurement models." Journal of business research **61**(12): 1203-1218.

Diamantopoulos, A. and J. A. Siguaw (2006). "Formative versus reflective indicators in organizational measure development: A comparison and empirical illustration." British Journal of Management **17**(4): 263-282.

Diamond, D. W. and R. E. Verrecchia (1991). "Disclosure, liquidity, and the cost of capital." The journal of Finance **46**(4): 1325-1359.

Dijkstra, T. K. and J. Henseler (2015). "Consistent partial least squares path modeling." MIS quarterly= Management information systems quarterly **39**(2): 297-316.

DiMaggio, P. (1994). "Culture and economy." The handbook of economic sociology **27**.

Domholt, E. (2005). Rehabilitation research, St Louis, MO: Elsevier Saunders.

Doney, P. M. and J. P. Cannon (1997). "An examination of the nature of trust in buyer-seller relationships." the Journal of Marketing: 35-51.

Doreian, P. (1974). "On the connectivity of social networks." Journal of Mathematical Sociology **3**(2): 245-258.

Doz, Y. L. and G. Hamel (1998). Alliance advantage: The art of creating value through partnering, Harvard Business Press.

Doz, Y. L., P. M. Olk and P. S. Ring (2000). "Formation processes of R&D consortia: Which path to take? Where does it lead?" Strategic management journal: 239-266.

Dubini, P. and H. Aldrich (1991). "Personal and extended networks are central to the entrepreneurial process." Journal of Business Venturing **6**(5): 305-313.

Duffy, M. E. (1985). "Designing nursing research: the qualitative-quantitative debate." Journal of Advanced Nursing **10**(3): 225-232.

Dunning, J. H. (2015). Reappraising the eclectic paradigm in an age of alliance capitalism. The Eclectic Paradigm, Springer**:** 111-142.

Durlauf, S. N. and H. P. Young (2001). "The new social economics." Social dynamics: 1-14.

Durlauf, S. N. and H. P. Young (2004). Social dynamics, Mit Press.

Dussauge, P. and B. Garrette (1995). "Determinants of success in international strategic alliances: Evidence from the global aerospace industry." Journal of International Business Studies **26**(3): 505-530.

Dussauge, P., B. Garrette and W. Mitchell (2000). "Learning from competing partners: outcomes and durations of scale and link alliances in Europe, North America and Asia." Strategic management journal: 99-126.

Duysters, G. and J. Hagedoorn (1995). "Strategic Groups and Inter-Firm Networks In International High-Tech Industries." Journal of Management Studies **32**(3): 359-381.

Duysters, G., G. Kok and M. Vaandrager (1999). "Crafting successful strategic technology partnerships." R&D Management **29**(4): 343-351.

Dwyer, F. R., P. H. Schurr and S. Oh (1987). "Developing buyer-seller relationships." The Journal of marketing: 11-27.

Dyer, J. H. (1996). "Specialized supplier networks as a source of competitive advantage: Evidence from the auto industry." Strategic management journal: 271-291.

Dyer, J. H. and K. Nobeoka (2000). "Creating and managing a high-performance knowledge-sharing network: the Toyota case." Strategic management journal: 345-367.

Dyer, J. H. and H. Singh (1998). "The relational view: Cooperative strategy and sources of interorganizational competitive advantage." Academy of management review **23**(4): 660-679.

Eagle, N. and A. S. Pentland (2006). "Reality mining: sensing complex social systems." Personal and ubiquitous computing **10**(4): 255-268.

Eccles, R. G. and D. B. Crane (1987). "Managing through networks in investment banking." California management review **30**(1): 176-195.

Economist (2005). "The Economist Intelligence Unit's quality-of-life index." Retrieved July **2005**(17): 245-277.

Eden, C. (2004). "Analyzing cognitive maps to help structure issues or problems." European Journal of Operational Research **159**(3): 673-686.

Eden, S. (1996). Environmental issues and business: implications of a changing agenda, John Wiley & Sons Ltd.

Edge, D. (1979). "Quantitative measures of communication in science: A critical review." History of science **17**(2): 102-134.

Edwards, J. R. and R. P. Bagozzi (2000). "On the nature and direction of relationships between constructs and measures." Psychological methods **5**(2): 155.

Edwards, R. (2004). "Measuring social capital: An Australian framework and indicators." Information Paper. Canberra: Australian Bureau of Statistics.

Efron, B. and R. J. Tibshirani (1994). An introduction to the bootstrap, CRC press.

Eisenhardt, K. M. (1989). "Agency theory: An assessment and review." Academy of management review **14**(1): 57-74.

Eisenhardt, K. M. and F. M. Santos (2002). "Knowledge-based view: A new theory of strategy." Handbook of strategy and management **1**(139-164).

Eisenhardt, K. M. and C. B. Schoonhoven (1996). "Resource-based view of strategic alliance formation: Strategic and social effects in entrepreneurial firms." organization Science **7**(2): 136-150.

Elg, U. (2007). "Market Orientation as Inter-firm Cooperation:: An International Study of the Grocery Sector." European Management Journal **25**(4): 283-297.

Ellegaard, C. and P. H. Andersen (2015). "The process of resolving severe conflict in buyer–supplier relationships." Scandinavian Journal of Management **31**(4): 457-470.

Ellison, N. B., C. Steinfield and C. Lampe (2007). "The benefits of Facebook "friends:" Social capital and college students' use of online social network sites." Journal of Computer-Mediated Communication **12**(4): 1143-1168.

Elsas, R. and J. P. Krahnen (1998). "Is relationship lending special? Evidence from credit-file data in Germany." Journal of Banking & Finance **22**(10): 1283-1316.

Ely, R. J. (1995). "The power in demography: Women's social constructions of gender identity at work." Academy of Management journal **38**(3): 589-634.

Employment, E. C. D.-G. f. (2001). Promoting a European Framework for Corporate Social Responsibility: Green Paper, Office for Official Publications of the European Communities.

Erickson, B. (2003). "Social networks: The value of variety." Contexts **2**(1): 25-31.

Ermilova, E. and H. Afsarmanesh (2007). "Modeling and management of profiles and competencies in VBEs." Journal of Intelligent Manufacturing **18**(5): 561-586.

Euler, L. (1956). The seven bridges of Konigsberg, Wm. Benton.

Evered, R. and M. R. Louis (1981). "Alternative perspectives in the organizational sciences:"inquiry from the inside" and "inquiry from the outside"." Academy of management review **6**(3): 385-395.

Everett, M. G. and S. P. Borgatti (1999). "The centrality of groups and classes." The Journal of mathematical sociology **23**(3): 181-201.

Evermann, J. and M. Tate (2009). "Building theory from quantitative studies, or, how to fit SEM models."

Fang, E. (2011). "The effect of strategic alliance knowledge complementarity on new product innovativeness in China." Organization Science **22**(1): 158-172.

Faulkner, D. and M. De Rond (2000). Cooperative strategy: economic, business and organizational issues, Oxford University Press Oxford, UK.

Faust, K. (1997). "Centrality in affiliation networks." Social networks **19**(2): 157-191.

Fehr, E. and S. Gächter (2000). "Fairness and retaliation: The economics of reciprocity." The journal of economic perspectives **14**(3): 159-181.

Feld, S. and W. C. Carter (1998). "Foci of activity as changing contexts for friendship." Placing friendship in context: 136-152.

Felzensztein, C. and E. Gimmon (2007). "The influence of culture and size upon inter-firm marketing cooperation: a case study of the salmon farming industry." Marketing Intelligence & Planning **25**(4): 377-393.

Ferlander, S. (2007). "The importance of different forms of social capital for health." Acta Sociologica **50**(2): 115-128.

Ferlie, E., L. Fitzgerald, M. Wood and C. Hawkins (2005). "The nonspread of innovations: the mediating role of professionals." Academy of management journal **48**(1): 117-134.

Fettke, P., P. Loos and J. Zwicker (2005). Business process reference models: Survey and classification. International Conference on Business Process Management, Springer.

Field, A. (2009). Discovering statistics using SPSS, Sage publications.

Fitzek, F. H. and M. D. Katz (2006). Cooperation in wireless networks: principles and applications, Springer.

Fornell, C. and J. Cha (1994). "Partial least squares." Advanced methods of marketing research **407**(3): 52-78.

Fornell, C. and D. Larcker (1987). "A second generation of multivariate analysis: Classification of methods and implications for marketing research." Review of marketing **1**: 407-450.

Fornell, C. and D. F. Larcker (1981). "Evaluating structural equation models with unobservable variables and measurement error." Journal of marketing research: 39-50.

Foster, C. and R. Heeks (2013). "Innovation and scaling of ICT for the bottom-of-the-pyramid." Journal of Information Technology **28**(4): 296-315.

Fountain, J. (1997). Social capital: A Key Enabler of Innovation in Science and Technology. IN LM Branscomb & J. Keller (Eds.) Investing in Innovation: Toward A consensus strategy for Federal Technology Policy, Cambridge, The MIT Press.

Fountain, J. E. (1997). Social capital: A Key Enabler of Innovation in Science and Technology. Investing in Innovation: Toward A consensus strategy for Federal Technology Policy. L.M.Branscomb and J.Keller. Cambridge, The MIT Press.

Frazier, G. L., R. E. Spekman and C. R. O'neal (1988). "Just-in-time exchange relationships in industrial markets." The Journal of Marketing: 52-67.

Freeman, C. (1982). "Innovation and long cycles of economic development." SEMINÁRIO INTERNACIONAL. Universidade Estadual de Campinas, Campinas: 1-13.

Freeman, C. (1991). "Networks of innovators: a synthesis of research issues." Research policy **20**(5): 499-514.

Freeman, C., J. Clark and L. Soete (1982). Unemployment and technical innovation: a study of long waves and economic development, Burns & Oates.

Freeman, C. and L. Soete (1990). "Fast structural change and slow productivity change: some paradoxes in the economics of information technology." Structural Change and Economic Dynamics **1**(2): 225-242.

Freeman, L. C. (1978). "Centrality in social networks conceptual clarification." Social networks **1**(3): 215-239.

Freeman, L. C., D. Roeder and R. R. Mulholland (1979). "Centrality in social networks: II. Experimental results." Social networks **2**(2): 119-141.

Freeman, R. E. and W. M. Evan (1990). "Corporate governance: A stakeholder interpretation." Journal of behavioral economics **19**(4): 337-359.

Freixas, X., B. M. Parigi and J.-C. Rochet (2000). "Systemic risk, interbank relations, and liquidity provision by the central bank." Journal of money, credit and banking: 611-638.

Frey, B. B., J. H. Lohmeier, S. W. Lee and N. Tollefson (2006). "Measuring collaboration among grant partners." American Journal of Evaluation **27**(3): 383-392.

Friedkin, N. E. (1991). "Theoretical foundations for centrality measures." American journal of Sociology **96**(6): 1478-1504.

Friedlander, M. J., and Gurney, G (1981). Handbook of Successful Franchising.

Fu, J.-R. (2006). "VisualPLS–Partial Least Square (PLS) Regression–An Enhanced GUI for LVPLS (PLS 1.8 PC) Version 1.04." National Kaohsiung University of Applied Sciences, Taiwan. URL http://www2. kuas. edu. tw/prof/fred/vpls.

Fuentes-García, F. J., J. M. Núñez-Tabales and R. Veroz-Herradón (2008). "Applicability of corporate social responsibility to human resources management: perspective from Spain." Journal of Business Ethics **82**(1): 27-44.

Fukuyama, F. (1995). "Social capital and the global economy: A redrawn map of the world." Foreign affairs **74**(5): 89-103.

Fukuyama, F. (1999). "Social capital and civil society."

Gabarro, J. J. (1978). "The development of trust, influence, and expectations." Interpersonal behavior: Communication and understanding in relationships **290**: 303.

Gabbay, S. M. and R. T. Leenders (1999). CSC: The structure of advantage and disadvantage. Corporate social capital and liability, Springer**:** 1-14.

Gabbay, S. M. and E. W. Zuckerman (1998). "Social capital and opportunity in corporate R&D: The contingent effect of contact density on mobility expectations." Social Science Research **27**(2): 189-217.

Gajda, R. (2004). "Utilizing collaboration theory to evaluate strategic alliances." American journal of evaluation **25**(1): 65-77.

Galliers, R. (1993). "Research issues in information systems." Journal of information technology **8**(2): 92.

Galperin, B. L., T. R. Lituchy, M. Acquaah, T. Bewaji and D. Ford (2014). "Leadership and motivation in the African diaspora: The United States and Canada." Canadian Journal of Administrative Sciences/Revue Canadienne des Sciences de l'Administration **31**(4): 257-269.

Ganesan, S. (1994). "Determinants of long-term orientation in buyer-seller relationships." the Journal of Marketing: 1-19.

Garcia-Morales, V. J., F. J. Llorens-Montes and A. J. Verdú-Jover (2006). "Antecedents and consequences of organizational innovation and organizational learning in entrepreneurship." Industrial Management & Data Systems **106**(1): 21-42.

Garg, G. and C. Kothari (2014). "Research Methodology. Methods and Techniques." New Age International Publishers. New Delhi-110002.

Garson, G. D. (2016). Partial Least Squares Regression and Structural Equation Models. 2016 Edition (Statistical Associates Blue Book Series 10), Statistical Associates Publishing, USA.

Gassenheimer, J. B. and C. Manolis (2001). "The influence of product customization and supplier selection on future intentions: The mediating effects of salesperson and organizational trust." Journal of Managerial Issues: 418-435.

Gay, B. and B. Dousset (2005). "Innovation and network structural dynamics: Study of the alliance network of a major sector of the biotechnology industry." Research policy **34**(10): 1457-1475.

Geddes, M. (2000). "Tackling social exclusion in the European Union? The limits to the new orthodoxy of local partnership." International journal of urban and regional research **24**(4): 782-800.

Gefen, D. (2000). "E-commerce: the role of familiarity and trust." Omega **28**(6): 725-737.

Gefen, D., D. Straub and M.-C. Boudreau (2000). "Structural equation modeling and regression: Guidelines for research practice." Communications of the association for information systems **4**(1): 7.

Geisser, S. (1974). "A predictive approach to the random effect model." Biometrika: 101-107.

Geletkanycz, M. A. and D. C. Hambrick (1997). "The external ties of top executives: Implications for strategic choice and performance." Administrative Science Quarterly: 654-681.

Georg, C.-P. (2010). The effect of the interbank network structure on contagion and financial stability, Working Papers on Global Financial Markets.

George, D. (2011). SPSS for windows step by step: A simple study guide and reference, 17.0 update, 10/e, Pearson Education India.

Gerlach, M. L. (1992). Alliance capitalism: The social organization of Japanese business, Univ of California Press.

Ghebregiorgis, F. and A. Atewebrhan (2016). "Measurement of bank profitability, risk and efficiency: The case of the Commercial Bank of Eritrea and Housing and Commerce Bank of Eritrea." African Journal of Business Management **10**(22): 554-562.

Ghoshal, S. and C. A. Bartlett (1994). "Linking organizational context and managerial action: The dimensions of quality of management." Strategic Management Journal **15**(S2): 91-112.

Ghoshal, S., H. Korine and G. Szulanski (1994). "Interunit communication in multinational corporations." Management Science **40**(1): 96-110.

Ghoshal, S. and P. Moran (1996). "Bad for practice: A critique of the transaction cost theory." Academy of management Review **21**(1): 13-47.

Gillespie, K. and H. J. Teegen (1995). "Market liberalization and international alliance formation: The Mexican paradigm." The Columbia Journal of World Business **30**(4): 58-69.

Gittell, R. and A. Vidal (1998). Community organizing: Building social capital as a development strategy, Sage publications.

Giuliani, E. and M. Bell (2005). "The micro-determinants of meso-level learning and innovation: evidence from a Chilean wine cluster." Research policy **34**(1): 47-68.

Glaeser, E. L. and J. E. Kohlhase (2004). "Cities, regions and the decline of transport costs." Papers in regional Science **83**(1): 197-228.

Glaser, B. G. and A. L. Strauss (1967). The discovery of grounded theory: strategies for qualitative theory, Chicago (IL): Aldine Publishing Co.

Gloor, P. A., J. Krauss, S. Nann, K. Fischbach and D. Schoder (2009). Web science 2.0: Identifying trends through semantic social network analysis. Computational Science and Engineering, 2009. CSE'09. International Conference on, IEEE.

Gneiser, M., J. Heidemann, M. Klier, A. Landherr and F. Probst (2012). "Valuation of online social networks taking into account users' interconnectedness." Information Systems and E-Business Management **10**(1): 61-84.

Gnyawali, D. R., J. He and R. Madhavan (2006). "Impact of co-opetition on firm competitive behavior: An empirical examination." Journal of Management **32**(4): 507-530.

Gnyawali, D. R. and R. Madhavan (2001). "Cooperative networks and competitive dynamics: A structural embeddedness perspective." Academy of Management review **26**(3): 431-445.

Gnyawali, D. R. and B.-J. R. Park (2011). "Co-opetition between giants: Collaboration with competitors for technological innovation." Research Policy **40**(5): 650-663.

Goddard, T. (2005). "Corporate citizenship: Creating social capacity in developing countries." Development in Practice **15**(3-4): 433-438.

Goles, T. and R. Hirschheim (2000). "The paradigm is dead, the paradigm is dead… long live the paradigm: the legacy of Burrell and Morgan." Omega **28**(3): 249-268.

Gomes-Casseres, B., J. Hagedoorn and A. B. Jaffe (2006). "Do alliances promote knowledge flows?" Journal of Financial Economics **80**(1): 5-33.

Gomez, T. and H.-H. M. Hsiao (2004). Chinese enterprise, transnationalism and identity, Routledge.

González-Rodríguez, M. R., M. C. Díaz-Fernández and B. Simonetti (2015). "The social, economic and environmental dimensions of corporate social responsibility: The role played by consumers and potential entrepreneurs." International Business Review **24**(5): 836-848.

Gouldner, A. W. (1960). "The norm of reciprocity: A preliminary statement." American sociological review: 161-178.

Grandori, A. and G. Soda (1995). "Inter-firm networks: antecedents, mechanisms and forms." Organization studies **16**(2): 183-214.

Granovetter, M. (1983). "The strength of weak ties: A network theory revisited." Sociological theory **1**(1): 201-233.

Granovetter, M. (1985). "Economic action and social structure: The problem of embeddedness." American journal of sociology **91**(3): 481-510.

Granovetter, M. (1992). "Economic institutions as social constructions: a framework for analysis." Acta sociologica **35**(1): 3-11.

Granovetter, M. S. (1973). "The strength of weak ties." American journal of sociology: 1360-1380.

Grant, R. M. (1996). "Toward a knowledge-based theory of the firm." Strategic management journal **17**(S2): 109-122.

Graves, S. B. and S. A. Waddock (1994). "Institutional owners and corporate social performance." Academy of Management journal **37**(4): 1034-1046.

Gray, B. (1989). "Collaborating: Finding common ground for multiparty problems."

Greening, D. W. and D. B. Turban (2000). "Corporate social performance as a competitive advantage in attracting a quality workforce." Business & Society **39**(3): 254-280.

Grewal, R., J. A. Cote and H. Baumgartner (2004). "Multicollinearity and measurement error in structural equation models: Implications for theory testing." Marketing Science **23**(4): 519-529.

Grimshaw, D., S. Vincent and H. Willmott (2002). "Going privately: partnership and outsourcing in UK public services." Public Administration **80**(3): 475-502.

Grootaert, C. (2003). Assessing empowerment in the ECA region. Measuring Empowerment: Cross-Disciplinary Perspectives" workshop, ECA Region, Washington DC., World Bank, February.

Grootaert, C. (2004). Measuring social capital: An integrated questionnaire, World Bank Publications.

Grootaert, C. and D. Narayan (2004). "Local institutions, poverty and household welfare in Bolivia." World development **32**(7): 1179-1198.

Grootaert, C. and T. Van Bastelaer (2002). The role of social capital in development: An empirical assessment, Cambridge University Press.

Grover, V., J. T. Teng and K. D. Fiedler (2002). "Investigating the role of information technology in building buyer-supplier relationships." Journal of the Association for Information Systems **3**(1): 7.

Growiec, K., S. Vilhelmsdóttir and D. Cairns (2012). "Social capital and the financial crisis: The case of Iceland."

Guare, J. (1990). Six degrees of separation: A play, Vintage.

Guba, E. G. and Y. S. Lincoln (1994). "Competing paradigms in qualitative research." Handbook of qualitative research **2**(163-194): 105.

Gul, S., F. Irshad and K. Zaman (2011). "Factors affecting bank profitability in Pakistan." The Romanian Economic Journal **39**(14): 61-89.

Gulati, R. (1995). "Social structure and alliance formation patterns: A longitudinal analysis." Administrative science quarterly: 619-652.

Gulati, R. (1998). "Alliances and networks." Strategic management journal: 293-317.

Gulati, R. (1999). "Network location and learning: The influence of network resources and firm capabilities on alliance formation." Strategic management journal **20**(5): 397-420.

Gulati, R. and M. Gargiulo (1999). "Where do interorganizational networks come from? 1." American journal of sociology **104**(5): 1439-1493.

Gulati, R., N. Nohria and A. Zaheer (2000). "Strategic networks." Strategic management journal: 203-215.

Habib, M. A. and P. Mella-Barral (2006). "Which way to grow? Merging, allying, or buying assets." European Finance Association.

Hagedoorn, J. (1993). "Understanding the rationale of strategic technology partnering: Nterorganizational modes of cooperation and sectoral differences." Strategic management journal **14**(5): 371-385.

Hagedoorn, J. (1995). "Strategic technology partnering during the 1980s: trends, networks and corporate patterns in non-core technologies." Research Policy **24**(2): 207-231.

Hagedoorn, J. (2006). "Understanding the cross-level embeddedness of interfirm partnership formation." Academy of management review **31**(3): 670-680.

Hagedoorn, J. and G. Duysters (2002). "External sources of innovative capabilities: the preferences for strategic alliances or mergers and acquisitions." Journal of management studies **39**(2): 167-188.

Hagedoorn, J., H. v. Kranenburg and R. N. Osborn (2003). "Joint patenting amongst companies–exploring the effects of inter-firm R&D partnering and experience." Managerial and Decision Economics **24**(2-3): 71-84.

Hagedoorn, J. and J. Schakenraad (1990). "Inter-firm partnerships and co-operative strategies in core technologies."

Hair, J. F. (2010). Multivariate data analysis, Pearson College Division.

Hair, J. F., R. E. Anderson, B. J. Babin and W. C. Black (2010). Multivariate data analysis: A global perspective, Pearson Upper Saddle River, NJ.

Hair, J. F., G. T. M. Hult, C. Ringle and M. Sarstedt (2016). A primer on partial least squares structural equation modeling (PLS-SEM), Sage Publications.

Hair, J. F. and B. Lukas (2014). Marketing research, McGraw-Hill Education Australia.

Hair, J. F., C. M. Ringle and M. Sarstedt (2011). "PLS-SEM: Indeed a silver bullet." Journal of Marketing theory and Practice **19**(2): 139-152.

Hair, J. F., C. M. Ringle and M. Sarstedt (2013). "Editorial-partial least squares structural equation modeling: Rigorous applications, better results and higher acceptance." Long Range Planning **46**(1-2): 1-12.

Hair, J. F., M. Sarstedt, L. Hopkins and V. G. Kuppelwieser (2014). "Partial least squares structural equation modeling (PLS-SEM) An emerging tool in business research." European Business Review **26**(2): 106-121.

Hair, J. F., M. Sarstedt, T. M. Pieper and C. M. Ringle (2012). "The use of partial least squares structural equation modeling in strategic management research: a review of past

practices and recommendations for future applications." Long range planning **45**(5): 320-340.

Håkansson, H. and I. Snehota (1995). "Developing relationships in business markets." London: International Thompson.

Hall, B. and K. Howard (2008). "A synergistic approach: Conducting mixed methods research with typological and systemic design considerations." Journal of mixed methods research **2**(3): 248-269.

Hall, E. T. (1983). The Dance of Life: The Other Dimension of Time. Doubleday, Garden City, New York.

Hall, M. and L. Weiss (1967). "Firm size and profitability." The Review of Economics and Statistics: 319-331.

Hamel, G., Y. L. Doz and C. K. Prahalad (1989). "Collaborate with your competitors and win." Harvard business review **67**(1): 133-139.

Hampton, K. and B. Wellman (2003). "Neighboring in Netville: How the Internet supports community and social capital in a wired suburb." City & Community **2**(4): 277-311.

Hampton, K. N., C.-j. Lee and E. J. Her (2011). "How new media affords network diversity: Direct and mediated access to social capital through participation in local social settings." new media & society: 1461444810390342.

Handfield, R. B. and C. Bechtel (2002). "The role of trust and relationship structure in improving supply chain responsiveness." Industrial marketing management **31**(4): 367-382.

Hanneman, R. A. and M. Riddle (2005). Introduction to social network methods, University of California Riverside.

Hansen, B. E. (1999). "Threshold effects in non-dynamic panels: Estimation, testing, and inference." Journal of econometrics **93**(2): 345-368.

Hansmann, K.-W. and C. M. Ringle (2004). "SmartPLS manual." University of Hamburg, Hamburg.

Hargadon, A. and R. I. Sutton (1997). "Technology brokering and innovation in a product development firm." Administrative science quarterly: 716-749.

Harhoff, D. and T. Körting (1998). "Lending relationships in Germany–Empirical evidence from survey data." Journal of Banking & Finance **22**(10): 1317-1353.

Harper, R. and M. Kelly (2003). "Measuring social capital in the United Kingdom." London: Office for National Statistics.

Harpham, T. (2008). The measurement of community social capital through surveys. Social capital and health, Springer**:** 51-62.

Harrison, D. (2004). "Is a long-term business relationship an implied contract? Two views of relationship disengagement." Journal of Management Studies **41**(1): 107-125.

Harvey, M., M. M. Novicevic and G. Garrison (2005). "Global virtual teams: A human resource capital architecture." The International Journal of Human Resource Management **16**(9): 1583-1599.

Harvie, C. and B.-C. Lee (2002). The role of SMEs in national economies in East Asia, Edward Elgar Publishing.

Hau, H. and M. Thum (2009). "Subprime crisis and board (in-) competence: private versus public banks in Germany." Economic Policy **24**(60): 701-752.

Hawe, P. and L. Ghali (2008). "Use of social network analysis to map the social relationships of staff and teachers at school." Health Education Research **23**(1): 62-69.

Hawe, P., C. Webster and A. Shiell (2004). "A glossary of terms for navigating the field of social network analysis." Journal of epidemiology and community health **58**(12): 971-975.

Hayes, N. and C. Westrup (2012). "Context and the processes of ICT for development." Information and organization **22**(1): 23-36.

Heck, E. v. and P. Vervest (2007). "Smart business networks: how the network wins." Communications of the ACM **50**(6): 28-37.

Heide, J. B. and A. S. Miner (1992). "The shadow of the future: Effects of anticipated interaction and frequency of contact on buyer-seller cooperation." Academy of management journal **35**(2): 265-291.

Heider, F. (1946). "Attitudes and cognitive organization." The Journal of psychology **21**(1): 107-112.

Heidl, R. and C. Phelps (2010). The Influence of Interorganizational Embeddedness on Multipartner Alliance Stability. Academy of Management Proceedings, Academy of Management.

Helper, S. (1990). "Comparative supplier relations in the US and Japanese auto industries: an exit/voice approach." Business and Economic history: 153-162.

Heng, H., W. McGeorge and M. Loosemore (2005). "Beyond strategy: exploring the brokerage role of facilities manager in hospitals." Journal of health organization and management **19**(1): 16-31.

Henseler, J. (2007). "A new and simple approach to multi-group analysis in partial least squares path modeling."

Henseler, J. (2012). PLS-MGA: A non-parametric approach to partial least squares-based multi-group analysis. Challenges at the interface of data analysis, computer science, and optimization, Springer**:** 495-501.

Henseler, J. and W. W. Chin (2010). "A comparison of approaches for the analysis of interaction effects between latent variables using partial least squares path modeling." Structural Equation Modeling **17**(1): 82-109.

Henseler, J., T. K. Dijkstra, M. Sarstedt, C. M. Ringle, A. Diamantopoulos, D. W. Straub, D. J. Ketchen, J. F. Hair, G. T. M. Hult and R. J. Calantone (2014). "Common beliefs and reality about PLS comments on Rönkkö and Evermann (2013)." Organizational Research Methods: 1094428114526928.

Henseler, J. and G. Fassott (2010). Testing moderating effects in PLS path models: An illustration of available procedures. Handbook of partial least squares, Springer**:** 713-735.

Henseler, J., C. M. Ringle and M. Sarstedt (2012). "12 Using partial least squares path modeling in advertising research: basic concepts and recent issues." Handbook of research on international advertising: 252.

Henseler, J., C. M. Ringle and M. Sarstedt (2015). "A new criterion for assessing discriminant validity in variance-based structural equation modeling." Journal of the Academy of Marketing Science **43**(1): 115-135.

Henseler, J., C. M. Ringle and R. R. Sinkovics (2009). "The use of partial least squares path modeling in international marketing." Advances in international marketing **20**(1): 277-319.

Hill, G. W. (1982). "Group versus individual performance: Are N+ 1 heads better than one?" Psychological bulletin **91**(3): 517.

Hill, R. C. and D. Hellriegel (1994). "Critical contingencies in joint venture management: Some lessons from managers." Organization science **5**(4): 594-607.

Hirschheim, R., H. K. Klein and K. Lyytinen (1995). Information systems development and data modeling: conceptual and philosophical foundations, Cambridge University Press.

Hitt, L. M. (1999). "Information technology and firm boundaries: Evidence from panel data." Information Systems Research **10**(2): 134-149.

Hitt, M. A., R. E. Hoskisson, R. A. Johnson and D. D. Moesel (1996). "The market for corporate control and firm innovation." Academy of management journal **39**(5): 1084-1119.

Hitt, M. A., H.-U. Lee and E. Yucel (2002). "The importance of social capital to the management of multinational enterprises: Relational networks among Asian and Western firms." Asia Pacific Journal of Management **19**(2-3): 353-372.

Hoekman, J., K. Frenken and F. Van Oort (2009). "The geography of collaborative knowledge production in Europe." The Annals of Regional Science **43**(3): 721-738.

Hofstede, G., B. Neuijen, D. D. Ohayv and G. Sanders (1990). "Measuring organizational cultures: A qualitative and quantitative study across twenty cases." Administrative science quarterly: 286-316.

Hogue, T. (1993). "Community-based collaboration: Community wellness multiplied." Oregon Center for Community Leadership, Oregon State University.

Homans, G. C. (1958). "Social behavior as exchange." American journal of sociology **63**(6): 597-606.

Homburg, C. and A. Giering (1996). "Conceptualization and operationalization of complex constructs." Marketing ZFP **18**(1): 5-24.

Honig, B. and J. Lampel (2000). "Interorganizational entrepreneurship in a global arena." The International Journal of Organizational Analysis **8**(4): 343-363.

Hoogeweegen, M. R., D. W. van Liere, P. H. Vervest, L. H. van der Meijden and I. de Lepper (2006). "Strategizing for mass customization by playing the business networking game." Decision Support Systems **42**(3): 1402-1412.

Hossain, L., K. Chung and S. Murshed (2007). "Exploring temporal communication through social networks." Human-Computer Interaction–INTERACT 2007: 19-30.

Hu, L. t. and P. M. Bentler (1999). "Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives." Structural equation modeling: a multidisciplinary journal **6**(1): 1-55.

Hui, B. S. and H. Wold (1982). "Consistency and consistency at large of partial least squares estimates." Systems under indirect observation, part II: 119-130.

Hulland, J. (1999). "Use of partial least squares (PLS) in strategic management research: A review of four recent studies." Strategic management journal: 195-204.

Human, S. E. and K. G. Provan (2000). "Legitimacy building in the evolution of small-firm multilateral networks: A comparative study of success and demise." Administrative Science Quarterly **45**(2): 327-365.

Humphrey, J. and H. Schmitz (1998). "Trust and inter-firm relations in developing and transition economies." The journal of development studies **34**(4): 32-61.

Hunter, S. M., I. A. Vizelberg and G. S. Berenson (1991). "Identifying mechanisms of adoption of tobacco and alcohol use among youth: The Bogalusa heart study." Social Networks **13**(1): 91-104.

Husted, K. and S. Michailova (2009). "Socialization tactics as a governance mechanism in R&D collaborations." Knowledge Governance: Processes and Perspectives: 191-219.

Huysman, M. and V. Wulf (2006). "IT to support knowledge sharing in communities, towards a social capital analysis." Journal of information technology **21**(1): 40-51.

Hwang, G. J. and C. C. Tsai (2011). "Research trends in mobile and ubiquitous learning: A review of publications in selected journals from 2001 to 2010." British Journal of Educational Technology **42**(4): E65-E70.

Hwang, H., N. K. Malhotra, Y. Kim, M. A. Tomiuk and S. Hong (2010). "A comparative study on parameter recovery of three approaches to structural equation modeling." Journal of Marketing Research **47**(4): 699-712.

Ibarra, H. (1992). "Homophily and differential returns: Sex differences in network structure and access in an advertising firm." Administrative science quarterly: 422-447.

Ibarra, H. (1993). "Network centrality, power, and innovation involvement: Determinants of technical and administrative roles." Academy of Management journal **36**(3): 471-501.

Ibarra, H. (1993). "Personal networks of women and minorities in management: A conceptual framework." Academy of management Review **18**(1): 56-87.

Ibarra, H., M. Kilduff and W. Tsai (2005). "Zooming in and out: Connecting individuals and collectivities at the frontiers of organizational network research." Organization science **16**(4): 359-371.

Im, B. (2003). Strengthening Government-Citizen Connections: A Case Study of Korea. Anti-Corruption Symposium 2001: The Role of On-line Procedures in Promoting Good Governance.

Im, B. and J. Jung (2001). Using ICTs to strengthen government transparency and relations with citizens in Korea. meeting of the OECD Secretariat in Paris.

Indicators, U.-C. I. (2010). "Core ICT Indicators 2010." United Nations-Partnership on Measuring ICT for Development.

Indro, D. C. and M. Richards (2007). "The determinants of foreign partner's equity ownership in Southeast Asian joint ventures." International Business Review **16**(2): 177-206.

Inglehart, R., M. Basanez, J. Diez-Medrano, L. Halman and R. Luijkx (2000). "World values surveys and European values surveys, 1981-1984, 1990-1993, and 1995-1997." Ann Arbor-Michigan, Institute for Social Research, ICPSR version.

Inkpen, A. C. (1996). "Creating knowledge through collaboration." California Management Review **39**(1): 123-140.

Inkpen, A. C. and P. W. Beamish (1997). "Knowledge, bargaining power, and the instability of international joint ventures." Academy of management review **22**(1): 177-202.

Inkpen, A. C. and E. W. Tsang (2005). "Social capital, networks, and knowledge transfer." Academy of management review **30**(1): 146-165.

Institute, L. (2015). Legatum Prosperity Index. United Kingdom Legatum Institute.

Isham, J., T. Kelly and S. Ramaswamy (2002). "Social capital and well-being in developing countries: an introduction." Social capital and economic development: Well-being in developing countries: 3-17.

Itami, H. and T. Roehl (1987). "Mobilizing intangible assets." Cambridge (Mass.).

Jaccard, J. and R. Turrisi (2003). Interaction effects in multiple regression, Sage.

Jacobides, M. G. and S. Billinger (2006). "Designing the boundaries of the firm: From "make, buy, or ally" to the dynamic benefits of vertical architecture." Organization science **17**(2): 249-261.

Jaeger, R. G. and T. R. Halliday (1998). "On confirmatory versus exploratory research." Herpetologica: S64-S66.

James, L. R. and J. M. Brett (1984). "Mediators, moderators, and tests for mediation." Journal of Applied Psychology **69**(2): 307.

Jarvis, C. B., S. B. MacKenzie and P. M. Podsakoff (2003). "A critical review of construct indicators and measurement model misspecification in marketing and consumer research." Journal of consumer research **30**(2): 199-218.

Jayaram, J. and S. K. Vickery (1998). "Supply-based strategies, human resource initiatives, procurement leadtime, and firm performance." Journal of Supply Chain Management **34**(4): 12-24.

Jennejohn, M. C. (2008). "Collaboration, innovation, and contract design." Stan. JL Bus. & Fin. **14**: 83.

Jennings, D. F., K. Artz, L. Murray Gillin and C. Christodouloy (2000). "Determinants of trust in global strategic alliances: AMRAD and the Australian biomedical industry." Competitiveness Review: An International Business Journal **10**(1): 25-44.

Jha, A. and J. Cox (2015). "Corporate social responsibility and social capital." Journal of Banking & Finance **60**: 252-270.

Jia, F. and C. Rutherford (2010). "Mitigation of supply chain relational risk caused by cultural differences between China and the West." The International Journal of Logistics Management **21**(2): 251-270.

Judd, C. M., G. H. McClelland and S. E. Culhane (1995). "Data analysis: Continuing issues in the everyday analysis of psychological data." Annual review of psychology **46**(1): 433-465.

Julien, P. A. and C. Ramangalahy (2003). "Competitive strategy and performance of exporting SMEs: An empirical investigation of the impact of their export information search and competencies." Entrepreneurship Theory and Practice **27**(3): 227-245.

Justin Tan, J. and R. J. Litsschert (1994). "Environment-strategy relationship and its performance implications: An empirical study of the Chinese electronics industry." Strategic management journal **15**(1): 1-20.

Kadushin, C. (1995). "Friendship among the French financial elite." American Sociological Review: 202-221.

Kakihara, M. and C. Sorensen (2002). Mobility: An extended perspective. System Sciences, 2002. HICSS. Proceedings of the 35th Annual Hawaii International Conference on, IEEE.

Kakihara, M. and C. Sorensen (2002). Mobility: An Extended Perspective. 55th Hawaii International Conference on Systems Sciences.

Kale, P. and J. Anand (2006). "The decline of emerging economy joint ventures: The case of India." California Management Review **48**(3): 62-76.

Kale, P., J. H. Dyer and H. Singh (2002). "Alliance capability, stock market response, and long-term alliance success: the role of the alliance function." Strategic Management Journal **23**(8): 747-767.

Kale, P. and H. Singh (1999). ALLIANCE CAPABILITY & SUCCESS: A KNOWLEDGE-BASED APPROACH. Academy of management proceedings, Academy of Management.

Kanter, R. M. (1988). "Three tiers for innovation research." Communication Research **15**(5): 509-523.

Kaplan, B. and J. Maxwell (1994). "Evaluating health care information systems: Methods and applications." Qualitative Research Methods for Evaluating Computer Information Systems. JG Anderson, CE Ayden and SJ Jay. Thousand Oaks, Sage.

Kashlak, R. J., R. Chandran and C. A. Di Benedetto (1998). "Reciprocity in international business: a study of telecommunications alliances and contracts." Journal of International Business Studies **29**(2): 281-304.

Kassler, W. J. and Y. P. Goldsberry (2005). "The New Hampshire Public Health Network: Creating Local Public Health Infrastructure Through Community-Driven Partnerships." Journal of Public Health Management and Practice **11**(2): 150-157.

Katz, J. S. and B. R. Martin (1997). "What is research collaboration?" Research policy **26**(1): 1-18.

Keane, M. (2009). "Creative industries in China: four perspectives on social transformation." International Journal of Cultural Policy **15**(4): 431-443.

Keil, M., B. C. Tan, K.-K. Wei, T. Saarinen, V. Tuunainen and A. Wassenaar (2000). "A cross-cultural study on escalation of commitment behavior in software projects." MIS quarterly: 299-325.

Kendall, K. E., J. E. Kendall and M. M. Kah (2006). "Formulating information and communication technology (ICT) policy through discourse: how internet discussions shape policies on ICTs for developing countries." Information Technology for Development **12**(1): 25-43.

Kettaneh, N., A. Berglund and S. Wold (2005). "PCA and PLS with very large data sets." Computational Statistics & Data Analysis **48**(1): 69-85.

Khrawish, H. A. (2011). "Determinants of commercial banks performance: Evidence from Jordan." International Research Journal of Finance and Economics **81**: 148-159.

Kilduff, M. and W. Tsai (2003). Social networks and organizations, Sage.

Kim, K., K. Jung, K. Chilton and D. Miller (2016). "Strategies of social media use in disaster management: lessons in resilience from Seoul, South Korea." International Journal of Emergency Services **5**(2).

Kim, T.-Y., H. Oh and A. Swaminathan (2006). "Framing interorganizational network change: A network inertia perspective." Academy of Management Review **31**(3): 704-720.

Kim, Y. (2007). "The proportion and social capital of outside directors and their impacts on firm value: Evidence from Korea." Corporate Governance: An International Review **15**(6): 1168-1176.

Kimmelman, J., J. S. Mogil and U. Dirnagl (2014). "Distinguishing between exploratory and confirmatory preclinical research will improve translation." PLoS Biol **12**(5): e1001863.

King, W. R. and J. He (2005). "External validity in IS survey research." Communications of the Association for Information Systems **16**(1): 45.

Kiss, C. and M. Bichler (2008). "Identification of influencers—measuring influence in customer networks." Decision Support Systems **46**(1): 233-253.

Klein, H. K. and M. D. Myers (1999). "A set of principles for conducting and evaluating interpretive field studies in information systems." MIS quarterly: 67-93.

Klein, J. and N. Dawar (2004). "Corporate social responsibility and consumers' attributions and brand evaluations in a product–harm crisis." International Journal of research in Marketing **21**(3): 203-217.

Klenke, K. (2003). "Gender influences in decision-making processes in top management teams." Management Decision **41**(10): 1024-1034.

Kline, R. B. (2010). "Promise and pitfalls of structural equation modeling in gifted research."

Kline, R. B. (2015). Principles and practice of structural equation modeling, Guilford publications.

Knack, S. and P. Keefer (1997). "Does social capital have an economic payoff? A cross-country investigation." The Quarterly journal of economics: 1251-1288.

Knoben, J. and L. A. Oerlemans (2006). "Proximity and inter-organizational collaboration: A literature review." International Journal of Management Reviews **8**(2): 71-89.

Kock, N. (2015). "Common method bias in PLS-SEM: A full collinearity assessment approach." International Journal of e-Collaboration (IJeC) **11**(4): 1-10.

Kogut, B. (1988). "Joint ventures: Theoretical and empirical perspectives." Strategic management journal **9**(4): 319-332.

Kogut, B. (1991). "Joint ventures and the option to expand and acquire." Management science **37**(1): 19-33.

Kogut, B. and U. Zander (1992). "Knowledge of the firm, combinative capabilities, and the replication of technology." Organization science **3**(3): 383-397.

Koka, B. R. and J. E. Prescott (2002). "Strategic alliances as social capital: A multidimensional view." Strategic management journal **23**(9): 795-816.

Kono, C., D. Palmer, R. Friedland and M. Zafonte (1998). "Lost in space: the geography of corporate interlocking directorates 1." American Journal of Sociology **103**(4): 863-911.

Kraatz, M. S. (1998). "Learning by association? Interorganizational networks and adaptation to environmental change." Academy of management journal **41**(6): 621-643.

Krackhardt, D. (1987). "Cognitive social structures." Social networks **9**(2): 109-134.

Krackhardt, D. (1988). "Predicting with networks: Nonparametric multiple regression analysis of dyadic data." Social networks **10**(4): 359-381.

Krackhardt, D. (1990). "Assessing the political landscape: Structure, cognition, and power in organizations." Administrative science quarterly: 342-369.

Krackhardt, D. (1994). "Graph theoretical dimensions of informal organizations." Computational organization theory **89**(112): 123-140.

Krackhardt, D. and K. M. Carley (1998). PCANS model of structure in organizations, Carnegie Mellon University, Institute for Complex Engineered Systems.

Krackhardt, D. and J. R. Hanson (2001). "16 Informal Networks: The Company Behind the Chart." Creative Management: 202.

Krackhardt, D., N. Nohria and B. Eccles (2003). "The strength of strong ties." Networks in the knowledge economy: 82.

Krause, A. and S. Giansante (2012). "Liquidity and Solvency Shocks in a Network Model of Systemic Risk: The Impact of Minimum Capital and Reserve Requirements."

Kraut, R., C. Egido and J. Galegher (1988). Patterns of contact and communication in scientific research collaboration. Proceedings of the 1988 ACM conference on Computer-supported cooperative work, ACM.

Kraut, R., M. Patterson, V. Lundmark, S. Kiesler, T. Mukophadhyay and W. Scherlis (1998). "Internet paradox: A social technology that reduces social involvement and psychological well-being?" American psychologist **53**(9): 1017.

Kreiner, K. and M. Schultz (1993). "Informal collaboration in R & D. The formation of networks across organizations." Organization studies **14**(2): 189-209.

Krishna, A. and N. Uphoff (2002). "Mapping and measuring social capital through assessment of collective action to conserve and develop watersheds in Rajasthan, India." The role of social capital in development: An empirical assessment: 85-124.

Krishnan, R., X. Martin and N. G. Noorderhaven (2006). "When does trust matter to alliance performance?" Academy of Management journal **49**(5): 894-917.

Kuada, J. (2002). "Collaboration between developed and developing country-based firms: Danish-Ghanaian experience." Journal of Business & Industrial Marketing **17**(6): 538-557.

Kuada, J. and O. J. Sørensen (2005). "Facilitated inter-firm collaboration in Ghana: the case of Danida's private-sector development projects." Development in Practice **15**(3-4): 475-489.

Kumar, N. (1996). "The power of trust in manufacturer-retailer relationships." Harvard business review **74**(6): 92-&.

Kumar, N., L. W. Stern and J. C. Anderson (1993). "Conducting interorganizational research using key informants." Academy of management journal **36**(6): 1633-1651.

Kumar, S. and P. Phrommathed (2005). Research methodology, Springer.

Kvasny, L. and M. Keil (2006). "The challenges of redressing the digital divide: A tale of two US cities." Information systems journal **16**(1): 23-53.

Labianca, G. and D. J. Brass (2006). "Exploring the social ledger: Negative relationships and negative asymmetry in social networks in organizations." Academy of Management Review **31**(3): 596-614.

Lagunoff, R. and S. L. Schreft (2001). "A model of financial fragility." Journal of Economic Theory **99**(1-2): 220-264.

Landsberg, C. (2005). "Toward a developmental foreign policy? Challenges for South Africa's diplomacy in the second decade of liberation." Social Research: 723-756.

Lange, O. (1938). "The rate of interest and the optimum propensity to consume." Economica **5**(17): 12-32.

Langlois, R. N. and P. L. Robertson (1992). "Networks and innovation in a modular system: Lessons from the microcomputer and stereo component industries." Research Policy **21**(4): 297-313.

Larson, A. (1992). "Network dyads in entrepreneurial settings: A study of the governance of exchange relationships." Administrative science quarterly: 76-104.

Larson, P. D. and J. D. Kulchitsky (1999). "Logistics improvement programs: The dynamics between people and performance." International Journal of Physical Distribution & Logistics Management **29**(2): 88-103.

Lau, E. and S. Rowlinson (2009). "Interpersonal trust and inter-firm trust in construction projects." Construction Management and Economics **27**(6): 539-554.

Laursen, B., W. M. Bukowski, K. Aunola and J. E. Nurmi (2007). "Friendship moderates prospective associations between social isolation and adjustment problems in young children." Child development **78**(4): 1395-1404.

Lavie, D. (2006). "The competitive advantage of interconnected firms: An extension of the resource-based view." Academy of management review **31**(3): 638-658.

Lavie, D. (2007). "Alliance portfolios and firm performance: A study of value creation and appropriation in the US software industry." Strategic management journal **28**(12): 1187-1212.

Lawshe, C. H. (1975). "A quantitative approach to content validity." Personnel psychology **28**(4): 563-575.

Lazega, E. and P. E. Pattison (1999). "Multiplexity, generalized exchange and cooperation in organizations: a case study." Social networks **21**(1): 67-90.

Leana, C. R. and F. K. Pil (2006). "Social capital and organizational performance: Evidence from urban public schools." Organization Science **17**(3): 353-366.

Leana, C. R. and H. J. Van Buren (1999). "Organizational social capital and employment practices." Academy of management review **24**(3): 538-555.

Lee, C.-J. and D. Kim (2013). "A comparative analysis of the validity of US state-and county-level social capital measures and their associations with population health." Social indicators research **111**(1): 307-326.

Lee, C., K. Lee and J. M. Pennings (2001). "Internal capabilities, external networks, and performance: a study on technology-based ventures." Strategic management journal **22**(6-7): 615-640.

Lee, K.-h., G. Yang and J. L. Graham (2006). "Tension and trust in international business negotiations: American executives negotiating with Chinese executives." Journal of International Business Studies **37**(5): 623-641.

Lee, K.-P. (2007). "Clans for markets: The social organization of inter-firm trading relations in China's automobile industry." The China Quarterly **192**: 876-897.

Lee, S. H. M., J. Cotte and T. J. Noseworthy (2010). "The role of network centrality in the flow of consumer influence." Journal of Consumer Psychology **20**(1): 66-77.

Leonard-Barton, D. and J. L. Doyle (1996). Commercializing technology: imaginative understanding of user needs, Boston: Harvard Business School Press.

Leonard, P. (1984). Personality and ideology: Towards a materialist understanding of the individual, Macmillan.

Lerner, J. and R. Rajan (2006). "NBER Conference on corporate alliances." Journal of Financial Economics **80**(1): 1-3.

Lerner, J., H. Shane and A. Tsai (2003). "Do equity financing cycles matter? Evidence from biotechnology alliances." Journal of Financial Economics **67**(3): 411-446.

Lewis, B. R., G. F. Templeton and T. A. Byrd (2005). "A methodology for construct development in MIS research." European Journal of Information Systems **14**(4): 388-400.

Lewis, J. D. (1990). "Making strategic alliances work." Research-Technology Management **33**(6): 12-15.

Li, D., P. Y. Chau and C. Van Slyke (2010). "A comparative study of individual acceptance of instant messaging in the US and China: A structural equation modeling approach."

Li, S. and J. He (2012). "The impact of bank activities on contagion risk in interbank networks." Advances in Complex Systems **15**(supp02): 1250086.

Li, Y. (2005). "PLS-GUI–Graphic user interface for partial least squares (PLS-PC 1.8)–Version 2.0. 1 beta." University of South Carolina, Columbia, SC.

Lichtenstein, D. R., M. E. Drumwright and B. M. Braig (2004). "The effect of corporate social responsibility on customer donations to corporate-supported nonprofits." Journal of marketing **68**(4): 16-32.

Lin, C., J. Jiang, Y.-J. Wu and C. Chang (2011). "Assessment of commercialization strategy using R&D capability." Industrial Management & Data Systems **111**(3): 341-369.

Lin, N. (1999). "Building a network theory of social capital." Connections **22**(1): 28-51.

Lin, N. (2001). Building a network theory of social capital'in N. Lin, K. Cook, And RS Burt (eds.) Social Capital: Theory and Research, 3-29, New York: Aldine De Gruyter.

Lin, N. (2001). "Guanxi: A conceptual analysis." Contributions in Sociology **133**: 153-166.

Lin, N. (2002). Social capital: A theory of social structure and action, Cambridge university press.

Lin, N. (2008). "A network theory of social capital." The handbook of social capital **50**: 69.

Lin, N. and M. Dumin (1986). "Access to occupations through social ties." Social networks **8**(4): 365-385.

Lin, N., W. M. Ensel and J. C. Vaughn (1981). "Social resources and strength of ties: Structural factors in occupational status attainment." American sociological review: 393-405.

Lin, N. and B. H. Erickson (2010). Social capital: an international research program, Oxford University Press.

Lin, N., Y.-c. Fu and R.-M. Hsung (2001). "Measurement techniques for investigations of social capital." LIN, N.; GRUYTER, A. Social capital: theory and research. New York.

Lindell, M. K. and D. J. Whitney (2001). "Accounting for common method variance in cross-sectional research designs." Journal of applied psychology **86**(1): 114.

Lindsey, L. (2008). "Blurring firm boundaries: The role of venture capital in strategic alliances." The Journal of Finance **63**(3): 1137-1168.

Ling, R., L. Haddon and L. Klamer (2001). The understanding and use of the Internet and the mobile telephone among contemporary Europeans. conference 'e-Usages', Paris.

Lipunga, A. M. (2013). "Corporate social responsibility reporting by commercial banks in annual reports: Evidence from Malawi." International Journal of Business and Social Research **3**(9).

Little, T. D., J. A. Bovaird and K. F. Widaman (2006). "On the merits of orthogonalizing powered and product terms: Implications for modeling interactions among latent variables." Structural Equation Modeling **13**(4): 497-519.

Loch, K. D. and S. Conger (1996). "Evaluating ethical decision making and computer use." Communications of the ACM **39**(7): 74-83.

Lohrke, F. T., G. M. Franklin and C. Frownfelter-Lohrke (2006). "The Internet as an Information Conduit A Transaction Cost Analysis Model of US SME Internet Use." International Small Business Journal **24**(2): 159-178.

Long, J. C., F. C. Cunningham and J. Braithwaite (2013). "Bridges, brokers and boundary spanners in collaborative networks: a systematic review." BMC health services research **13**(1): 158.

Lorange, P., J. Roos and P. S. Brønn (1992). "Building successful strategic alliances." Long Range Planning **25**(6): 10-17.

Lorsch, J., L. Berlowitz and A. Zelleke (2005). Restoring Trust in American Business, American Academy of Arts and Sciences, Cambridge: The MIT Press.

Lowry, P. B. and J. Gaskin (2014). "Partial least squares (PLS) structural equation modeling (SEM) for building and testing behavioral causal theory: When to choose it and how to use it." IEEE Transactions on Professional Communication **57**(2): 123-146.

Lu, X.-H., L.-H. Huang and M. S. Heng (2006). "Critical success factors of inter-organizational information systems—A case study of Cisco and Xiao Tong in China." Information & Management **43**(3): 395-408.

Lu, Y. and J. Yao (2006). "Impact of state ownership and control mechanisms on the performance of group affiliated companies in China." Asia Pacific Journal of Management **23**(4): 485-503.

Luce, R. D. and A. D. Perry (1949). "A method of matrix analysis of group structure." Psychometrika **14**(2): 95-116.

Lui, S. S. and H. y. Ngo (2005). "An action pattern model of inter-firm cooperation." Journal of Management Studies **42**(6): 1123-1153.

Luo, J. D. (2005). "Particularistic trust and general trust: A network analysis in chinese organizations [1]." Management and Organization Review **1**(3): 437-458.

Luo, Y. (1995). "Business strategy, market structure, and performance of international joint ventures: The case of joint ventures in China." MIR: Management International Review: 241-264.

Luo, Y. (2003). "Industrial dynamics and managerial networking in an emerging market: The case of China." Strategic management journal **24**(13): 1315-1327.

Luo, Y. (2007). "A coopetition perspective of global competition." Journal of world business **42**(2): 129-144.

Luo, Y. and M. Chen (1997). "Does guanxi influence firm performance?" Asia Pacific Journal of Management **14**(1): 1-16.

Machauer, A. and M. Weber (2000). Number of bank relationships: An indicator of competition, borrower quality, or just size?, CFS Working Paper.

Macke, J. and E. K. Dilly (2010). "Social capital dimensions in collaborative networks: The role of linking social capital." International Journal of Social Inquiry **3**(2): 121-136.

Macke, J., J. A. R. SARATE and R. V. VALLEJOS (2010). "Collective competence and social capital analysis in collaborative networks." Journal of Systemics, Cybernetics and Informatics **8**(3): 18-23.

Macke, J., R. V. Vallejos, K. Faccin and D. Genari (2013). "Social capital in collaborative networks competitiveness: the case of the Brazilian Wine Industry Cluster." International Journal of Computer Integrated Manufacturing **26**(1-2): 117-124.

Macke, J., R. V. Vallejos and E. D. Toss (2010). "Building inter-organizational social capital instruments to evaluate collaborative networks." iBusiness **2**(01): 67.

MacKenzie, S. B. and P. M. Podsakoff (2012). "Common method bias in marketing: causes, mechanisms, and procedural remedies." Journal of Retailing **88**(4): 542-555.

MacKenzie, S. B., P. M. Podsakoff and C. B. Jarvis (2005). "The problem of measurement model misspecification in behavioral and organizational research and some recommended solutions." Journal of Applied Psychology **90**(4): 710.

MacKinnon, D., A. Cumbers and K. Chapman (2002). "Learning, innovation and regional development: a critical appraisal of recent debates." Progress in human geography **26**(3): 293-311.

Mahmood, M. A., K. Bagchi and T. C. Ford (2004). "On-line shopping behavior: Cross-country empirical research." International Journal of Electronic Commerce **9**(1): 9-30.

Maignan, I. and O. Ferrell (2004). "Corporate social responsibility and marketing: An integrative framework." Journal of the Academy of Marketing science **32**(1): 3-19.

Malhotra, N. K., S. S. Kim and A. Patil (2006). "Common method variance in IS research: A comparison of alternative approaches and a reanalysis of past research." Management science **52**(12): 1865-1883.

Malone, T. W., J. Yates and R. I. Benjamin (1987). "Electronic markets and electronic hierarchies." Communications of the ACM **30**(6): 484-497.

Marcoulides, G. A., W. W. Chin and C. Saunders (2009). "A critical look at partial least squares modeling." Mis Quarterly **33**(1): 171-175.

Markus, M. L. and D. Robey (1988). "Information technology and organizational change: causal structure in theory and research." Management science **34**(5): 583-598.

Marsden, P. V. (1987). "Core discussion networks of Americans." American sociological review: 122-131.

Marsden, P. V. (2002). "Egocentric and sociocentric measures of network centrality." Social networks **24**(4): 407-422.

Masud, M., A. Kaium and M. S. Hossain (2012). "Corporate social responsibility reporting practices in Bangladesh: A study of selected private commercial banks."

Matten, D. and A. Crane (2005). "Corporate citizenship: Toward an extended theoretical conceptualization." Academy of Management review **30**(1): 166-179.

Maurer, I. and M. Ebers (2006). "Dynamics of social capital and their performance implications: Lessons from biotechnology start-ups." Administrative Science Quarterly **51**(2): 262-292.

Mazloomi Khamseh, H. and D. R. Jolly (2008). "Knowledge transfer in alliances: determinant factors." Journal of Knowledge Management **12**(1): 37-50.

McCallister, L. and C. S. Fischer (1978). "A procedure for surveying personal networks." Sociological Methods & Research **7**(2): 131-148.

McCann, P. and F. Van Oort (2009). "Theories of agglomeration and regional economic growth: a historical review." Handbook of regional growth and development theories: 19-32.

McEvily, B. and A. Marcus (2005). "Embedded ties and the acquisition of competitive capabilities." Strategic management journal **26**(11): 1033-1055.

McEvily, B., V. Perrone and A. Zaheer (2003). "Trust as an organizing principle." Organization science **14**(1): 91-103.

Medcof, J. W. (2001). "Resource-based strategy and managerial power in networks of internationally dispersed technology units." Strategic Management Journal **22**(11): 999-1012.

Meeus, M. T., L. A. Oerlemans and J. Hage (2001). "Patterns of interactive learning in a high-tech region." Organization studies **22**(1): 145-172.

Melé, D. (2003). "Organizational humanizing cultures: do they generate social capital?" Journal of Business Ethics **45**(1): 3-14.

Meyers, L. S., G. C. Gamst and A. Guarino (2013). Performing data analysis using IBM SPSS, John Wiley & Sons.

Mingers, J. (2001). "Combining IS research methods: towards a pluralist methodology." Information systems research **12**(3): 240-259.

Mohr, J. and R. Spekman (1994). "Characteristics of partnership success: partnership attributes, communication behavior, and conflict resolution techniques." Strategic management journal **15**(2): 135-152.

Mohr, J. J., R. J. Fisher and J. R. Nevin (1996). "Collaborative communication in interfirm relationships: moderating effects of integration and control." the Journal of Marketing: 103-115.

Möllering, G. (2002). "Perceived trustworthiness and inter-firm governance: empirical evidence from the UK printing industry." Cambridge Journal of Economics: 139-160.

Molm, L. D., G. Peterson and N. Takahashi (2001). "The value of exchange." Social Forces **80**(1): 159-184.

Monge, P. R. and N. S. Contractor (2003). Theories of communication networks, Oxford University Press, USA.

Monteverde, K. and D. J. Teece (1982). "Supplier switching costs and vertical integration in the automobile industry." The Bell Journal of Economics: 206-213.

Moon, J., A. Crane and D. Matten (2005). "Can corporations be citizens? Corporate citizenship as a metaphor for business participation in society." Business Ethics Quarterly **15**(03): 429-453.

Moore, K. R. (1998). "Trust and relationship commitment in logistics alliances: a buyer perspective." International Journal of Purchasing and Materials Management **34**(4): 24-37.

Moran, P. (2005). "Structural vs. relational embeddedness: Social capital and managerial performance." Strategic management journal **26**(12): 1129-1151.

Moran, P. and S. Ghoshal (1996). VALUE CREATION BY FIRMS. Academy of Management Proceedings, Academy of Management.

Morgan, K. and P. Cooke (1998). "The associational economy: firms, regions, and innovation." University of Illinois at Urbana-Champaign's Academy for Entrepreneurial Leadership Historical Research Reference in Entrepreneurship.

Morgan, R. M. and S. D. Hunt (1994). "The commitment-trust theory of relationship marketing." The journal of marketing: 20-38.

Morrison, A. (2008). "Gatekeepers of knowledge within industrial districts: who they are, how they interact." Regional Studies **42**(6): 817-835.

Moses Acquaah, K. A.-G. a. N. Q. N. (2014). Measuring and Valuing Social Capital: A Systematic Review. South Africa, Network for Business Sustainability

Moulaert, F. and F. Sekia (2003). "Territorial innovation models: a critical survey." Regional studies **37**(3): 289-302.

Moussavi, F. and D. Evans (1986). An attributional approach to measuring corporate social performance. Academy of management meetings, San Diego.

Mowery, D. C., J. E. Oxley and B. S. Silverman (1996). "Strategic alliances and interfirm knowledge transfer." Strategic management journal **17**(S2): 77-91.

Muscio, A. and G. Vallanti (2014). "Perceived obstacles to university–industry collaboration: Results from a qualitative survey of Italian academic departments." Industry and Innovation **21**(5): 410-429.

Muthuri, J. N., D. Matten and J. Moon (2009). "Employee volunteering and social capital: Contributions to corporate social responsibility." British Journal of Management **20**(1): 75-89.

Mutschke, P. (2008). Zentralitätsanomalien und Netzwerkstruktur. Ein Plädoyer für einen „engeren "Netzwerkbegriff und ein community-orientiertes Zentralitätsmodell. Netzwerkanalyse und Netzwerktheorie, Springer**:** 261-272.

Myers, M. D. and M. Newman (2007). "The qualitative interview in IS research: Examining the craft." Information and organization **17**(1): 2-26.

Nadler, D. A. and M. L. Tushman (1989). "Organizational frame bending: Principles for managing reorientation." The Academy of Management Executive **3**(3): 194-204.

Nahapiet, J. (2008). "The Role of Social Capital in Inter-organizational Relationships."

Nahapiet, J. and S. Ghoshal (1997). SOCIAL CAPITAL, INTELLECTUAL CAPITAL AND THE CREATION OF VALUE IN FIRMS. Academy of Management Proceedings, Academy of Management.

Nahapiet, J. and S. Ghoshal (1998). "Social capital, intellectual capital, and the organizational advantage." Academy of management review **23**(2): 242-266.

Nandhakumar, J. and M. Jones (1997). "Too close for comfort? Distance and engagement in interpretive information systems research." Information systems journal **7**(2): 109-131.

Narayan, D. and M. F. Cassidy (2001). "A dimensional approach to measuring social capital: development and validation of a social capital inventory." Current sociology **49**(2): 59-102.

Narteh, B. (2008). "Knowledge transfer in developed-developing country interfirm collaborations: a conceptual framework." Journal of knowledge management **12**(1): 78-91.

Neuman, W. L. (2007). The Basics of Social Research: Qualitative and Quantitative Approaches 2nd ed. Boston, Massachusetts: Pearson Education, Inc.

Newman, M. E. (2003). "The structure and function of complex networks." SIAM review **45**(2): 167-256.

Newton, K. (2001). "Trust, social capital, civil society, and democracy." International Political Science Review **22**(2): 201-214.

Nie, W. and H. Zeng (2003). "The impact of China's WTO accession on its mobile communications market." Journal of Business and Management **9**(2): 151.

Nier, E., J. Yang, T. Yorulmazer and A. Alentorn (2007). "Network models and financial stability." Journal of Economic Dynamics and Control **31**(6): 2033-2060.

Nohria, N. and C. Garcia-Pont (1991). "Global strategic linkages and industry structure." Strategic management journal **12**(S1): 105-124.

Nooteboom, B. (2000). "Institutions and forms of co-ordination in innovation systems." Organization studies **21**(5): 915-939.

Nooteboom, B. (2004). Inter-firm collaboration, learning and networks: an integrated approach, Psychology Press.

Nooteboom, B., H. Berger and N. G. Noorderhaven (1997). "Effects of trust and governance on relational risk." Academy of management Journal **40**(2): 308-338.

Nooteboom, B., W. Van Haverbeke, G. Duysters, V. Gilsing and A. Van den Oord (2007). "Optimal cognitive distance and absorptive capacity." Research policy **36**(7): 1016-1034.

Norman, P. M. (2002). "Protecting knowledge in strategic alliances: Resource and relational characteristics." The Journal of High Technology Management Research **13**(2): 177-202.

Norris, P. (1996). "Does television erode social capital? A reply to Putnam." PS: Political Science & Politics **29**(03): 474-480.

Nunally, J. and I. H. Bernstein (1994). "Psychonometric theory." New York.

Obstfeld, D. (2005). "Social networks, the tertius iungens orientation, and involvement in innovation." Administrative science quarterly **50**(1): 100-130.

OECD (2003). Working party on telecommunication and information services policies. France, OECD.

Oerlemans, L., M. Meeus and F. Boekema (2001). "On the spatial embeddedness of innovation networks: an exploration of the proximity effect." Tijdschrift voor economische en sociale geografie **92**(1): 60-75.

Ogutu, M., P. K. Obonyo and M. G. Munjuri (2015). "Human Capital and Performance of Commercial Banks and Insurance Firms in Kenya."

Ohmae, K. (1989). "The global logic of strategic alliances." Harvard business review **67**(2): 143-154.

Oliver, A. L. and M. Ebers (1998). "Networking network studies: an analysis of conceptual configurations in the study of inter-organizational relationships." Organization studies **19**(4): 549-583.

Oliver, C. (1991). "Strategic responses to institutional processes." Academy of management review **16**(1): 145-179.

Olkkonen, R., H. Tikkanen and K. Alajoutsijärvi (2000). "The role of communication in business relationships and networks." Management Decision **38**(6): 403-409.

Olsen, W. (2004). "Triangulation in social research: qualitative and quantitative methods can really be mixed." Developments in sociology **20**: 103-118.

Ordonez de Pablos, P. (2002). "Evidence of intellectual capital measurement from Asia, Europe and the Middle East." Journal of Intellectual capital **3**(3): 287-302.

Orlikowski, W. J. and J. J. Baroudi (1991). "Studying information technology in organizations: Research approaches and assumptions." Information systems research **2**(1): 1-28.

Orton, J. D. and K. E. Weick (1990). "Loosely coupled systems: A reconceptualization." Academy of management review **15**(2): 203-223.

Ouchi, W. G. (1980). "Markets, bureaucracies, and clans." Administrative science quarterly: 129-141.

Ouchi, W. G. and M. K. Bolton (1988). "The logic of joint research and development." California Management Review **30**(3): 9-33.

Oxley, J. E. (1997). "Appropriability hazards and governance in strategic alliances: A transaction cost approach." Journal of law, Economics, and Organization **13**(2): 387-409.

Paldam, M. (2000). "Social capital: one or many? Definition and measurement." Journal of economic surveys **14**(5): 629-653.

Papaioannou, P., D. Allen, S. Karanasios and N. Thomopoulos (2014). "Theory and practice of using ICT to facilitate smart and green regional development: best practice, evaluation and future challenges for multi-level governance (Workshop)."

Parastatidis, S., E. Viegas and T. Hey (2009). "Viewpoint A smart cyberinfrastructure for research." Communications of the ACM **52**(12): 33-37.

Parasuraman, A., D. Grewal and R. Krishnan (2006). Marketing research, Cengage Learning.

Park, S. H. and Y. Luo (2001). "Guanxi and organizational dynamics: Organizational networking in Chinese firms." Strategic management journal **22**(5): 455-477.

Park, S. H. and G. R. Ungson (1997). "The effect of national culture, organizational complementarity, and economic motivation on joint venture dissolution." Academy of Management journal **40**(2): 279-307.

Park, Y., J. Shin and T. Kim (2010). "Firm size, age, industrial networking, and growth: A case of the Korean manufacturing industry." Small Business Economics **35**(2): 153-168.

Parker, M. (2000). Organizational culture and identity: Unity and division at work, Sage.

Parkhe, A. (1993). "Strategic alliance structuring: A game theoretic and transaction cost examination of interfirm cooperation." Academy of management journal **36**(4): 794-829.

Parkhe, A. (1998). "Understanding trust in international alliances." Journal of world business **33**(3): 219-240.

Parkhe, A., S. Wasserman and D. A. Ralston (2006). "New frontiers in network theory development." Academy of Management Review **31**(3): 560-568.

Paszkiewicz, Z. and W. Picard (2010). MAPSS, a multi-aspect partner and service selection method. Working Conference on Virtual Enterprises, Springer.

Pattison, P. and S. Wasserman (1999). "Logit models and logistic regressions for social networks: II. Multivariate relations." British Journal of Mathematical and Statistical Psychology **52**(2): 169-193.

Pearce, C. L. and M. D. Ensley (2004). "A reciprocal and longitudinal investigation of the innovation process: The central role of shared vision in product and process innovation teams (PPITs)." Journal of Organizational Behavior **25**(2): 259-278.

Peng, M. W. (1997). "Firm growth in transitional economies: Three longitudinal cases from China, 1989-96." Organization Studies **18**(3): 385-413.

Peng, M. W. and P. S. Heath (1996). "The growth of the firm in planned economies in transition: Institutions, organizations, and strategic choice." Academy of management review **21**(2): 492-528.

Peng, M. W. and Y. Luo (2000). "Managerial ties and firm performance in a transition economy: The nature of a micro-macro link." Academy of management journal **43**(3): 486-501.

Pennacchi, G. G. (1988). "Loan sales and the cost of bank capital." The Journal of Finance **43**(2): 375-396.

Pennings, J. M., K. Lee and A. Van Witteloostuijn (1998). "Human capital, social capital, and firm dissolution." Academy of management Journal **41**(4): 425-440.

Peredo, A. M. and J. J. Chrisman (2006). "Toward a theory of community-based enterprise." Academy of Management Review **31**(2): 309-328.

Perkins, D. (1994). "Completing China's move to the market." The Journal of Economic Perspectives **8**(2): 23-46.

Perkmann, M., V. Tartari, M. McKelvey, E. Autio, A. Broström, P. D'Este, R. Fini, A. Geuna, R. Grimaldi and A. Hughes (2013). "Academic engagement and commercialisation: A review of the literature on university–industry relations." Research policy **42**(2): 423-442.

Perrault, E., R. McClelland, C. Austin and J. Sieppert (2011). "Working together in collaborations: Successful process factors for community collaboration." Administration in Social Work **35**(3): 282-298.

Petersen, M. A. and R. G. Rajan (1994). "The benefits of lending relationships: Evidence from small business data." The journal of finance **49**(1): 3-37.

Peterson, N. L. (1991). "Interagency collaboration under part H the key to comprehensive, multidisciplinary, coordinated infant/toddler intervention services." Journal of Early Intervention **15**(1): 89-105.

Petter, S., D. Straub and A. Rai (2007). "Specifying formative constructs in information systems research." Mis Quarterly: 623-656.

Pezzoni, M., V. Sterzi and F. Lissoni (2012). "Career progress in centralized academic systems: Social capital and institutions in France and Italy." Research Policy **41**(4): 704-719.

Phan, P. H., S. H. Lee and S. C. Lau (2003). "The performance impact of interlocking directorates: The case of Singapore." Journal of Managerial Issues: 338-352.

Pierce, J. C. and N. P. Lovrich (2003). "Internet Technology Transfer and Social Capital: Aggregate and Individual Relationships in American Cities." Comparative Technology Transfer and Society **1**(1): 49-71.

Podolny, J. M. (1994). "Market uncertainty and the social character of economic exchange." Administrative science quarterly: 458-483.

Podolny, J. M. and J. N. Baron (1997). "Resources and relationships: Social networks and mobility in the workplace." American sociological review: 673-693.

Podolny, J. M. and T. E. Stuart (1995). "A role-based ecology of technological change." American Journal of Sociology **100**(5): 1224-1260.

Podsakoff, P. M., S. B. MacKenzie, J.-Y. Lee and N. P. Podsakoff (2003). "Common method biases in behavioral research: a critical review of the literature and recommended remedies." Journal of applied psychology **88**(5): 879.

Poppo, L. and T. Zenger (2002). "Do formal contracts and relational governance function as substitutes or complements?" Strategic management journal **23**(8): 707-725.

Porta, S., P. Crucitti and V. Latora (2006). "The network analysis of urban streets: a primal approach." Environment and Planning B: planning and design **33**(5): 705-725.

Porter, M. E. (1990). "The competitive advantage of nations." Harvard business review **68**(2): 73-93.

Portes, A. (1998). "Social capital: Its origins and applications in modern sociology." Annual review of sociology **24**(1): 1-24.

Portes, A. (2000). The two meanings of social capital. Sociological forum, Springer.

Powell, G. N. (1990). "One more time: Do female and male managers differ?" The Executive **4**(3): 68-75.

Powell, L. and B. Burke (1990). "Internuclear exchange of an inner nuclear membrane protein (p55) in heterokaryons: in vivo evidence for the interaction of p55 with the nuclear lamina." The Journal of Cell Biology **111**(6): 2225-2234.

Powell, W. W. and P. Brantley (1992). "Competitive cooperation in biotechnology: Learning through networks." Networks and organizations **7**: 366-394.

Powell, W. W., K. W. Koput and L. Smith-Doerr (1996). "Interorganizational collaboration and the locus of innovation: Networks of learning in biotechnology." Administrative science quarterly: 116-145.

Prestov, I. (2009). Dynamic Network Analysis for Understanding Complex Systems and Processes, Defence Research and Development Canada.

Prevezer, M. (2001). "Ingredients in the early development of the US biotechnology industry." Small Business Economics **17**(1): 17-29.

Provan, K. G., A. Fish and J. Sydow (2007). "Interorganizational networks at the network level: A review of the empirical literature on whole networks." Journal of management **33**(3): 479-516.

Punch, K. (1998). Introduction to social research: Quantitative and qualitative methods, London: Sage.

Punnett, B. J. and P. Yu (1990). "Attitudes toward doing business with the PRC: A comparison of Canadian and US companies." International Studies of Management & Organization **20**(1-2): 149-160.

Putnam, R. D. (1993). "The prosperous community: social capital and public life." The american prospect(13).

Putnam, R. D. (1995). "Bowling alone: America's declining social capital." Journal of democracy **6**(1): 65-78.

Putnam, R. D. (2000). Bowling alone: America's declining social capital. Culture and politics, Springer**:** 223-234.

Pye, L. W. (1995). "Factions and the politics of guanxi: paradoxes in Chinese administrative and political behaviour." The China Journal(34): 35-53.

Raub, W., V. Buskens and V. Frey (2013). "The rationality of social structure: Cooperation in social dilemmas through investments in and returns on social capital." Social Networks **35**(4): 720-732.

Reagans, R. and B. McEvily (2003). "Network structure and knowledge transfer: The effects of cohesion and range." Administrative science quarterly **48**(2): 240-267.

Reed, K. K., M. Lubatkin and N. Srinivasan (2006). "Proposing and testing an intellectual capital-based view of the firm." Journal of management studies **43**(4): 867-893.

Reich, B. H. and M. L. Kaarst-Brown (2003). "Creating social and intellectual capital through IT career transitions." The Journal of Strategic Information Systems **12**(2): 91-109.

Reinartz, W., M. Haenlein and J. Henseler (2009). "An empirical comparison of the efficacy of covariance-based and variance-based SEM." International Journal of research in Marketing **26**(4): 332-344.

Reuer, J. J. (1999). "Collaborative strategy: The logic of alliances." Mastering strategy **4**: 12-13.

Rheingold, H. (2001). "Mobile virtual communities." The feature **9**.

Richards, M. and Y. Yang (2007). "Determinants of foreign ownership in international R&D joint ventures: Transaction costs and national culture." Journal of International Management **13**(2): 110-130.

Riemer, K. (2004). "The Role of Social Capital in Managing Relationships with IT suppliers-a Case Studt in Electronic Commerce."

Riemer, K. and S. Klein (2004). "How can virtual organizations deliver? Promises, challenges and potential remedies." E-Learning: Modelle, Instrumente und Erfahrungen-Software Produktlinien-Communities in E-Business: 275-291.

Ring, P. S. and A. H. Van de Ven (1994). "Developmental processes of cooperative interorganizational relationships." Academy of management review **19**(1): 90-118.

Ringle, C., S. Wende and A. Will (2005). "Smart-PLS Version 2.0 M3." University of Hamburg.

Ringle, C. M., M. Sarstedt and D. Straub (2012). "A critical look at the use of PLS-SEM in MIS Quarterly." MIS Quarterly (MISQ) **36**(1).

Robbie, K., M. Wright and B. Chiplin (1997). "The monitoring of venture capital firms." Entrepreneurship: Theory and Practice **21**(4): 9-29.

Roden, S. and B. Lawson (2014). "Developing social capital in buyer–supplier relationships: The contingent effect of relationship-specific adaptations." International Journal of Production Economics **151**: 89-99.

Rogers, E. M. (2003). "Elements of diffusion." Diffusion of innovations **5**: 1-38.

Rogers, E. M. and D. L. Kincaid (1981). "Communication networks: toward a new paradigm for research."

Rogers, E. M. and J. K. Larsen (1984). Silicon Valley fever: Growth of high-technology culture, Basic books New York.

Romo, F. P. and M. Schwartz (1995). "The structural embeddedness of business decisions: The migration of manufacturing plants in New York State, 1960 to 1985." American sociological review: 874-907.

Roth, H. (1998). Sri Lanka, past and present: Archaeology, Geography, Economics: selected papers on German research, Margraf Verlag.

Rothaermel, F. T. (2001). "Incumbent's advantage through exploiting complementary assets via interfirm cooperation." Strategic Management Journal **22**(6-7): 687-699.

Rothenberg, R. B., J. J. Potterat, D. E. Woodhouse, W. W. Darrow, S. Q. Muth and A. S. Klovdahl (1995). "Choosing a centrality measure: epidemiologic correlates in the Colorado Springs study of social networks." Social Networks **17**(3-4): 273-297.

Rottman, J. W. (2008). "Successful knowledge transfer within offshore supplier networks: a case study exploring social capital in strategic alliances." Journal of Information Technology **23**(1): 31-43.

Rowley, T., D. Behrens and D. Krackhardt (2000). "Redundant governance structures: An analysis of structural and relational embeddedness in the steel and semiconductor industries." Strategic management journal: 369-386.

Ruekert, R. W. and O. C. Walker Jr (1987). "Marketing's interaction with other functional units: A conceptual framework and empirical evidence." The Journal of Marketing: 1-19.

Ruf, B. M., K. Muralidhar, R. M. Brown, J. J. Janney and K. Paul (2001). "An empirical investigation of the relationship between change in corporate social performance and financial performance: A stakeholder theory perspective." Journal of business ethics **32**(2): 143-156.

Russo, M. V. and P. A. Fouts (1997). "A resource-based perspective on corporate environmental performance and profitability." Academy of management Journal **40**(3): 534-559.

Rutten, R., H. Westlund and F. Boekema (2010). "The spatial dimension of social capital." European Planning Studies **18**(6): 863-871.

Sacconi, L. (2004). "Corporate Social Responsibility (CSR) as a Model of'Extended'Corporate Governance: An Explanation Based on the Economic Theories of Social Contract, Reputation and Reciprocal Conformism."

Sacconi, L. (2006). "A social contract account for CSR as an extended model of corporate governance (I): Rational bargaining and justification." Journal of Business Ethics **68**(3): 259-281.

Sacconi, L. (2007). "A social contract account for CSR as an extended model of corporate governance (II): Compliance, reputation and reciprocity." Journal of business ethics **75**(1): 77-96.

Sacconi, L. and G. Degli Antoni (2008). "A theoretical analysis of the relationship between social capital and corporate social responsibility: concepts and definitions."

Saeed, M. M. and F. Arshad (2012). "Corporate social responsibility as a source of competitive advantage: The mediating role of social capital and reputational capital." Journal of Database Marketing & Customer Strategy Management **19**(4): 219-232.

Sailer, K. and I. McCulloh (2012). "Social networks and spatial configuration—How office layouts drive social interaction." Social networks **34**(1): 47-58.

Sanchez, R. (1995). "Strategic flexibility in product competition." Strategic management journal **16**(S1): 135-159.

Sanchez, R. and J. T. Mahoney (1996). "Modularity, flexibility, and knowledge management in product and organization design." Strategic management journal **17**(S2): 63-76.

Sandefur, R. L. and E. O. Laumann (1998). "A paradigm for social capital." Rationality and society **10**(4): 481-501.

Sarstedt, M., J. Henseler and C. M. Ringle (2011). Multigroup analysis in partial least squares (PLS) path modeling: Alternative methods and empirical results. Measurement and research methods in international marketing, Emerald Group Publishing Limited**:** 195-218.

Sauer, P. L. and A. Dick (1993). "Using moderator variables in structural equation models." NA-Advances in Consumer Research Volume 20.

Saxenian, A. (1994). "Regional networks: industrial adaptation in Silicon Valley and route 128."

Saxton, T. (1997). "The effects of partner and relationship characteristics on alliance outcomes." Academy of management journal **40**(2): 443-461.

Schein, E. H. (1990). Organizational culture, American Psychological Association.

Schilling, M. A. (2000). "Toward a general modular systems theory and its application to interfirm product modularity." Academy of management review **25**(2): 312-334.

Schilling, M. A. and C. C. Phelps (2007). "Interfirm collaboration networks: The impact of large-scale network structure on firm innovation." Management Science **53**(7): 1113-1126.

Schilling, M. A. and H. K. Steensma (2001). "The use of modular organizational forms: An industry-level analysis." Academy of Management Journal **44**(6): 1149-1168.

Schuster, T. and P. Weiß (2010). A new approach to competence-based business partner profiles for collaborative business process management. Working Conference on Virtual Enterprises, Springer.

Sciascia, S. and P. Mazzola (2008). "Family involvement in ownership and management: Exploring nonlinear effects on performance." Family Business Review **21**(4): 331-345.

Sekaran, U. (2003). Research methods for business . Hoboken, NJ: John Wiley & Sons.

Selwyn, N. (2004). "The information aged: A qualitative study of older adults' use of information and communications technology." Journal of Aging studies **18**(4): 369-384.

Sen, S. and C. B. Bhattacharya (2001). "Does doing good always lead to doing better? Consumer reactions to corporate social responsibility." Journal of marketing Research **38**(2): 225-243.

Sen, S., C. B. Bhattacharya and D. Korschun (2006). "The role of corporate social responsibility in strengthening multiple stakeholder relationships: A field experiment." Journal of the Academy of Marketing science **34**(2): 158-166.

Seppänen, R., K. Blomqvist and S. Sundqvist (2007). "Measuring inter-organizational trust—a critical review of the empirical research in 1990–2003." Industrial Marketing Management **36**(2): 249-265.

Shah, D. V., J. Cho, W. P. Eveland and N. Kwak (2005). "Information and expression in a digital age modeling Internet effects on civic participation." Communication research **32**(5): 531-565.

Shan, W. and W. Hamilton (1991). "Country—Specific advantage and international cooperation." Strategic Management Journal **12**(6): 419-432.

Shane, S. and D. Somaya (2007). "The effects of patent litigation on university licensing efforts." Journal of Economic Behavior & Organization **63**(4): 739-755.

Sheldon, G. and M. Maurer (1998). "Interbank lending and systemic risk: An empirical analysis for switzerland." REVUE SUISSE D ECONOMIE POLITIQUE ET DE STATISTIQUE **134**: 685-704.

Shim, D. C. and T. H. Eom (2009). "Anticorruption effects of information communication and technology (ICT) and social capital." International review of administrative sciences **75**(1): 99-116.

Simmel, G. (1907). "1978. The Philosophy of Money." Trans. by BOTTOMORE, T. and FRISBY, D.(Routledge and Kegan Paul, Boston).

Simoes, C. and S. Dibb (2008). "Illustrations of the internal management of corporate identity." Facets of Corporate Identity, Communication, and Reputation, Routledge, London: 66-80.

Simons, K. (1993). "Why do banks syndicate loans?" New England Economic Review(Jan): 45-52.

Singh, J. V., D. J. Tucker and R. J. House (1986). "Organizational legitimacy and the liability of newness." Administrative science quarterly: 171-193.

Singh, K. and W. Mitchell (2005). "Growth dynamics: the bidirectional relationship between interfirm collaboration and business sales in entrant and incumbent alliances." Strategic Management Journal **26**(6): 497-521.

Sitkin, S. B. and N. L. Roth (1993). "Explaining the limited effectiveness of legalistic "remedies" for trust/distrust." Organization science **4**(3): 367-392.

Sivo, S. A., C. Saunders, Q. Chang and J. J. Jiang (2006). "How low should you go? Low response rates and the validity of inference in IS questionnaire research." Journal of the Association for Information Systems **7**(6): 17.

Six, F., B. Nooteboom and A. Hoogendoorn (2010). "Actions that build interpersonal trust: A relational signalling perspective." Review of Social Economy **68**(3): 285-315.

Smith-Doerr, L. and W. W. Powell (2010). "17 Networks and Economic Life." The handbook of economic sociology: 379.

Smith, J. B. (1997). "Selling alliances: Issues and insights." Industrial Marketing Management **26**(2): 149-161.

Smith, P. A., V. Allee and J. Taug (2006). "Collaboration, innovation, and value creation in a global telecom." The Learning Organization **13**(6): 569-578.

Snijders, T. A. (2001). "The statistical evaluation of social network dynamics." Sociological methodology **31**(1): 361-395.

Soramäki, K., M. L. Bech, J. Arnold, R. J. Glass and W. E. Beyeler (2007). "The topology of interbank payment flows." Physica A: Statistical Mechanics and its Applications **379**(1): 317-333.

Spekman, R. E. (1996). "A reflection on two decades of business-to-business marketing research." Networks in marketing: 8-15.

Spekman, R. E. (2000). "Alliance competence: Maximizing the value of your partnership."

Spellerberg, A. (2001). Framework for the measurement of social capital in New Zealand, Statistics New Zealand Wellington.

Spence, L. J. and R. Schmidpeter (2003). "SMEs, social capital and the common good." Journal of Business Ethics **45**(1-2): 93-108.

Sriram, V. and S. Banerjee (1994). "Electronic data interchange: does its adoption change purchasing policies and procedures?" International Journal of Purchasing and Materials Management **30**(4): 30-40.

Srivastava, A. and S. B. Thomson (2009). "Framework analysis: a qualitative methodology for applied policy research."

Srivastava, L. (2005). "Mobile phones and the evolution of social behaviour." Behaviour & Information Technology **24**(2): 111-129.

Stallkamp, T. T. (2005). SCORE!: A Better Way to Do Busine $ $: Moving from Conflict to Collaboration, Pearson Education.

Starkey, K., C. Barnatt and S. Tempest (2000). "Beyond networks and hierarchies: Latent organizations in the UK television industry." Organization Science **11**(3): 299-305.

Steckler, A., K. R. McLeroy, R. M. Goodman, S. T. Bird and L. McCormick (1992). Toward integrating qualitative and quantitative methods: an introduction, Sage Publications Sage CA: Thousand Oaks, CA.

Steinfield, C. (2004). "Explaining the underutilization of business-to-business e-commerce in geographically defined business clusters: The role of social capital." Social Capital and IT. Cambridge, MA: MIT Press: 209-229.

Sternberg, R. (1999). "Innovative linkages and proximity: empirical results from recent surveys of small and medium sized firms in German regions." Regional Studies **33**(6): 529-540.

Stone, D. N. (1990). "Assumptions and values in the practice of information systems evaluation." Journal of Information Systems **4**(2): 1-17.

Stone, M. (1974). "Cross-validatory choice and assessment of statistical predictions." Journal of the Royal Statistical Society. Series B (Methodological): 111-147.

Stone, W. (2001). "Measuring social capital." Australian Institute of Family Studies, Research Paper **24**.

Stone, W. and J. Hughes (2002). Measuring Social capital: Toward a standardised approach. Paper presented at the, Citeseer.

Strasser, S., J. Eveland, G. Cummins, O. L. Deniston and J. H. Romani (1981). "Conceptualizing the goal and system models of organizational effectiveness—implications for comparative evaluation research." Journal of Management Studies **18**(3): 321-340.

Straub, D., M.-C. Boudreau and D. Gefen (2004). "Validation guidelines for IS positivist research." The Communications of the Association for Information Systems **13**(1): 63.

Strub, P. J. and T. Priest (1976). "Two patterns of establishing trust: The marijuana user." Sociological Focus **9**(4): 399-411.

Stuart, T. E. (2000). "Interorganizational alliances and the performance of firms: A study of growth and innovation rates in a high-technology industry." Strategic management journal: 791-811.

Stuart, T. E., H. Hoang and R. C. Hybels (1999). "Interorganizational endorsements and the performance of entrepreneurial ventures." Administrative science quarterly **44**(2): 315-349.

Stump, R. L. and V. Sriram (1997). "Employing information technology in purchasing: buyer-supplier relationships and size of the supplier base." Industrial Marketing Management **26**(2): 127-136.

Sturgeon, T. J. (2002). "Modular production networks: a new American model of industrial organization." Industrial and corporate change **11**(3): 451-496.

Su, C., Z. Yang, G. Zhuang, N. Zhou and W. Dou (2009). "Interpersonal influence as an alternative channel communication behavior in emerging markets: The case of China." Journal of International Business Studies **40**(4): 668-689.

Subramani, M. (2004). "How do suppliers benefit from information technology use in supply chain relationships?" Mis Quarterly: 45-73.

Subramanian, A. M., K. Lim and P.-h. Soh (2016). "Bridging Scientists and Informal R&D Collaborations." Managing Knowledge Integration Across Boundaries: 191.

Subramanian, S. V., D. J. Kim and I. Kawachi (2002). "Social trust and self-rated health in US communities: a multilevel analysis." Journal of Urban Health **79**: S21-S34.

Susskind, A. M., P. R. Odom-Reed and A. E. Viccari (2011). "Team leaders and team members in interorganizational networks: an examination of structural holes and performance." Communication Research **38**(5): 613-633.

Sydow, J. and A. Windeler (1998). "Organizing and evaluating interfirm networks: A structurationist perspective on network processes and effectiveness." Organization science **9**(3): 265-284.

Syrjanen, A. and K. Kuutti (2004). Trust, acceptance and alignment: the role of IT in Redirecting a community. IT and social capital. M. a. W. Huysman, V. Cambridge, MA: MIT Press.

Tabachnick, B. and L. Fidell (2007). "Multivariate analysis of variance and covariance." Using multivariate statistics **3**: 402-407.

Tabachnick, B. and L. Fidell (2007). "Using Multivariate Statistics. Pearson Education." Boston, MA.

Tan-Torres Edejer, T., A. Acharya, T. Adam, R. Baltussen, D. B. Evans, R. Hutubessy, C. J. L. Murray, H. C. Correa, S. Torrecilla and M. AngelBROMWICH (2003). Making choices in health: WHO guide to cost-effectiveness analysis, Organización Panamericana de la Salud.

Tashiro, J. (2002). "Exploring health promoting lifestyle behaviors of Japanese college women: perceptions, practices, and issues." Health care for women international **23**(1): 59-70.

Tenenhaus, M., S. Amato and V. Esposito Vinzi (2004). A global goodness-of-fit index for PLS structural equation modelling. Proceedings of the XLII SIS scientific meeting.

Ter Wal, A. L. and R. A. Boschma (2009). "Applying social network analysis in economic geography: framing some key analytic issues." The Annals of Regional Science **43**(3): 739-756.

Thomson, A. M., J. L. Perry and T. K. Miller (2009). "Conceptualizing and measuring collaboration." Journal of Public Administration Research and Theory **19**(1): 23-56.

Thune, T. and M. Gulbrandsen (2014). "Dynamics of collaboration in university–industry partnerships: do initial conditions explain development patterns?" The Journal of Technology Transfer **39**(6): 977-993.

Thurmaier, K. and C. Wood (2002). "Interlocal agreements as overlapping social networks: Picket–fence regionalism in metropolitan Kansas City." Public Administration Review **62**(5): 585-598.

Todeva, E. (2007). "Strategic Alliances."

Tokoro, N. (2007). "Stakeholders and corporate social responsibility (CSR): a new perspective on the structure of relationships." Asian Business & Management **6**(2): 143-162.

Torre, A. and A. Rallet (2005). "Proximity and localization." Regional studies **39**(1): 47-59.

Trauth, E. M. and L. M. Jessup (2000). "Understanding computer-mediated discussions: positivist and interpretive analyses of group support system use." MIs Quarterly: 43-79.

Tsai, W. (2000). "Social capital, strategic relatedness and the formation of intraorganizational linkages." Strategic management journal **21**(9): 925-939.

Tsai, W. and S. Ghoshal (1998). "Social Capital and Value Creation: The Role of Intrafirm Networks." Academy of Management Journal **41**(4): 464-476.

Tsai, Y.-H., H.-C. Ma, C.-P. Lin, C.-K. Chiu and S.-C. Chen (2014). "Group social capital in virtual teaming contexts: A moderating role of positive affective tone in knowledge sharing." Technological Forecasting and Social Change **86**: 13-20.

Tsang, E. W. (2002). "Sharing international joint venturing experience: A study of some key determinants." MIR: Management International Review: 183-205.

Tully, S. (1996). "Northwest and KLM: The alliance from hell." Fortune **24**: 46-48.

Tura, T. and V. Harmaakorpi (2005). "Social capital in building regional innovative capability." Regional Studies **39**(8): 1111-1125.

Turban, D. B. and D. W. Greening (1997). "Corporate social performance and organizational attractiveness to prospective employees." Academy of management journal **40**(3): 658-672.

UNCTAD (2005). INFORMATION ECONOMY REPORT 2005. New York and Geneva, UNITED NATIONS.

Uphoff, N. and C. M. Wijayaratna (2000). "Demonstrated benefits from social capital: the productivity of farmer organizations in Gal Oya, Sri Lanka." World Development **28**(11): 1875-1890.

Upper, C. and A. Worms (2004). "Estimating bilateral exposures in the German interbank market: Is there a danger of contagion?" European Economic Review **48**(4): 827-849.

Urbach, N. and F. Ahlemann (2010). "Structural equation modeling in information systems research using partial least squares." JITTA: Journal of Information Technology Theory and Application **11**(2): 5.

Urquhart, C., H. Lehmann and M. D. Myers (2010). "Putting the 'theory'back into grounded theory: guidelines for grounded theory studies in information systems." Information systems journal **20**(4): 357-381.

Uzzi, B. (1996). "The sources and consequences of embeddedness for the economic performance of organizations: The network effect." American sociological review: 674-698.

Uzzi, B. (1997). "Social structure and competition in interfirm networks: The paradox of embeddedness." Administrative science quarterly: 35-67.

Uzzi, B. (1999). "Embeddedness in the making of financial capital: How social relations and networks benefit firms seeking financing." American sociological review: 481-505.

Uzzi, B., R. Guimera, J. Spiro and L. Amaral (2006). Emergence: The dynamics of network formation. annual meeting of the American Sociological Association, Montreal, Quebec, Canada.

Uzzi, B. and J. Spiro (2005). "Collaboration and creativity: The small world problem 1." American journal of sociology **111**(2): 447-504.

V. Shah, N. K., R. Lance Holbert, Dhavan (2001). "" Connecting" and" disconnecting" with civic life: Patterns of Internet use and the production of social capital." Political communication **18**(2): 141-162.

Valente, T. W., K. Coronges, C. Lakon and E. Costenbader (2008). "How correlated are network centrality measures?" Connections (Toronto, Ont.) **28**(1): 16.

Valente, T. W. and R. K. Foreman (1998). "Integration and radiality: measuring the extent of an individual's connectedness and reachability in a network." Social networks **20**(1): 89-105.

Valkokari, K. and P. Rana (2017). Towards Sustainability Governance in Value Networks. Value Networks in Manufacturing, Springer**:** 43-63.

Van Der Gaag, M. and T. A. Snijders (2005). "The Resource Generator: social capital quantification with concrete items." Social networks **27**(1): 1-29.

Van der Gaag, M., T. A. Snijders and H. D. Flap (2008). "Position Generator measures and their relationship to other Social Capital measures." Social capital: An international research program: 27-49.

Van der Gaag, M. and M. Webber (2008). Measurement of individual social capital. Social capital and health, Springer**:** 29-49.

Van der Gaag, M. P. and T. A. Snijders (2004). "Proposals for the measurement of individual social capital." Creation and returns of social capital: 199-218.

Van der Krogt, D., J. Nilsson and V. Host (2007). "The impact of cooperatives' risk aversion and equity capital constraints on their inter-firm consolidation and collaboration strategies-with an empirical study of the European dairy industry." Agribusiness **23**(4): 453.

Van der Stede, W. A., S. M. Young and C. X. Chen (2005). "Assessing the quality of evidence in empirical management accounting research: The case of survey studies." Accounting, organizations and society **30**(7): 655-684.

van Liere, D. (2007). Network horizon and the dynamics of network positions: A multi-method multi-level longitudinal study of interfirm networks, Erasmus Research Institute of Management (ERIM).

Van Liere, D., L. Hagdorn, M. Hoogeweegen and P. Vervest (2004). "The business networking game—an experimental research tool for analysing modular business network structures." Hofstede, GJ.

Van Liere, D., M. Hoogeweegen, P. Vervest and L. Hagdorn (2006). "To adopt or not to adopt? Experiencing the effect of quick connect capabilities on network performance." Production Planning & Control **17**(6): 596-603.

Van Maanen, J. (1979). "The fact of fiction in organizational ethnography." Administrative science quarterly: 539-550.

Vance, S. C. (1975). "Are socially responsible corporations good investment risks." Management review **64**(8): 19-24.

Vangen, S. and C. Huxham (2010). Introducing the theory of collaborative advantage, Routledge.

Veenstra, G. (2002). "Explicating social capital: Trust and participation in the civil space." Canadian Journal of Sociology/Cahiers canadiens de sociologie: 547-572.

Venaik, S., D. F. Midgley and T. M. Devinney (2005). "Dual paths to performance: The impact of global pressures on MNC subsidiary conduct and performance." Journal of International Business Studies **36**(6): 655-675.

Venkatesh, V. and F. D. Davis (2000). "A theoretical extension of the technology acceptance model: Four longitudinal field studies." Management science **46**(2): 186-204.

Venkatesh, V., M. G. Morris, G. B. Davis and F. D. Davis (2003). "User acceptance of information technology: Toward a unified view." MIS quarterly: 425-478.

Venkatraman, N. and C.-H. Lee (2004). "Preferential linkage and network evolution: A conceptual model and empirical test in the US video game sector." Academy of Management Journal **47**(6): 876-892.

Venkatraman, N. and V. Ramanujam (1986). "Measurement of business performance in strategy research: A comparison of approaches." Academy of management review **11**(4): 801-814.

Vervest, P., K. Preiss, E. Van Heck and L.-F. Pau (2004). "The emergence of smart business networks." Journal of Information Technology **19**(4): 228-233.

Vervest, P., E. Van Heck, K. Preiss and L. Pau (2004). "Introduction to smart business networks." Journal of Information Technology **19**(4): 225-227.

Vijayasarathy, L. R. and D. Robey (1997). "The effect of EDI on market channel relationships in retailing." Information & Management **33**(2): 73-86.

Vilana, J. R. and C. R. Monroy (2010). "Influence of cultural mechanisms on horizontal inter-firm collaborations." Journal of Industrial Engineering and Management **3**(1): 138-175.

Vinzi, V. E., W. W. Chin, J. Henseler and H. Wang (2010). Handbook of partial least squares: Concepts, methods and applications, Springer Science & Business Media.

Vissers, G. and B. Dankbaar (2016). "Spatial aspects of interfirm collaboration: an exploration of firm-level knowledge dynamics." Regional Studies **50**(2): 260-273.

Vogt, W. P. (2007). Quantitative research methods for professionals, Allyn & Bacon.

Von Hippel, E. (1987). "Cooperation between rivals: Informal know-how trading." Research policy **16**(6): 291-302.

Walker, G., B. Kogut and W. Shan (1997). "Social capital, structural holes and the formation of an industry network." Organization science **8**(2): 109-125.

Walsham, G. (1995). "Interpretive case studies in IS research: nature and method." European Journal of information systems **4**(2): 74.

Wang, F., A. Antipova and S. Porta (2011). "Street centrality and land use intensity in Baton Rouge, Louisiana." Journal of Transport Geography **19**(2): 285-293.

Warde, A., G. Tampubolon, B. Longhurst, K. Ray, M. Savage and M. Tomlinson (2003). "Trends in social capital: Membership of associations in Great Britain, 1991–98." British Journal of Political Science **33**(03): 515-525.

Warmerdam, L., H. Riper, M. Klein, P. van den Ven, A. Rocha, M. Ricardo Henriques, E. Tousset, H. Silva, G. Andersson and P. Cuijpers (2012). "Innovative ICT solutions to improve treatment outcomes for depression: the ICT4Depression project." Stud Health Technol Inform **181**: 339-343.

Wasserman, S. (1994). Social network analysis: Methods and applications, Cambridge university press.

Wasserman, S. and K. Faust (1994). Social network analysis: Methods and applications, Cambridge university press.

Watts, D. J. (1999). Small worlds: the dynamics of networks between order and randomness, Princeton university press.

Watts, D. J. and S. H. Strogatz (1998). "Collective dynamics of 'small-world'networks." nature **393**(6684): 440-442.

Watts, H., A. Wood and P. Wardle (2003). "'Making Friends or Making Things?': Interfirm Transactions in the Sheffield Metal-working Cluster." Urban Studies **40**(3): 615-630.

Weber, C. and B. Weber (2010). "Social Capital and Knowledge Relatedness as Promoters of Organizational Performance: An Explorative Study of Corporate Venture Capital Activity." International Studies of Management & Organization **40**(3): 23-49.

Weber, W., M. Festing and P. J. Dowling (2013). Management and International Review: Cross-Cultural and Comparative International Human Resource Management, Springer Science & Business Media.

Webster, J. and R. T. Watson (2002). "Analyzing the past to prepare for the future: Writing a literature review." MIS quarterly: xiii-xxiii.

Weiß, P. and S. Klink (2007). Collaborative services to maintain electronic business relationships. Working Conference on Virtual Enterprises, Springer.

Wellman, B. and S. D. Berkowitz (1988). Social structures: A network approach, CUP Archive.

Wellman, B., A. Q. Haase, J. Witte and K. Hampton (2001). "Does the Internet increase, decrease, or supplement social capital? Social networks, participation, and community commitment." American behavioral scientist **45**(3): 436-455.

Wells, S. J. (2004). "Financial interlinkages in the United Kingdom's interbank market and the risk of contagion."

Wen, W. (2010). "Ownership Structure and Banking Performance: New Evidence in China." Universitat Autònoma de Barcelona Departament D'economia de L'empresa **24**.

Wernerfelt, B. (1995). "The resource-based view of the firm: Ten years after." Strategic management journal **16**(3): 171-174.

Werts, C. E., R. L. Linn and K. G. Jöreskog (1974). "Intraclass reliability estimates: Testing structural assumptions." Educational and Psychological measurement **34**(1): 25-33.

Weterings, A. and R. Boschma (2006). "The impact of geography on the innovative productivity of software firms in the Netherlands." Regional Development in the Knowledge Economy. Routledge, London and New York: 63-83.

Whetten, D. A. (1981). "Interorganizational relations: A review of the field." The Journal of Higher Education **52**(1): 1-28.

Whitford, J. and J. Zeitlin (2004). "Governing decentralized production: institutions, public policy, and the prospects for inter-firm collaboration in US manufacturing." Industry and Innovation **11**(1-2): 11-44.

Wijesinghe, K. and S. Senaratne (2011). "Impact of disclosure of corporate social responsibility on corporate financial performance in bank, finance and insurance sector in Sri Lanka."

Williamson, A. (2004). Getting ready for eDemocracy: A five-stage maturity model for Community ICT. The Australian Electronic Conference, Citeseer.

Williamson, O. E. (1991). "Comparative economic organization: The analysis of discrete structural alternatives." Administrative science quarterly: 269-296.

Williamson, O. E. (1993). "Calculativeness, trust, and economic organization." The Journal of Law and Economics **36**(1, Part 2): 453-486.

Williamson, O. E. (2005). "The economics of governance." The American Economic Review **95**(2): 1-18.

Wilson, L. (2006). "Developing a model for the measurement of social inclusion and social capital in regional Australia." Social Indicators Research **75**(3): 335-360.

Withered, J. L. (1980). "Reciprocity, Monopsony Power, and Section 7." Antitrust Bull. **25**: 217.

Witt, P. (2004). "Entrepreneurs' networks and the success of start-ups." Entrepreneurship & Regional Development **16**(5): 391-412.

Wong, K. K.-K. (2013). "Partial least squares structural equation modeling (PLS-SEM) techniques using SmartPLS." Marketing Bulletin **24**(1): 1-32.

Wong, P. L.-K. and P. Ellis (2002). "Social ties and partner identification in Sino-Hong Kong international joint ventures." Journal of International Business Studies **33**(2): 267-289.

Wong, W. and E. Welch (2004). "Does e-government promote accountability? A comparative analysis of website openness and government accountability." Governance **17**(2): 275-297.

Woolcock, M. (2001). "The place of social capital in understanding social and economic outcomes." Canadian journal of policy research **2**(1): 11-17.

Woolcock, M. (2002). "Social capital in theory and practice: where do we stand." Social capital and economic development: Well-being in developing countries: 18-39.

Woolcock, M. and D. Narayan (2000). "Social capital: Implications for development theory, research, and policy." The world bank research observer **15**(2): 225-249.

Woolcock, M. and D. Narayan (2006). "Social capital: Implications for development theory, research, and policy revisited." The search for empowerment: Social capital as idea and practice at the World Bank: 31-62.

Woolthuis, R. K., B. Nooteboom and G. De Jong (2010). "Roles of third parties in trust repair: an empirical test in high tech alliances." Free University Amsterdam, Strategic Alliances.

Wright, M. and A. Lockett (2003). "The structure and management of alliances: syndication in the venture capital industry." Journal of Management Studies **40**(8): 2073-2102.

Wu, J. and X. Chen (2012). "Leaders' social ties, knowledge acquisition capability and firm competitive advantage." Asia Pacific Journal of Management **29**(2): 331-350.

Wu, W. p. (2008). "Dimensions of social capital and firm competitiveness improvement: The mediating role of information sharing." Journal of management studies **45**(1): 122-146.

Xin, K. K. and J. L. Pearce (1996). "Guanxi: Connections as substitutes for formal institutional support." Academy of management journal **39**(6): 1641-1658.

Yang, K. and S.-Y. Rho (2007). "E-government for better performance: Promises, realities, and challenges." International Journal of Public Administration **30**(11): 1197-1217.

Yang, S., H. Lee and S. Kurnia (2007). Understanding the relationship between information and communication technology (ICT) and social capital: A conceptual framework. Proceedings of the 13th Asia Pacific Management Conference. Melbourne, Australia.

Yang, S., H. Lee and S. Kurnia (2009). "Social capital in information and communications technology research: past, present, and future." Communications of the Association for Information Systems **25**(1): 23.

Yeshmin, F. (2012). "Visualization of corporate social responsibility information of commercial bank in Bangladesh." World **2**(5).

Yeung, I. Y. and R. L. Tung (1996). "Achieving business success in Confucian societies: The importance of guanxi (connections)." Organizational Dynamics **25**(2): 54-65.

Yip, W., S. Subramanian, A. D. Mitchell, D. T. Lee, J. Wang and I. Kawachi (2007). "Does social capital enhance health and well-being? Evidence from rural China." Social science & medicine **64**(1): 35-49.

Yli-Renko, H., E. Autio and H. J. Sapienza (2001). "Social capital, knowledge acquisition, and knowledge exploitation in young technology-based firms." Strategic management journal **22**(6-7): 587-613.

Young-Ybarra, C. and M. Wiersema (1999). "Strategic flexibility in information technology alliances: The influence of transaction cost economics and social exchange theory." Organization science **10**(4): 439-459.

Zacharia, Z. G., N. W. Nix and R. F. Lusch (2011). "Capabilities that enhance outcomes of an episodic supply chain collaboration." Journal of Operations Management **29**(6): 591-603.

Zaheer, A. and G. G. Bell (2005). "Benefiting from network position: firm capabilities, structural holes, and performance." Strategic management journal **26**(9): 809-825.

Zaheer, A., B. McEvily and V. Perrone (1998). "Does trust matter? Exploring the effects of interorganizational and interpersonal trust on performance." Organization science **9**(2): 141-159.

Zaheer, A. and G. Soda (2009). "Network evolution: The origins of structural holes." Administrative Science Quarterly **54**(1): 1-31.

Zaheer, S. and A. Zaheer (2006). "Trust across borders." Journal of International Business Studies **37**(1): 21-29.

Zeller, M. (2003). Models of rural financial institutions. Paving the Way Forward Conference. June.

Zhang, A. (2014). Collaboration in the Australian and Chinese mobile telecommunication markets, Springer.

Zhang, J., C. Baden-Fuller and V. Mangematin (2007). "Technological knowledge base, R&D organization structure and alliance formation: Evidence from the biopharmaceutical industry." Research policy **36**(4): 515-528.

Zhao, Y. (2002). "Measuring the social capital of laid-off Chinese workers." Current Sociology **50**(4): 555-571.

Zhao, Y. and M. Lavin (2012). "An empirical study of knowledge transfer in working relationships with suppliers in new product development." International Journal of Innovation Management **16**(02): 1250013.

Zheng, W. (2010). "A social capital perspective of innovation from individuals to nations: where is empirical literature directing us?" International Journal of Management Reviews **12**(2): 151-183.

Zikmund, W. (2000). "G.(2000)." Business research methods **6**.

Zollo, M., J. J. Reuer and H. Singh (2002). "Interorganizational routines and performance in strategic alliances." Organization Science **13**(6): 701-713.

Zollo, M. and S. G. Winter (1999). From organizational routines to dynamic capabilities, Citeseer.

Zucker, L. G. (1986). "Production of trust: Institutional sources of economic structure, 1840–1920." Research in organizational behavior.

APPENDICES

Appendix A: Consent Form

Consent for Participation in Survey

Research Title : Social Capital and Collaboration Networks
Principal Researcher: Ms. Dasuni Nawinna

1. I volunteer to participate in this research. I have been informed and understand that this study is designed to gather information about collaborations between banking organizations in Sri Lanka. I will be one of approximately 300 people being surveyed in this research.
2. I understand that my participation in this project is voluntary. I understand that I will not be paid for my participation. I may withdraw and discontinue participation at any time without penalty.
3. I understand that I have the right to decline to answer any question or to end the interview if I feel uncomfortable in any way during the interview session.
4. I understand that the 'participation' involves answering the survey through one of the following ways;
   a) Assisted Participation;
   The researcher will be available to assist me to understand the questions before filling the survey. I understand that this can be arranged according to my preference in the form of an interview or through a telephone call. The interview will last approximately 40 minutes. Notes will be written during the interview. The interview will be audio-recorded only on my consent. I understand that a copy of my transcribed interview can be obtained at my request and any part that I want removed will be deleted from records.
   b) Un-assisted Participation;
   I understand that I can also choose to fill the survey without any assistance from the researcher. I can choose from one of these options: printed version of survey or email-based survey or online survey.
5. I understand that the researcher will not identify me by name in any reports using information obtained from this interview, and that my confidentiality as a participant in this study will remain secure. Subsequent uses of records and data will be subject to standard data use policies which protect the anonymity of individuals and institutions.
6. Administrators or co-workers from my work place will neither be present at the interview nor have access to raw notes or transcripts. This precaution will prevent my individual comments from having any negative repercussions.
7. I understand that this research study has been reviewed and approved by the Human Research Ethics Committee of Curtin University in Perth, Australia. For questions regarding subjects, the Human Research Ethics Committee of Curtin University may be contacted through [Phone +61-8-9266 2784, Fax: +61-8- 9266 3793 or Email: hrec@curtin.edu.au].
8. I have read and understood the explanation provided to me. I have been given an opportunity to ask questions and all my questions were answered to my satisfaction. I voluntarily agree to participate in this study.
9. I have been given a copy of this consent form.

_____ _____ _____

Name Signature Date

_____

Signature of the Researcher

Please tick this box if you also agree to have this interview audio recorded ☐

For further information, please contact:
Ms. Dasuni Nawinna [Personal Tele: +94-773504553]

Appendix B: Information Sheet to Participants

Information to Participants

Research Title : Social Capital and Collaboration Networks
Principal Researcher : Ms. Dasuni Nawinna

1. Purpose and Background

This research is designed to investigate and understand the underlying dynamics of inter-bank collaborations and identify means for improving the collaboration capacity of banks based on the literature of social capital. It looks at how institutions can achieve benefits in a networked environment through its links and relationships. An online survey has been designed to gather the required data from the management level staff of banks and finance companies in Sri Lanka.

2. Your Consent

You are courteously invited to take part in this research project. Participation in any research project is voluntary. The purpose of this document is to explain all the procedures involved in this project to the potential participants. Please read this Statement carefully. If you agree to take part in the paper-based survey, please sign the consent form given to you and submit to the researcher. If you agree to take part in the online survey, you may click on the URL given in the email which will direct you to the online survey form and your consent to participate will be assumed.

4. Procedures

Participation in the survey will involve electronically giving consent and selecting the appropriate answers for the questions. The questions are mainly based on formal or informal relationships among the banks (such as agreements, partnerships or even operations such as interbank lending) and your opinion on some aspects of these relationships. If you wish to have further assistance, a telephone interview can be arranged. The interview will be conducted in English and it will take approximately 30 minutes to complete. It will be held at a mutually convenient time. With the consent of the participant, the conversation may be audio-recorded.

5. Possible Benefits

The findings of this research will offer new insights into how to strengthen the inter-bank collaborations and further enhance collective sustainability in the Sri Lankan banking industry. It will also benefit individual banks to better predict or manipulate their collaboration capacity. The findings will enrich the literature on social capital and inter-organizational systems.

6. Possible Risks

The potential risks associated with this study are minimal. The approximate time for answering survey is 15 – 30 minutes. The academic publications of this research will not include any information that may identify you or your institution.

7. Privacy, Confidentiality and Disclosure of Information
This survey does not capture your name or any identifiable personal information. The information gathered in this study will be secured so that it is accessible only to the researcher and the research supervisor. The analysis will be done in a way that prevents the identification of individuals or institution. Coded data will be securely stored for five years after final publication of the collected data, as prescribed by University regulations.

8. Results of Project
Please let us know whether you want to be informed when the results of the research become available.

10. Ethical Guidelines

This study has been approved under Curtin University's process for lower-risk Studies. (Ethics Approval Number: IS_14_14). This process complies with the National Statement on Ethical Conduct in Human Research (Chapter 5.1.7, 5.1.18 -5.1.21, Chapter 3). If you have any complaints about any aspect of the project, you may contact the research supervisor named below or the Curtin University Human Research Ethics Committee.

C/- Office of Research and Development, Curtin University of Technology,
GPO Box U1987, Perth WA 6845
Phone: +61-8- 92669223

13. Further Information, Queries or Concerns

If you require further information, wish to withdraw your participation or if you have any problems concerning this project, you can contact the principal researcher.

The researcher: Ms. Dasuni Nawinna School of Information Systems Curtin University	The research supervisor; Associate Professor John Venable School of Information Systems Curtin University
Telephone: +94 773 504553 Tel: +94 11 75 44118 Email:dasunin@gmail.com, d.nawinna@curtin.edu.au	Telephone : +618 9266 7054 Email : John.Venable@cbs.curtin.edu.au

Appendix C: Survey Instrument

Survey Part1

Code:

Common Questions

1. Please name the Bank/Finance Company you are working for. (Bank name will not be used in any publications. A code will be substituted for the bank name)

2. Please indicate the type of functional unit you belong to;

General Management		ICT Management	
Operations Management		HR Management	
Treasury Management		Other (please specify):	
Marketing & Cooperate Communication			

3. Please indicate the qualifications you have achieved.

Professional Qualification	Certificate in banking & finance (CBF)	
	Advanced certificate in banking & finance (ACBF)	
	Diploma in banking & finance	
	American Institute of Banking (AIB) certificate	
	AIB diploma	
Bachelors Degree		
Post-graduate Qualification		
Other		

4. Do you have any of the following memberships?

Membership Type	*Yes/No*		*Yes/No*
APB - Member		IBSL-Associate Member	
IBSL-Fellowship		IBSL-Student Member	

5. How long have you been working in the banking sector (number of years)?

Years	

6. Does your bank take part in any of the following **common events/ activities/ groups** that may allow the staff of your bank to blend with the staff of other banks? Please tick all choices that apply.

1.	Sports		7	Alumni associations	
2.	Cultural/ Ethnic (e.g. arts, music, theatre)		8	Skill development (e.g. toastmasters club etc.)	
3.	Religious or spiritual (e.g. religious programs, religious studies etc.)		9	Banking Industry Events (award ceremonies, conferences, meetings etc.)	
4.	Social clubs (rotary, lions etc.)		10	Political	
5.	Environment / welfare		11	Trade unions	
6.	Recreational (talent shows, social events.)		12	Events hosted by non-banking firms (clients)	
7.	Educational (trainings / workshops etc.)		13	Other (please specify)	

7. Considering all the activities you selected above, please indicate how often (approximately) your staff has the opportunity to socially interact with other banks' staff? (1: Never, 2: in every couple of years, 3: annually, 4: monthly, 5: weekly, 6: daily, Don't know: Leave blank)

Amana	1 2 3 4 5 6	HNB	1 2 3 4 5 6	People's	1 2 3 4 5 6	Lankaputhra	1 2 3 4 5 6
Axis	1 2 3 4 5 6	HSBC	1 2 3 4 5 6	Public B.	1 2 3 4 5 6	MBSL	1 2 3 4 5 6
BoC	1 2 3 4 5 6	ICICI	1 2 3 4 5 6	Sampath	1 2 3 4 5 6	NSB	1 2 3 4 5 6
Cargills	1 2 3 4 5 6	Indian B.	1 2 3 4 5 6	Seylan	1 2 3 4 5 6	Regional	1 2 3 4 5 6
Citibank	1 2 3 4 5 6	Indian O.	1 2 3 4 5 6	Standard Ch.	1 2 3 4 5 6	Sanasa	1 2 3 4 5 6
Comm	1 2 3 4 5 6	MCB	1 2 3 4 5 6	State B. India	1 2 3 4 5 6	SL Savings	1 2 3 4 5 6
Deutsche	1 2 3 4 5 6	NDB	1 2 3 4 5 6	Union Bank	1 2 3 4 5 6	SMIB	1 2 3 4 5 6
DFCC V	1 2 3 4 5 6	NTB	1 2 3 4 5 6	DFCC	1 2 3 4 5 6		
Habib	1 2 3 4 5 6	PABC	1 2 3 4 5 6	HDFC	1 2 3 4 5 6		

8. Does your bank maintain a close relationship with (have membership / exchange information / comply with standards of) any of the following bodies? Please tick all choices that apply.

Central Bank of Ceylon		CRIB (Credit Information)
SLBA (Banks' Association)		SLAASMB (Accounting & Auditing Monitoring Board)
APB (Association of Professional Bankers)		EPF (Employee provident fund)
IBSL (Institute of Bankers)		ICASL (Institute of Chartered Accountants SL)

7. With how many people from the management of other banks do you personally know? (Friends / family etc.) Please chose the approximate number of direct contacts in each bank (1: (None), 2: (1-2), 3: (3-4), 4: (5-6), 5: (7-10), 6: (More than 10), Don't know: Leave blank)

Amana	1 2 3 4 5 6	HNB	1 2 3 4 5 6	People's	1 2 3 4 5 6	Lankaputhra	1 2 3 4 5 6
Axis	1 2 3 4 5 6	HSBC	1 2 3 4 5 6	Public B.	1 2 3 4 5 6	MBSL	1 2 3 4 5 6
BoC	1 2 3 4 5 6	ICICI	1 2 3 4 5 6	Sampath	1 2 3 4 5 6	NSB	1 2 3 4 5 6
Cargills	1 2 3 4 5 6	Indian B.	1 2 3 4 5 6	Seylan	1 2 3 4 5 6	Regional	1 2 3 4 5 6
Citibank	1 2 3 4 5 6	Indian O.	1 2 3 4 5 6	Standard Ch.	1 2 3 4 5 6	Sanasa	1 2 3 4 5 6
Comm	1 2 3 4 5 6	MCB	1 2 3 4 5 6	State B. India	1 2 3 4 5 6	SL Savings	1 2 3 4 5 6
Deutsche	1 2 3 4 5 6	NDB	1 2 3 4 5 6	Union Bank	1 2 3 4 5 6	SMIB	1 2 3 4 5 6
DFCC V	1 2 3 4 5 6	NTB	1 2 3 4 5 6	DFCC	1 2 3 4 5 6		
Habib	1 2 3 4 5 6	PABC	1 2 3 4 5 6	HDFC	1 2 3 4 5 6		

8. Please indicate regarding which other banks you can agree with the following statements? Leave blank if you don't agree.

i. "We believe we **can rely on** this bank without any fear that they will take advantage of us or our bank even if the opportunity arises"

Amana Bank		HNB		People's Bank		Lankaputhra Dev.	
Axis Bank		HSBC		Public Bank Berhad		MBSL Savings	
Bank of Ceylon		ICICI Bank		Sampath Bank		NSB	
Cargills Bank		Indian Bank		Seylan Bank		Regional Dev.	
Citibank, N.A.		Indian Overseas Bank		Standard Chartered		Sanasa Development Bank	
Commercial Bank		MCB		State Bank of India		Sri Lanka Savings Bank	
Deutsche Bank AG		NDB		Union Bank - Col		SMIB	
DFCC Vardhana		NTB		DFCC			
Habib Bank		PABC		HDFC			

ii. "This bank has always **kept the promises** they made to us during the past dealings and has **fulfilled their responsibility** in agreements. Therefore, we can rely on this bank to abide by any future agreements"

Amana Bank		HNB		People's Bank		Lankaputhra Dev.	
Axis Bank		HSBC		Public Bank Berhad		MBSL Savings	
Bank of Ceylon		ICICI Bank		Sampath Bank		NSB	
Cargills Bank		Indian Bank		Seylan Bank		Regional Dev.	
Citibank, N.A.		Indian Overseas Bank		Standard Chartered		Sanasa Development Bank	
Commercial Bank		MCB		State Bank of India		Sri Lanka Savings Bank	
Deutsche Bank AG		NDB		Union Bank - Col		SMIB	
DFCC Vardhana		NTB		DFCC			
Habib Bank		PABC		HDFC			

iii. "This bank has a **good reputation** in the industry. Therefore, we would be willing to trust this bank to get the job done properly even without our monitoring"

Amana Bank		HNB		People's Bank		Lankaputhra Dev.	
Axis Bank		HSBC		Public Bank Berhad		MBSL Savings	
Bank of Ceylon		ICICI Bank		Sampath Bank		NSB	
Cargills Bank		Indian Bank		Seylan Bank		Regional Dev.	
Citibank, N.A.		Indian Overseas Bank		Standard Chartered		Sanasa Development Bank	
Commercial Bank		MCB		State Bank of India		Sri Lanka Savings Bank	
Deutsche Bank AG		NDB		Union Bank - Col		SMIB	
DFCC Vardhana		NTB		DFCC			
Habib Bank		PABC		HDFC			

9.

a) Please indicate the banks that your bank generally shares a good **understanding** with, and therefore relatively easier to work with compared to other banks.

Amana Bank		HNB		People's Bank		Lankaputhra Dev.	
Axis Bank		HSBC		Public Bank Berhad		MBSL Savings	
Bank of Ceylon		ICICI Bank		Sampath Bank		NSB	
Cargills Bank		Indian Bank		Seylan Bank		Regional Dev.	
Citibank, N.A.		Indian Overseas Bank		Standard Chartered		Sanasa Development Bank	
Commercial Bank		MCB		State Bank of India		Sri Lanka Savings Bank	
Deutsche Bank AG		NDB		Union Bank - Col		SMIB	
DFCC Vardhana		NTB		DFCC			
Habib Bank		PABC		HDFC			

b) Which of the following attributes may be a reason for this? Please tick all options that apply.

Similar vision ans goals		Similar ownership		Long-term relationship		Technical infrastructure	
Conformity to norms and values		Their hierarchy is similar to ours		Automated operations		Well trained staff	
High industry rank		Firm age		Compliance to industry standards		Friendly and collaborative staff	
Similar functional domain		Firm size is large		Use of shared systems		Other (please specify)	
Multi-cultural		Wide-spread branch network.		Exposure to global banking industry			

Survey Part 2 - Alternative Sections

Higher Management

1. Please indicate the banks that your bank has had **strategic partnerships** with?

Amana Bank		HNB		People's Bank		Lankaputhra Dev.	
Axis Bank		HSBC		Public Bank Berhad		MBSL Savings	
Bank of Ceylon		ICICI Bank		Sampath Bank		NSB	
Cargills Bank		Indian Bank		Seylan Bank		Regional Dev.	
Citibank, N.A.		Indian Overseas Bank		Standard Chartered		Sanasa Development Bank	
Commercial Bank		MCB		State Bank of India		Sri Lanka Savings Bank	
Deutsche Bank AG		NDB		Union Bank - Col		SMIB	
DFCC Vardhana		NTB		DFCC			
Habib Bank		PABC		HDFC			

2. What were the main goals of entering into such partnerships?

cost reduction		develop new capabilities		social responsibility / social service	
expand market presence		rural development		staff development	
Increase reputation		Increase collaboration with other banks		Knowledge sharing or R& D	
Increase income		Other (please specify)			

3. Please rate other banks according to the percentage of **shares** you hold. (A: fully owned, B: more than 50%, C: 50% -30 %, D: 30% - 10%, E: less than10%, F: None, Don't know: Leave blank);

Amana	1 2 3 4 5 6	HNB	1 2 3 4 5 6	People's	1 2 3 4 5 6	Lankaputhra	1 2 3 4 5 6
Axis	1 2 3 4 5 6	HSBC	1 2 3 4 5 6	Public B.	1 2 3 4 5 6	MBSL	1 2 3 4 5 6
BoC	1 2 3 4 5 6	ICICI	1 2 3 4 5 6	Sampath	1 2 3 4 5 6	NSB	1 2 3 4 5 6
Cargills	1 2 3 4 5 6	Indian B.	1 2 3 4 5 6	Seylan	1 2 3 4 5 6	Regional	1 2 3 4 5 6
Citibank	1 2 3 4 5 6	Indian O.	1 2 3 4 5 6	Standard Ch.	1 2 3 4 5 6	Sanasa	1 2 3 4 5 6
Comm	1 2 3 4 5 6	MCB	1 2 3 4 5 6	State B. India	1 2 3 4 5 6	SL Savings	1 2 3 4 5 6
Deutsche	1 2 3 4 5 6	NDB	1 2 3 4 5 6	Union Bank	1 2 3 4 5 6	SMIB	1 2 3 4 5 6
DFCC V	1 2 3 4 5 6	NTB	1 2 3 4 5 6	DFCC	1 2 3 4 5 6		
Habib	1 2 3 4 5 6	PABC	1 2 3 4 5 6	HDFC	1 2 3 4 5 6		

4. Please indicate the banks on behalf of which your bank offer **correspondent banking services**;

Amana Bank		HNB		People's Bank		Lankaputhra Dev.	
Axis Bank		HSBC		Public Bank Berhad		MBSL Savings	
Bank of Ceylon		ICICI Bank		Sampath Bank		NSB	
Cargills Bank		Indian Bank		Seylan Bank		Regional Dev.	
Citibank, N.A.		Indian Overseas Bank		Standard Chartered		Sanasa Development Bank	
Commercial Bank		MCB		State Bank of India		Sri Lanka Savings Bank	
Deutsche Bank AG		NDB		Union Bank - Col		SMIB	
DFCC Vardhana		NTB		DFCC			
Habib Bank		PABC		HDFC			

5. Please indicate which banks have joined with your bank to facilitate **syndicated loans** in the past? Please rate the other banks on a scale of 1 (lowest) to 5 (highest) according to the number of syndicated loans your bank has joined with each bank (leave blank of now aware);

Amana	1 2 3 4 5 6	HNB	1 2 3 4 5 6	People's	1 2 3 4 5 6	Lankaputhra	1 2 3 4 5 6
Axis	1 2 3 4 5 6	HSBC	1 2 3 4 5 6	Public B.	1 2 3 4 5 6	MBSL	1 2 3 4 5 6
BoC	1 2 3 4 5 6	ICICI	1 2 3 4 5 6	Sampath	1 2 3 4 5 6	NSB	1 2 3 4 5 6
Cargills	1 2 3 4 5 6	Indian B.	1 2 3 4 5 6	Seylan	1 2 3 4 5 6	Regional	1 2 3 4 5 6
Citibank	1 2 3 4 5 6	Indian O.	1 2 3 4 5 6	Standard Ch.	1 2 3 4 5 6	Sanasa	1 2 3 4 5 6
Comm	1 2 3 4 5 6	MCB	1 2 3 4 5 6	State B. India	1 2 3 4 5 6	SL Savings	1 2 3 4 5 6
Deutsche	1 2 3 4 5 6	NDB	1 2 3 4 5 6	Union Bank	1 2 3 4 5 6	SMIB	1 2 3 4 5 6
DFCC V	1 2 3 4 5 6	NTB	1 2 3 4 5 6	DFCC	1 2 3 4 5 6		
Habib	1 2 3 4 5 6	PABC	1 2 3 4 5 6	HDFC	1 2 3 4 5 6		

6. Which of the following standards does your bank (and banking systems) comply with (if any)?

Type of Standard	**Standards**	**Yes**
Accounting & Reporting standards	IFRS: International Financial Reporting Standard (New version)	
	IAS: International Financial Reporting Standard (Older version)	
	SLFRS	
	LKAS	
Industry regulatory standards	Basel II	
	Basel III	
	Central Bank: Directions, Determinations, and Circulars issued to Licensed Commercial Banks (Nov 2013)	
	Central Bank: Directions, Determinations, and Circulars issued to Licensed Specialized Banks (Nov 2013)	

Operations

7. Please indicate the banks that you **frequently communicate** with during work hours;

Amana Bank		HNB		People's Bank		Lankaputhra Dev.	
Axis Bank		HSBC		Public Bank Berhad		MBSL Savings	
Bank of Ceylon		ICICI Bank		Sampath Bank		NSB	
Cargills Bank		Indian Bank		Seylan Bank		Regional Dev.	
Citibank, N.A.		Indian Overseas Bank		Standard Chartered		Sanasa Development Bank	
Commercial Bank		MCB		State Bank of India		Sri Lanka Savings Bank	
Deutsche Bank AG		NDB		Union Bank - Col		SMIB	
DFCC Vardhana		NTB		DFCC			
Habib Bank		PABC		HDFC			

8. Please indicate the banks with which your bank **frequently exchanges important information** through email, fax etc.;

Amana Bank		HNB		People's Bank		Lankaputhra Dev.	
Axis Bank		HSBC		Public Bank Berhad		MBSL Savings	
Bank of Ceylon		ICICI Bank		Sampath Bank		NSB	
Cargills Bank		Indian Bank		Seylan Bank		Regional Dev.	
Citibank, N.A.		Indian Overseas Bank		Standard Chartered		Sanasa Development Bank	
Commercial Bank		MCB		State Bank of India		Sri Lanka Savings Bank	
Deutsche Bank AG		NDB		Union Bank - Col		SMIB	
DFCC Vardhana		NTB		DFCC			
Habib Bank		PABC		HDFC			

Treasury

9. Please rate the other banks on a scale of 1 (lowest) to 5 (highest) according to the **number of money market transactions** your bank engages with other banks as a daily average. (leave blank if not aware);

Amana	1 2 3 4 5 6	HNB	1 2 3 4 5 6	People's	1 2 3 4 5 6	Lankaputhra	1 2 3 4 5 6
Axis	1 2 3 4 5 6	HSBC	1 2 3 4 5 6	Public B.	1 2 3 4 5 6	MBSL	1 2 3 4 5 6
BoC	1 2 3 4 5 6	ICICI	1 2 3 4 5 6	Sampath	1 2 3 4 5 6	NSB	1 2 3 4 5 6
Cargills	1 2 3 4 5 6	Indian B.	1 2 3 4 5 6	Seylan	1 2 3 4 5 6	Regional	1 2 3 4 5 6
Citibank	1 2 3 4 5 6	Indian O.	1 2 3 4 5 6	Standard Ch.	1 2 3 4 5 6	Sanasa	1 2 3 4 5 6
Comm	1 2 3 4 5 6	MCB	1 2 3 4 5 6	State B. India	1 2 3 4 5 6	SL Savings	1 2 3 4 5 6
Deutsche	1 2 3 4 5 6	NDB	1 2 3 4 5 6	Union Bank	1 2 3 4 5 6	SMIB	1 2 3 4 5 6
DFCC V	1 2 3 4 5 6	NTB	1 2 3 4 5 6	DFCC	1 2 3 4 5 6		
Habib	1 2 3 4 5 6	PABC	1 2 3 4 5 6	HDFC	1 2 3 4 5 6		

10. Please rate the other banks on a scale of 1 (lowest) to 5 (highest) according to the **maximum credit level** your bank will give to each bank. (leave blank if not aware);

Amana	1 2 3 4 5 6	HNB	1 2 3 4 5 6	People's	1 2 3 4 5 6	Lankaputhra	1 2 3 4 5 6
Axis	1 2 3 4 5 6	HSBC	1 2 3 4 5 6	Public B.	1 2 3 4 5 6	MBSL	1 2 3 4 5 6
BoC	1 2 3 4 5 6	ICICI	1 2 3 4 5 6	Sampath	1 2 3 4 5 6	NSB	1 2 3 4 5 6
Cargills	1 2 3 4 5 6	Indian B.	1 2 3 4 5 6	Seylan	1 2 3 4 5 6	Regional	1 2 3 4 5 6
Citibank	1 2 3 4 5 6	Indian O.	1 2 3 4 5 6	Standard Ch.	1 2 3 4 5 6	Sanasa	1 2 3 4 5 6
Comm	1 2 3 4 5 6	MCB	1 2 3 4 5 6	State B. India	1 2 3 4 5 6	SL Savings	1 2 3 4 5 6
Deutsche	1 2 3 4 5 6	NDB	1 2 3 4 5 6	Union Bank	1 2 3 4 5 6	SMIB	1 2 3 4 5 6
DFCC V	1 2 3 4 5 6	NTB	1 2 3 4 5 6	DFCC	1 2 3 4 5 6		
Habib	1 2 3 4 5 6	PABC	1 2 3 4 5 6	HDFC	1 2 3 4 5 6		

11. Please rate the other banks on a scale of 1 to 5 according to the average number of **FOREX** transactions with each bank per day. (leave blank if not aware);

Amana	1 2 3 4 5 6	HNB	1 2 3 4 5 6	People's	1 2 3 4 5 6	Lankaputhra	1 2 3 4 5 6
Axis	1 2 3 4 5 6	HSBC	1 2 3 4 5 6	Public B.	1 2 3 4 5 6	MBSL	1 2 3 4 5 6
BoC	1 2 3 4 5 6	ICICI	1 2 3 4 5 6	Sampath	1 2 3 4 5 6	NSB	1 2 3 4 5 6
Cargills	1 2 3 4 5 6	Indian B.	1 2 3 4 5 6	Seylan	1 2 3 4 5 6	Regional	1 2 3 4 5 6
Citibank	1 2 3 4 5 6	Indian O.	1 2 3 4 5 6	Standard Ch.	1 2 3 4 5 6	Sanasa	1 2 3 4 5 6
Comm	1 2 3 4 5 6	MCB	1 2 3 4 5 6	State B. India	1 2 3 4 5 6	SL Savings	1 2 3 4 5 6
Deutsche	1 2 3 4 5 6	NDB	1 2 3 4 5 6	Union Bank	1 2 3 4 5 6	SMIB	1 2 3 4 5 6
DFCC V	1 2 3 4 5 6	NTB	1 2 3 4 5 6	DFCC	1 2 3 4 5 6		
Habib	1 2 3 4 5 6	PABC	1 2 3 4 5 6	HDFC	1 2 3 4 5 6		

HR

12. What percentage of staff in your bank usually get involved in common events/ activities/ groups similar to above mentioned?

More than 50%	**B**	30 - 50%		10 - 30%	
Less than 10%		**None**		**Don't Know**	

13. Please indicate the overall ethnic variety of your bank's staff in general;

	A	B	C	D	E	F	G
Sinhalese	More than 75%	50%-75%	25%-50%	10%-25%	Less than10%	None	Don't know
Tamils	More than 75%	50%-75%	25%-50%	10%-25%	Less than10%	None	Don't know
Muslims	More than 75%	50%-75%	25%-50%	10%-25%	Less than10%	None	Don't know
Other	More than 75%	50%-75%	25%-50%	10%-25%	Less than10%	None	Don't know

14. Please indicate the overall religious variety of your bank's staff in general;

Buddhists	A: > 75%	B: 50-75%	C: 25-50%	D: 10-25%	E: Less than10%	F: None	G:Don't know
Hindus	A: > 75%	B: 50-75%	C: 25-50%	D: 10-25%	E: Less than10%	F: None	G:Don't know
Islam	A: > 75%	B: 50-75%	C: 25-50%	D: 10-25%	E: Less than10%	F: None	G:Don't know
Christians	A: > 75%	B: 50-75%	C: 25-50%	D: 10-25%	E: Less than10%	F: None	G:Don't know

15. Please answer the following questions on the collaborative culture in your firm;

Question	Yes
a) Does your bank encourage staff to collaborate and develop relationships with the relevant counterparts in other banks?	
b) Does your bank recognize collaborative talents or achievements (with other banks) when staffs are reviewed for promotions?	
c) Does your bank have any organizational norms or values that support information sharing with other banks?	
a) Do you encourage staff to participate in joint workshops, short trainings or meetings to share knowledge and learn about other banks' interests and capabilities?	

16. Please indicate the banks with which your bank has agreements for staff training?

Amana Bank		HNB		People's Bank		Lankaputhra Dev.	
Axis Bank		HSBC		Public Bank Berhad		MBSL Savings	
Bank of Ceylon		ICICI Bank		Sampath Bank		NSB	
Cargills Bank		Indian Bank		Seylan Bank		Regional Dev.	
Citibank, N.A.		Indian Overseas Bank		Standard Chartered		Sanasa Development Bank	
Commercial Bank		MCB		State Bank of India		Sri Lanka Savings Bank	
Deutsche Bank AG		NDB		Union Bank - Col		SMIB	
DFCC Vardhana		NTB		DFCC			
Habib Bank		PABC		HDFC			

ICTs

17. Please tick all the options that are available in your organization.

Does your bank has following;		**Does your bank allow the following for the staff**	
Internal Core-Banking software?		Internet access	
Knowledge Management System		Access to other bank websites	
Computerized auditing tool?		Access to social networking sites (Facebook etc.)	
Treasury Management system (e.g. SunGard)		Access personal email	
inter-organizational software		**Does your bank own following?**	
Intranet / OAS		Own ATM infrastructure?	
Website		Payment Gateway	
Does your bank offer following services?		**Does your bank participate in the following Intermediate Systems OR intermediate service?**	
Card services?		Sri Lanka Interbank Payment System (SLIPS)	
Internet banking		Cheque Imaging and Truncation System (CITS)	
Tele banking		US $ Clearance System	
Mobile banking		LankaPay Common ATM Switch	
Card swipes		SWIFT messaging system	

		LankaSettle System (RTGS + Central Depository System + Scripless Securities Settlement System)	
Does your bank has following ICT HRs		Sampath Interbank Link (ATM interconnect network)	
Software development team		LankaSign Certification Service Provider	
IT unit		Credit Information Bureau -CRIB	
IT systems maintenance unit		Reuters Messenger	
IT training unit		Western Union	
An e-banking unit			

18. Which banks have ATM sharing agreements with you bank?

Amana Bank		HNB		People's Bank		Lankaputhra Dev.	
Axis Bank		HSBC		Public Bank Berhad		MBSL Savings	
Bank of Ceylon		ICICI Bank		Sampath Bank		NSB	
Cargills Bank		Indian Bank		Seylan Bank		Regional Dev.	
Citibank, N.A.		Indian Overseas Bank		Standard Chartered		Sanasa Development Bank	
Commercial Bank		MCB		State Bank of India		Sri Lanka Savings Bank	
Deutsche Bank AG		NDB		Union Bank - Col		SMIB	
DFCC Vardhana		NTB		DFCC			
Habib Bank		PABC		HDFC			

19. Which ATM switches does your ATM system use?

BoC switch		Sampath Interbank Link	
Commercial Bank switch		Lanka Pay (Common Switch)	

20. Do your systems comply with following standards? Please tick the relevant column in front of each.

Standards	
ISO TC68: (Technical Committee for Financial services); *core banking, financial instruments, financial services securities*	
JTC 1 (Joint Tech. Committee 1 of ISO + International Electro Tech. Commission (IEC)); *worldwide ICT standards for business and consumer applications*	
ASC X9 (Accredited Standards Committee X9)	
INCITS (Inter National Committee for Information Tech. Standards)	
NIST (National Institute of Standards and Tech)	
FIPS (Federal Information Processing Standards)	
PCI (DSS) (Payment Card Industry Data Security Standard)	
IETF: (Internet Engineering Task Force); *Internet standards*	
UN/ CEFACT; *International EDI standards for XML elec. trade docs.*	
SWIFT: *financial messaging standard*	
IFX: Interactive Financial exchange protocol	
FpML: Financial products markup language	
XBRL: Extensible Business Reporting language	
TWIST (Transaction Workflow Innovation Standards)**:** *bank service billing, payments, wholesale financial transaction processing, administration of bank accounts*	

Appendix D: Descriptive Statistics

Indicators of Structural Dimension: Effective Network Size					
Indicator variable	Count	Minimum	Maximum	Mean	Standard Deviation
STR 1	34	0.0000	4.8462	1.051282	1.7183740
STR 2	34	0.0000	8.7000	2.069356	2.5594956
STR 3	34	0.0000	22.0714	4.005724	4.2677990

Indicators of Relational Dimension: In Degree Centrality					
Indicator variable	Count	Minimum	Maximum	Mean	Standard Deviation
REL 1	34	0.0000	6.0000	.617647	1.5377021
REL 2	34	0.0000	15.0000	4.882353	4.0881551
REL 3	34	0.0000	13.0000	3.352941	3.3473857

Indicators of Cognitive Dimension: Closeness Centrality					
Indicator variable	Count	Minimum	Maximum	Mean	Standard Deviation
COG 1	34	.0294	.2129	.172626	.0492924
COG 2	34	.0294	.3548	.279324	.0615677
COG 3	34	.0846	.1833	.107738	.0226365

Indicators of Inter-Organizational Collaborations (non-network indicators)					
Indicator variable	Count	Minimum	Maximum	Mean	Standard Deviation
COL 1	34	0	31	6.12	8.463
COL 2	34	0	16	4.94	5.116
COL 3	34	0	8	2.15	2.732

Indicators of Performance					
Indicator variable	Count	Minimum	Maximum	Mean	Standard Deviation
PF 1	34	1.00	15.00	4.7390	2.95532
PF 2	34	-.23	5.80	1.6557	1.26755
PF 3	34	-5.63	35.50	12.8663	8.30995

Indicators of CSR Disclosure					
Indicator variable	Count	Minimum	Maximum	Mean	Standard Deviation
CSR 1	34	0	7	3.18	2.022
CSR 2	34	.10	99.00	23.6671	30.19159

Appendix D: Publications Arising from this Thesis

1. Nawinna, D., Venable, J.R. 2016, 'The Role of Social Capital and ICT in Corporate Social Responsibility in a Developing Economy: An Empirical Study of the Finance Industry in Sri Lanka', SIG Global Development Pre-ECIS Workshop, Istanbul, Turkey, June 12, 2016. (ISBN: 978-0-9976176-7-2)

2. Nawinna, D., Venable, J.R. 2016, 'The Role of Social Capital and ICT in Inter-Firm Collaboration on Syndicated Development Loans: An Empirical Study of the Finance Industry in Sri Lanka', 9th Annual SIG Global Development Workshop, Dublin (Ireland), 10 December, 2016