Networking Capability Development in New Venture Internationalisation: A Theory Building Approach

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Abstract

This thesis aims to explore *how* technology start-ups build dynamic capabilities in networking to enable their new venture internationalisation (NVI). Positioned within the theoretical context of international entrepreneurship research, this thesis draws on the strategic management, entrepreneurship, and international business literature. Specifically, this thesis draws on three theoretical perspectives: (1) dynamic capabilities, (2) networking and social capital, and (3) NVI theory. Together this study combines Helfat et al. (2007) asset orchestration framework along with Nahapiet and Ghoshal's (1998) three dimensions of social capital as a theoretical lens to explore how various networking activities enable or inhibit NVI. Specifically, this thesis explores three overarching network processes, with respect to how international new ventures (INVs) (1) create, (2) extend, and (3) modify their social capital in high-technology markets.

The empirical context is Scottish and Australian medical technology start-ups that compete in the global medical technology sector, a distinct sector of the wider life sciences industry. Methodologically, this an interpretivist study, which takes an abductive approach to building theory from longitudinal multiple case study research. The focal actor (i.e. level of analysis) is the INV, while the unit of analysis is the focal actor's network relationships. Data collection and analysis took place over three iterative phases drawing on multiple primary and secondary data sources and processual analytical techniques. To collect these data, this thesis used semi-structured interviews drawing on the critical incident and narrative sequence techniques along with documents, and observation. This study began with a purposeful sample of eight medical technology start-ups, and as findings emerged, a theoretical sample of four cases, along with visual maps, conceptually ordered displays and case-ordered effects matrices helped focus and refine the cross-case analysis. From the emergent cross-case data analysis, three overarching aggregate categories were found to aggregate eleven second-order themes, which aggregate several first-order concepts.

The overarching finding of this thesis is that networking capability development is an affect-based emergent process that enables NVI. Specifically, this thesis makes three contributions to knowledge. The primary contribution of this thesis takes a step towards a process theory of networking capability development. Therefore, this study identifies networking capability as one particular type of dynamic capability that enables NVI. Secondly, this thesis begins to unlock the black box of networking by identifying several networking activities that underpin the network-enhancing, network-delaying, and network-modifying process, which triggers, enables, and accelerates a virtuous cycle of networking capability development. Finally, this thesis argues that learning from delays and nurturing core ties helps shift technology start-ups' reliance from impersonal relations towards future aspirations to internalise operations. A discussion of these findings then outlines the implications for theory, policy, and practice. This study closes with a discussion on research limitations and recommends new avenues for future research.

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Dedication

To the loving memory of my father, Rev. Roger F. Warner…

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As I write these acknowledgements I vividly remember the days, weeks, and months where I genuinely thought this day would never arrive. The fact that I am now writing this on a warm summer evening makes every aspect of this journey seem more worthwhile. However, where I sit today has not been without help, and I would like to take the opportunity to thank everyone who has travelled with me on this journey.

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Karl Warner
July 4th 2014, Edinburgh, Scotland.

Declaration of Originality

No portion of the work referred to in the thesis has been submitted in support of an application for another degree or qualification of this or any other university or other institute of learning.

I declare that the thesis embodies the results of my own work. Following normal academic conventions, I have made due acknowledgement of the work of others.

Copyright Statement

List of Abbreviations

AB	Affinity bonding
ACAP	Absorptive capacity
AIM	Alternative Investment Market (London Stock Exchange)
ASX	Australian Stock Exchange
BAS	Business angel syndicate
Biotech	Biotechnology
BMES	Biomedical Engineering Society
BRIC	Brazil, Russia, India, and China
CEO	Chief Executive Officer
CFO	Chief Financial Officer
COO	Chief Operations Officer
CSO	Chief Scientific Officer
CTO	Chief Technology Officer
DB	Dependency bonding
DC	Dynamic capabilities
DTI	Department of Trade and Industry
ECG	Electrocardiography
ETS	Eliminating ties
EU	European Union
FDA	The US Food and Drug Administration
FDI	Foreign direct investment
FTE	Full-time equivalent
GAB	Global acceptance bridging
GFC	Global financial crisis
GRB	Global referral bridging
GSB	Global search bridging
HBA	Home base augmenting cross-border activities
HBE	Home base exploiting cross-border activities
IB	International business
IBG	Impassive bonding
IE	International entrepreneurship
IJV	International joint venture
IMP	Industrial marketing and purchasing
INV	International new venture
IPO	Initial public offering
IPR	Intellectual property rights
IPT	Internationalisation process theory
JV	Joint venture
KBV	Knowledge based view
KOL	Key opinion leader
LAB	Local acceptance bridging
LRB	Local referral bridging
LSB	Local search bridging
M&A	Mergers and acquisitions
Medtech	Medical technology
MHRA	Medicines and Healthcare Products Regulatory Agency
MNE	Multinational enterprise
NHS	National Health Service
NPD	New product development
NSM	Narrative sequence methods
NVI	New venture internationalisation
OECD	Organisation for Economic Co-operation and Development
OLI	Ownership, Location, and Internalisation advantages
PCT	Patent Cooperation Treaty
PTS	Prioritising ties
SME	Small and medium sized enterprise
R&D	Research and development
RBT	Resource based theory
RBV	Resource based view

RTS	Reconfiguring ties
S&M	Sales and marketing
SCF	Scottish Enterprise Co-Investment Fund
SFM	Strategic factor market
TCE	Transaction costs economics
TMT	Top management team
UK	United Kingdom
UNCTAD	United Nations Conference on Trade and Development
US	United States
VC	Venture capital
VN-ACAP	Value network absorptive capacity
WOS	Wholly owned subsidiary

1 - Introduction

Chapter Aim

To introduce and provide an overview on the purpose of this thesis.

Chapter Objectives

- To introduce the research focus and contextualisation.
- To present the aim and objectives of the research.
- To illustrate the content structure of this PhD thesis.

1.1 Introduction

This thesis explores *how* technology start-ups build dynamic capabilities in networking to enable their new venture internationalisation (NVI). This introductory chapter therefore provides an overview of the thesis. It is important to emphasise this is an exploratory study that emerged from identifying a research problem within the global medical technology sector. Therefore, the researcher followed an "abductive" (Dubois and Gadde, 2002) approach whereby he iterated between fieldwork and literature. The following sections then provide a research background and context on some of the growth challenges that medical technology start-ups face. Following an initial discussion of the research context, this chapter will explain the aim, objectives, and methodology of this research. Finally, this chapter will present the content structure of this thesis.

1.2 Research Background and Contextualisation

The core purpose of this research is to understand *how* technology start-ups are able to pursue early growth and development in international markets. This study therefore positions itself within the field of international entrepreneurship (IE) research (Oviatt and McDougall, 1994; Autio et al. 2000; Zahra et al. 2000; Jones and Coviello, 2005). A central reason why the researcher decided to pursue doctoral research was due to his interest in how entrepreneurs can grow their technology start-ups into highly profitable international businesses (Shrader et al. 2000; Zahra et al. 2000; Autio et al. 2000). The second motivator to pursue doctoral research was that the researcher wanted to explore a high-technology setting that was theoretically relevant to the field of IE (Crick and Jones, 2000; Coeurderoy and Murray, 2008; Filatotchev et al. 2009). Therefore, the researcher developed an interest in the life sciences due to the knowledge-intensive and global nature of this industry (Powell et al. 2005; Gassman and Keupp, 2007; Ernst and Young, 2008; Jones et al. 2011).

Following initial research, it was apparent that there is often gulf in life science entrepreneurs' scientific and commercial capabilities (George et al. 2001; Colombo and Grilli, 2005; Hine and Kapeleris, 2006; Rothaermel and Deeds, 2006). These findings were then a central reason for pursuing IE research within the life sciences industry. Secondly, given the complex industry architecture of most technology-based sectors, internationalisation is often a prerequisite for survival and growth (Preece et al. 1999; Autio, 2005; Brännback et al 2007). This research then drove the initial decision to embark on a PhD due to the disparity and interplay between doing "good science" and learning to be

commercially capable within high-technology international markets (Fontes and Coombs, 1997; Crick and Jones, 2000; George, 2005; Onetti et al. 2012).

Based on these motivations, the researcher decided to examine these issues within the "global medical technology sector" (Frost and Sullivan, 2008). Academics (Chatterji, 2009), policy makers (Scottish Enterprise, 2011; AusBiotech, 2013), regulators (MHRA, 2013) and industry analysts (Frost and Sullivan, 2008) all emphasise that research and development (R&D), production, sales, and marketing of a medical technology (i.e. medtech) is a highly globalised activity. Therefore, new, existing or a combination of medical technologies underpin the commercialisation of medical devices (Mehta, 2008). The United States (US) Food and Drug Administration (FDA) define a medical device as:

> An instrument, apparatus, implement, machine, contrivance, implant, in vitro reagent, or other similar or related article, including a component part, or accessory, which is […] used in the diagnosis of disease or other conditions, or in the cure, mitigation, treatment, or prevention of a disease, in *man* or other *animals* (US FDA, 2014).

Whereas, the European commission in their "EU Medical Device Directive 2007/47/ec" are narrower in their definition as they define a medical device as:

> Any instrument, apparatus, appliance, software, material or other article, whether used alone or in combination, including the software intended by its manufacturer to be used specifically for diagnostic and/or therapeutic purposes and necessary for its proper application, which – is intended by the manufacturer to be used for *human beings* (EU Medical Device Directive 47/E, 2007: 23).

Additionally, the European Commission argue the "legal manufacturer" of a medical device should intend to manufacture the device for the purpose of *human beings* and not *animals*. The European Commission therefore define the legal manufacturer as "the person who is responsible for the design, manufacture, packaging and labelling of a device before it is placed on the market *under his own name*, regardless of whether these operations are carried out by the person himself or on his behalf by a third party" (MHRA, 2014). Thus, the pivotal provision regulating a medical device manufacturer – i.e. the innovator (Teece, 1986) – is placing the medical device on the market "under his own name" (Emergo Group, 2007). Relatedly, the US FDA's 510(k) regulatory approval for medical devices also follow similar protocols (FDA, 2013). Consequently, this clause has important implications for the medical device manufacturer as they can subcontract various business activities such as design,

manufacture, packaging, and labelling operations of their medical device (Schnoll, 2007; Emergo Group, 2007; Higson, 2010). Therefore, in line with Coviello and Munro (1997), network relationships have a crucial role in the internationalisation process of new and small technology based firms.

Mehta (2008) also classifies medical device companies on two distinct types of markets – commodity products and innovative medical device products. That is, the former are commodity products (e.g. wound dressings, blood bags) which are mainly sold by healthcare multinational enterprises (MNEs) (e.g. Johnson and Johnson), whereas the latter are more high-value, R&D intensive products (e.g. pacemakers, spinal stents) that are invented by small and medium sized enterprises (SMEs) and MNEs (2008: 8). Consequently, these regulations have meant that budding entrepreneurs who are often inventors of unique medical technologies have capitalised on the global opportunity to commercialise a medical device (Oviatt et al. 1993; Chatterji, 2009). Frost and Sullivan (2008) also report that the "innovative" medical device sector comprises of "cardiovascular, orthopaedic, general surgical, neurological, urological, gynaecological, endoscopic, and ophthalmic market segments." Mehta (2008: 8) also categorises these innovative medical devices as either (1) implants (e.g. artificial heart valves), (2) non-invasive (ECG monitors), or (3) minimally invasive (e.g. catheters) devices. Therefore, in line with Oviatt et al. (1993) original research on "global start-ups" in the medical technology sector, the researcher developed a primary interest in the "innovative" segment of the medical device sector.

The researcher also developed an interest in the medical technology sector due to its unique positioning with the wider life sciences industry. Life Sciences Scotland (2009) – a division of Scottish Enterprise – define the life sciences as reflecting "a wide range of activity including the discovery, research, development and manufacture of therapeutics; diagnostics; medical devices and platform technologies as well as the specialist suppliers of products and services necessary for these organisations to function." Scottish Enterprise (2011) also report that medical technology is a "global industry sector within the wider life sciences industry." Interestingly, Mehta (2008) argues innovative medical device companies often have shorter product life cycles and are more dynamic in their new product development (NPD) in comparison to new biotechnology firms.

Murray (2004) also reports these shorter product life cycles in medical technology are due to the technological distinction between engineering and scientific disciplines. That is, the

Biomedical Engineering Society (BMES) define biomedical engineering as a discipline that "uses traditional engineering expertise to analyse and solve problems in biology and medicine with the objective of providing an overall enhancement of healthcare" (Lee, 2010:2). Thus, biomedical engineers discover inventions through a multidisciplinary approach towards mechanical, materials, and electrical engineering (Murray, 2004). Whereas, biotechnology and pharmaceutical discoveries emerge from pharmacology, biotechnology, chemistry, and genetic engineering disciplines (Hine and Kapeleris, 2006). Therefore, Industry Canada (2013) describe an important distinction between these disciplines is medical devices *temporarily* or *permanently* replace a function in the body, while pharmaceuticals are *absorbed* into the human body to perform their intended functions.

Academic (Chatterji, 2009), policy (Scottish Enterprise, 2011) and consultancy (Frost and Sullivan, 2008) based research also reports that the global medical technology sector is highly profitable and core growth sector for most advanced economies. For example, Scottish Enterprise (2011) reports on findings made by Health Research International (2011) who estimate the global medical technology sector was valued at US$327 billion, with a predicted annual growth rate of 5.4%, reaching a value of US$424.5 billion by 2015. Related research commissioned by Industry Canada (2013) also reports that the "global medical device sector" includes 27,000 firms worldwide, and employs about one million people. Moreover, these policy makers emphasise this is a "global industry" which traditionally has a low level of industry concentration, with no dominant firm. However, Mehta (2008) reports in recent years, a few global players (e.g. Medtronic) continue to dominate this sector, leaving early stage innovation firms to occupy a global niche in this device industry.

Therefore, Crick and Jones (2000) emphasise a core challenge that new and small technology firms' face is the imperative of exploiting their innovation in underdeveloped international technology markets. The medical technology sector was therefore of interest to the researcher given that technology start-ups can capitalise on industry change that incumbents have yet to identify within international niche markets (Jolly et al. 1992; Oviatt et al. 1995; Preece et al. 1999; Kuemmerle, 2002). Nonetheless, Carpenter et al. (2003: 806) emphasise Mitchell et al. (1992: 419) original findings that "attempting to become an international medical player is risky" and found internationalisation was likely to have a negative effect on domestic (US) operations and firm survival. Relatedly, Karim and Mitchell (2000) in a

follow up historic study of the US medical sector found MNEs continue to dominate this industry sector through acquisition based corporate strategies.

Interestingly, the majority of the above research is set in the US medical technology sector. This is not surprising given that the US in 2012 accounted for a 36.3% market share of the entire global medical device sector (Industry Canada, 2013). In revenue terms, Industry Canada reports US dominance equates to US$118.9 billion of the global US$327.7 billion market valuation. Thereafter, Japan (9.9%), Germany (7.0%), China (4.3%), and France (4.1%) are the top five international markets for the sale of medical technology. Consequently, this implies for non-US based medical technology start-ups, the outlook must be international – usually US-oriented and in some cases global from inception (Oviatt et al. 1993; Chatterji, 2009). Moreover, Frost and Sullivan (2008) report an increasing trend is that entrepreneurial firms are looking towards the emerging BRIC markets (Brazil, Russia, India, and China) to exploit international opportunities. However, Industry Canada report in 2012 that the BRIC markets had a combined market value of US$26.2 billion, which is still less than 10% of the entire value of the global medical technology sector.

Nevertheless, recent research indicates that the high-technology landscape is changing as emerging markets move towards more knowledge-based economies (Saxenian, 2002; Fischer and Zedtwitz, 2004; Filatotchev et al. 2009; Tang and Hull, 2011). This research then reports that increasing amounts of entrepreneurs recognise R&D and knowledge transfer opportunities within the emerging markets. For example, Ernst and Young (2008) report on the increasing trend that Western biotechnology firms continue to subcontract R&D and production activities to emerging markets in order to reduce cost and accelerate commercialisation. In addition to this, recent research also reports on the growth of foreign clinical trials in countries such as Brazil, Cuba, and Turkey given technological advancements in their local healthcare systems (Thorsteinsdóttir, 2007; Karabag, 2011; Pregelj et al. 2011). Thus, in accordance with Jones et al. (2011b), it is apparent the internationalisation of life science new ventures is a highly globalised activity that takes place at all stages of the value chain.

Thus, it is evident that the global medical technology sector provides a theoretically relevant and rich industry context to conduct research within the field of IE. Since the industry architecture of this sector is complex, it is apparent that technology start-ups need to engage in various R&D, production, sales and marketing cross-border activities to ensure survival

and growth (Jones, 1999; Autio, 2005; Gassman and Keupp, 2007; Brännback et al 2007). Therefore, George's (2005) initial findings on the disparity and interplay between doing "good science" and learning to become commercially capable in a globally competitive environment is a problem that motivates this research.

1.3 Dynamic Capabilities, Networking, and New Venture Internationalisation

Given this contextual setting, dynamic capabilities (Teece et al. 1997; Eisenhardt and Martin, 2000; Zollo and Winter, 2002) has recently emerged within strategic management research as a useful perspective to explore *how* innovation-based firms sustain competitive advantage in environments marked by rapid technological and market change. Chapter 2 explains there are numerous conflicting definitions of dynamic capabilities, but Helfat and Peteraf (2009) note most contributions share the view that organisations use their dynamic capabilities to *change* their resource base. However, Zahra et al (2006) emphasises the seminal strategic management contributions are more relevant for established firms who possess *existing* dynamic capabilities. Whereas in entrepreneurship research, there is an important need to explore how "how dynamic capabilities develop, emerge, or evolve" in new ventures (2006:920). Consequently, section 2.3.3 emphasises that this study adopts Helfat et al. (2007: 4) definition of dynamic capability as "the capacity of an organization to purposefully create, extend, or modify its resource base."

Interestingly, the IE literature reports both conceptually (Young et al. 2003; Sapienza et al. 2006; Weerawardena et al. 2007) and empirically (Westhead et al. 2001; Knight and Cavusgil, 2004) on the resource and capability gaps which constrain NVI. For technology start-ups, a lack of resources and capabilities is a significant challenge due to intensive levels of human, intellectual, and financial capital needed to commercialise knowledge intensive products within the international marketplace (Burgel and Murray, 2000; Bell et al. 2003; Prashantham and Young, 2009). Chapter 3 describes that recent conceptual research argues dynamic capabilities are an essential part of a firm's resource base to enable NVI (e.g. Sapienza et al. 2006; Zettinig and Benson-Rea, 2008; Prashantham and Floyd, 2012). However, Vogel and Güttel (2013) in a recent bibliometric review confirm the majority of studies are still conceptual. In addition to these findings, Helfat et al. (2007) argue more research needs to explore the particular *types* of dynamic capabilities.

Consequently, to compensate for resource and capability gaps, it is now widely understood that network relationships can support NVI (Coviello and Munro, 1995, 1997; Casson, 1997;

Zhou et al. 2007; Fernhaber and Li, 2013). Coviello and Munro (1997: 365) define network relationships as "social and industrial relationships among for example, customers, suppliers, competitors, family, and friends." Additionally, researchers argue that networking (e.g. Dubini and Aldrich, 1991) and social capital (e.g. Nahapiet and Ghoshal, 1998; Adler and Kwon, 2002) are useful perspectives to examine how technology start-ups access resources to support various cross-border R&D (Zahra et al. 2003), production (Sherer, 2003), sales and marketing (Yli-Renko et al. 2002) activities. In Chapter 4, Table 4-1 and section 4.5 indicates there are multiple definitions of networking, which leads to the researcher's definition that *networking is the process of forming and strengthening ties through the exchange of information and resources to advance each actor's long-term development*. Consequently, Chapter 4 reviews the social capital literature and describes that there is growing consensus that social capital is an intangible asset that refers to resources that derive from a *network* of relationships (Payne et al. 2011).

However, section 4.2 reviews this literature and adopts Nahapiet and Ghoshal's (1998: 243) definition that social capital is "the sum of resources embedded within, available through, and derived from the network of relationships by an individual or social unit." Moreover, Chapter 4 emphasises that networking and social capital are distinct concepts, by adopting the view put forth by Watson (2007: 855) that "networking is the process of *enhancing* an [actor's] social capital." Thus, recent research suggests that technology start-ups need to *invest* in a stock of business and social relationships if they are to build social capital that supports NVI (Coviello, 2006; Chetty and Agndal, 2007 Presutti et al. 2007; Prashantham and Dhanaraj, 2010). Relatedly, Tang (2011: 389) notes that stimulating and facilitating networking remains a key approach in industrial policies and business support programmes at international, regional, national, and sub-national level to the enhance the competitiveness of SMEs (e.g. European Commission, 2008; OECD, 2007; UNCTAD, 2001).

Nevertheless, Mosey and Wright (2007) emphasise that since most "technology entrepreneurs" focus on building research led relationships; they will often struggle to create a valuable business network of relationships. Research on biotechnology start-ups has also found that even when such firms have access to industrial networks, some scientists are unable to exploit commercial opportunities or are unable to overcome inertia in their scientific networks (Maurer and Ebers, 2006). Consequently, Reuber and Fischer (1997: 810) argue when top management teams (TMTs) have greater international experience they are more likely to have access to a valuable network of relationships. However, research has

found that most technology entrepreneurs lack industrial experience and need to build a network of relationships from the ground up to support their growth and development (Vissa and Bhagavatula, 2012).

In the life sciences, networking is also a knowledge intensive, complex, and globally dispersed activity (Gassmann and Keupp, 2007). For example, Santoro and McGill (2005) found in some cases there are often only a handful of individuals or organisations across the world who are competent in the specific R&D, manufacture or sale of highly advanced life science technologies. In the start-up phase, this raises numerous collaboration risks, but the greatest concern is often the misappropriation of a new venture's intellectual property rights (IPR) (Pisano, 1991; Hayton, 2005). For example, Coriat and Orsi (2002) emphasise survival rates of technology start-ups operating in the US is lower than other foreign markets due to the constant threat of litigation battles. Therefore, research has found technology start-ups with insufficient experience in identifying, evaluating, and selecting appropriate partnerships, are more likely to make misguided decisions, which can end in the new venture's failure (Mudambi and Zahra, 2007).

Ernst and Young (2008) also argue the greatest risk for small life science firms is the challenge of selling a product to a network of customers in multiple countries. That is, prior to selling a product, life science new ventures need to apply for regulatory approval in each foreign market (MHRA, 2014). However, despite the global nature of the life sciences industry, the "triad regions" – North America, Europe and Asia-Pacific – have yet to agree on a global regulated standard. Thus, Rothaermel and Deeds (2006) identifies for life science start-ups, multiple regulatory approvals equates to high transaction costs that results in long NPD times that are often unaffordable, time consuming, and reduce commercial windows of opportunity. Additionally, Maurer and Ebers (2006) argues if life science firms overcome these initial growth challenges, there is often the challenge that existing customers can quickly become potential rivals by imitating their products and technologies.

Consequently, Mosey and Wright (2007) argue that the founder(s) existing experience, will often determine how well technology start-ups can build a network of customer relationships. For example, Ireland and Hine (2007) argue despite the growing amount of life science new ventures, the large incumbent pharmaceutical companies – the *big pharma* – and medical technology MNEs dominate the life sciences industry. This means a typical strategy for small technology firms is to target MNEs as a core customer due to the

dominance they have in global supply chains (Dunne et al. 2009). However, Burgel and Murray, (2000) report since technology start-ups are often commercially inexperienced and unable to demonstrate a proven record of international sales they often struggle to negotiate with large incumbent firms. Moreover, research also reports on challenges small technology firms face in attempting to build a network of customer relationships through various forms of international trade and/or foreign direct investment (FDI) (Bell, 1995; Coviello and Munro 1997, Jones, 1999; McNaughton, 2002).

Traditionally, technology start-ups would leverage their core asset – a globally protected patent – to access complementary assets in order to build and sustain a competitive advantage (Teece, 1986, Pisano, 1991). However, Larson (1992) reports that technology start-ups must use networks to build an advantage as relying on IPR as a formal mechanism is no longer sufficient to protect their strategic position. Therefore, the network perspective argues technology start-ups can informally use trust and social embeddedness within an existing network of relationships to maintain their network position on the global value chain (e.g. Thorelli, 1986; Johanson and Mattson, 1988). For example, if technology firms attempt to enter China, they often encounter the social and cultural hurdles of adapting to *guanxi* networks (Zhao and Aram, 1995; Zhou et al. 2007). Since generations of trust, obligation and reputation deeply engrain these networks (Park and Luo, 2001) such firms are likely to encounter what Johanson and Vahlne (2009) recently term as the "liabilities of outsidership." Johanson and Vahlne (2009) argue that firms will encounter this disadvantage if they are outside certain international networks. Consequently, despite the historic importance of networks, there is still limited conceptual (e.g. Larson and Starr, 1993; Hite and Hesterly, 2001) and empirical research (e.g. Hite, 2005; Coviello, 2006) on *how* new ventures build an emerging network of relationships.

Chapter 4 therefore reviews the organisational capabilities literature that examines the networking behaviour of international new ventures (INVs). Chapter 3 explains that the INV is unique organisational form that draws upon multiple strands of international business (IB), entrepreneurship and strategic management research (Zahra and George, 2002). Oviatt and McDougall (1994: 49) therefore define an INV as "a business organization that from inception, seeks to derive significant competitive advantage from the use of resources and the sale of output in multiple countries." Consequently, section 4.3 finds that this organisational capability research is fragmented and takes place at multiple of levels of analysis. For example, entrepreneurship researchers use various theoretical perspectives

such as relational capabilities (e.g. Brinckmann and Hoegl, 2011), alliance portfolio capabilities (Baum et al. 2000), and network management capabilities (Walter et al. 2006) to understand the strategic management of networks.

More interestingly, recent IE research has begun to use dynamic capabilities as lens to examine various aspects of networking behaviour through the "networking capability" concept (e.g. Fernhaber and McDougall, 2005; Weerawardena et al. 2007; Tolstoy and Agndal, 2010). However, section 4.4 reports that this research is still descriptive and is less clear on *how* INVs build networking capabilities. Consequently, Sapienza et al. indicate that dynamic capability research on what INVs "do and the resources they control, including the social capital they and their managers have amassed" would be "enlightening" to advance future research (2006: 930). Therefore, Chapter 5 addresses this research problem and section 5.3 defines *networking capability as the capacity of a focal actor to purposefully create, extend, or modify its social capital*. This, conceptualisation therefore seeks to address the above challenges that medical technology start-ups encounter, as it seems fruitful to take a dynamic capabilities perspective to explore networking capability development in NVI.

1.4 Research Aim and Objectives

Again, it is important to emphasise that the following research objectives are the eventual outcome of several years of "abductive" research (Dubois and Gadde, 2002). Chapter 6 therefore describes how the researcher retrospectively arrived at these eventual research objectives. Nevertheless, Chapter 6 emphasises that researcher's aim has never dramatically changed given the research background set out in the previous section of this introductory chapter. Therefore, based on this research background, the overarching aim of this thesis is:

To *explore how technology start-ups build dynamic capabilities in networking to enable their new venture internationalisation.*

Therefore, this study aims to achieve three overarching research objectives.

- ***Objective 1****: To explore* ***how*** *INVs create, extend, and modify their social capital in high-technology markets.*

- ***Objective 2:*** *To examine* ***why*** *specific networking activities enable or inhibit new venture internationalisation in high-technology markets.*

- ***Objective 3***: To determine ***which*** network processes underpin networking capability development in new venture internationalisation?

Objective 1*: To explore* ***how*** *INVs create, extend, and modify their social capital in high-technology markets.*

This research objective stems from the fact that scant research explores the development of networking capabilities in NVI. Chapter 2 therefore indicates one reason for this lack of research is due to the debate within strategic management research as to what dynamic capabilities represent and entail. Consequently, following a discussion on the dynamic capabilities debate, the researcher lays out his justification for using Helfat et al. (2007) asset orchestration framework to explore dynamic capability development. Chapter 3 confirms the asset orchestration framework is a useful approach to study how INVs build dynamic capabilities in high-technology markets. More specifically, Chapter 4 provides a theoretical overview of networking and social capital research, in order to explore how INVs create, extend, and modify their social capital in high-technology markets.

Consequently, the researcher intends to contribute to theory by achieving this research objective. Given the emergent nature of Helfat et al. (2007) framework, only a limited number of strategic management studies have yet to use this lens to pursue empirical research (e.g. Nambisan and Sawhney, 2011; Chadwick et al.. 2014). Therefore, to the researcher's knowledge, this is first entrepreneurship study to use this framework to explore dynamic capability development. Moreover, given the emergent use of this framework, to the researcher's knowledge, this is the first study to combine Helfat et al. (2007) with Nahapiet and Ghoshal's (1998) perspective on social capital to explore networking capability development. Thus, in Chapter 5 the researcher combines these theoretical lenses with the aim to contribute to IE and wider strategic management research.

Coviello and Jones (2004), describe the dearth of longitudinal and cross-national based research in the field of IE. Jones et al. (2011a) in a systematic review of IE research also discuss progress but call for additional longitudinal and cross-national research. Since the overarching theme of this thesis is one of *process*, it was necessary to design a longitudinal study that captured the true essence of capability development in NVI. Chapter 6 therefore describes the researcher's longitudinal multiple case study design (e.g. Eisenhardt, 1989;

Leonard-Barton, 1990; Gioia et al. 2013), which aims to provide a more fine-grained understanding of the activities that underpin networking capability development in NVI. Specifically, Chapter 6 outlines that the researcher took the opportunity to conduct longitudinal cross-national research in the UK and Australia. Since, the medical technology sector is global, it was interesting to conduct research with comparable medical technology start-ups who were unable to sell products to the domestic marketplace. Thus, given limited research on how INVs create, extend, or modify social capital (e.g. Arenius, 2002; Coviello, 2006; Prashantham and Dhanaraj, 2010), the researcher anticipates that the emergence of new networking activities will contribute to IE research.

Objective 2: *To examine* ***why*** *specific networking activities enable or inhibit new venture internationalisation in high-technology markets.*

This research objective stems from the need to ask *why* certain networking activities enable or inhibit NVI in high-technology markets. Miles and Huberman (1994) suggest that longitudinal research helps with exploring and describing how certain events and activities unfold, but it is important to ask why certain events or activities influence a phenomenon in the way they do. Chapter 7 therefore intends to summarise the various events that unfolded in each case firm. Following this, Chapter 8 will then aim to explore and describe various networking activities within the context of NVI, and then move onto ordering and explaining why certain networking influence NVI. To achieve this, Chapter 6 explains that this study uses various longitudinal data collection and analysis techniques to build theory from case study research.

Objective 3: To determine ***which*** network processes underpin networking capability development in new venture internationalisation?

This research objective aims to build theory through a longitudinal multiple-case study design. Given the abductive nature of this research (e.g. Dubois and Gadde, 2002) the final research objective intends to interpret the emergent findings at a higher level of abstraction. Chapter 6 therefore provides a detailed discussion on how the researcher intends to analyse and interpret raw data on which network processes underpin networking capability development in NVI. Indeed, by theorising on the network processes that underpin networking capability development, the researcher intends to contribute to theory, policy-making, and practice. Firstly, this study aims to contribute to the continued need for new process research in IB and IE research (Welch and Paavilainen-Mantymaki, 2014).

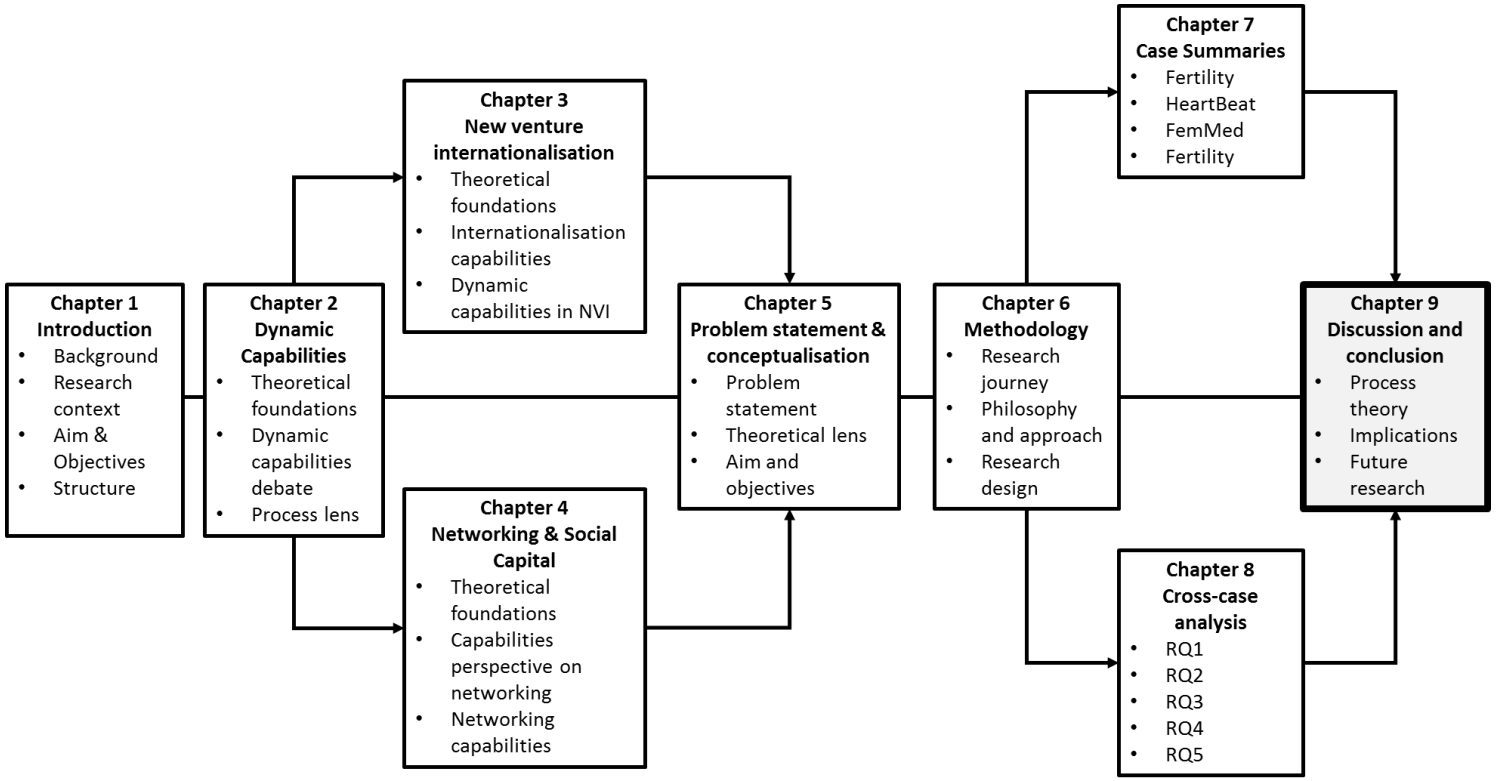
Secondly, this study aims to contribute to policy and practice by highlighting the challenges and opportunities that technology start-ups encounter with networking as they engage in NVI.

For example, by demonstrating the process of how technology start-ups build networking capability, it is anticipated this research will assist policy makers develop unique programmes to support NVI in high-technology markets. Specifically, the researcher anticipates this research will assist policy makers create a range of support mechanisms to help technology entrepreneurs build a high-value network of relationships that facilitates NVI. Additionally for practitioners, this study aims to provide entrepreneurs with a resource on how to identify various behaviours that are associated with the black box that is networking. Given the intangible nature of networking activities, the researcher anticipates that practitioners would expect a useful protocol on how to identify, measure, and assess the strength of one's networking capability. This thesis then aspires to achieve these requirements, by making an important step towards a process theory that supports a wider policy and commercial based readership.

1.5 Structure of Thesis

In summary, Chapter 1 introduces the background and contextual setting of this study. This chapter also highlights the core literature this study draws upon, along with the aim and objectives of this research. This chapter then provides an insight into how the researcher intends to achieve these emergent research objectives. Therefore, Figure 1-1 depicts the overall structure of this thesis. Chapter 2 will now discuss the selection of a theoretical lens from the dynamic capabilities literature to help navigate and focus this research study. Chapter 3 will then aim to review the IE literature that sheds light on the capability building process within INVs. Chapter 4 will then review the networking and social capital literature to shed light on the capability building process within INVs. Chapter 5 will then discuss the research problem by presenting the eventual aim, objectives, and research questions that drive this research. Chapter 6 will then describe the research methodology of this study, while Chapters 7 and 8 will report the within-case and cross-case findings on how technology start-ups build dynamic capabilities in networking to enable NVI. Finally, Chapter 9 will discuss these research findings in relation to existing literature and conclude on the major contributions of this research.

Figure 1-1: Thesis Structure



Source: The Author

2 – Dynamic Capabilities: An Emerging Theoretical Lens

Chapter Aim

To select a theoretical lens from the dynamic capabilities literature that helps navigate and focus this research study.

Chapter Objectives

- **To review the theoretical foundations that underpin the dynamic capabilities perspective.**
- **To examine the dynamic capabilities perspectives that offer a robust theoretical lens.**
- **To select a process lens that enables an exploration of the development of deployment of dynamic capabilities in technology-based firms.**

2.1 Introduction

This chapter aims to select a theoretical lens from the dynamic capabilities literature that helps navigate and focus this research study. The dynamic capabilities perspective is an area of strategic management research that has received significant attention, but also widespread debate and criticism due to multiple theoretical perspectives. Therefore, to select a robust theoretical lens, this chapter intends to achieve three objectives. Firstly, this chapter will review the theoretical foundations that underpin and unify the multiple dynamic capability perspectives. Secondly, this chapter will examine the dynamic capability perspectives that offer a robust theoretical lens. Finally, this chapter will select the most suitable process lens that enables an exploration of the development and deployment of dynamic capabilities. This chapter will therefore provide the researcher with a theoretical lens that will inform the arguments made in this thesis.

2.2 Dynamic Capabilities – Theoretical Foundations

Although there is significant debate in the dynamic capabilities literature, there is widespread agreement that Teece, Pisano and Shuen publication entitled *Dynamic Capabilities and Strategic Management* (1997), is the seminal and definitive founding paper (Barreto, 2010; Ambrosini and Bowman, 2009; Helfat and Peteraf, 2009). Moreover, Leiblein (2011) emphasises that having received 13,700 citations, Teece et al. (1997) is now one of strategic management's most recognised contributions. Teece et al. (1997: 516) define dynamic capabilities as "the firm's ability to integrate, build and reconfigure internal and external competencies to address rapidly changing environments." Thus, this framework of dynamic capabilities provides an analytical tool to understand how "private enterprise firms" sustain competitive advantage whilst operating in environments of rapid technological change (1997: 509).

Teece et al. (1997: 509) ground their framework in the argument that competitive advantage lies within dynamic capabilities that rest in the firms: path dependence (history), specific asset position (resource base) and distinctive organisational processes (routines). Thus, Teece et al. (1997) central thesis is that competitive advantage stems from dynamic capabilities rooted in high performance routines that operate inside the firm, which influence its future direction (i.e. new paths) and asset position within the wider environment. Since Teece et al. (1997), Barreto (2010) and other recent reviews (e.g. Ambrosini and Bowman, 2009; Helfat and Peteraf, 2009; Easterby-Smith and Prieto, 2008) report there is significant

debate and varied opinion on dynamic capabilities overall nature, purpose, context, development mechanisms and outcomes. For example, some scholars such as Teece (2000; 2007, 2012) maintain that dynamic capabilities seek to explain *how* innovation based firms sustain competitive advantage through revolutionary responses to environmental change. Whereas, other scholars argue dynamic capabilities aim to explain *how* firms continuously improve and adapt to more evolutionary forms of change (Eisenhardt and Martin, 2000; Zollo and Winter, 2002; Winter, 2003).

Within and amongst the seminal contributions, it also evident that scholars use various terminology (e.g. core competencies, distinctive capabilities, higher-order capabilities, organisational routines) to describe and investigate a firms involvement in strategic change. Rajagopalan and Spreitzer (1997: 49) define strategic change as "a difference in the form, quality, or state over time (Van de Ven and Poole, 1995) in an organization's alignment with its external environment." Consequently, Dosi et al. (2000: 4) were early to emphasise that the "terminological flotilla" is likely to burden organisational capability scholars with confusion and misdirection. Moreover, Easterby-Smith et al. (2009) also emphasise that the first ten years of dynamic capabilities scholarship is predominately conceptual and the limited empirical research is yet to adopt on a uniform theoretical lens. Zahra et al. (2006: 917) therefore emphasise that the emergent literature on dynamic capabilities and their role in value creation has become "riddled with inconsistencies, overlapping definitions, and outright contradictions." Arend and Bromiley (2009: 87) thus note these inconsistencies are so problematic, that they go as far to argue that scholars "should abandon the dynamic capabilities approach all together if it does not quickly develop a theoretical foundation."

However, Helfat and Peteraf (2009: 92) respond to Arend and Bromiley's critique, and argue: "Although dynamic capabilities began as an "approach" to understanding strategic change (Teece et al.. 1997), rather than a "theory," there are clearly identifiable theoretical foundations." The prime objective of this section will therefore review the theoretical foundations that underpin and unify the emerging dynamic capabilities "paradigm" (i.e. Augier and Teece, 2009). Table 2-1 therefore interprets this discussion on dynamic capabilities theoretical foundations.

Table 2-1: Dynamic Capabilities Theoretical Foundations

	Transaction Costs Theory	Resource Based Theory	Evolutionary Theory
Theoretical question	• *Why do firms exist*?	• *Why are firms different?*	• *How do firms adapt to external change*?
Ontology	• Coase (1937) • March and Simon (1958) • Cyert and March (1963)	• Penrose (1959) • Lippman and Rumlet (1982)	• Schumpeter (1934) • March and Simon (1958) • Cyert and March (1963)
Linkage to Teece et al.	• Positions	• Positions	• Processes • Paths
Seminal contributions	• Williamson (1975, 1985)	• Wernerfelt (1984) • Dierickx and Cool (1989) • Barney (1991)	• Nelson and Winter (1982) • Dosi et al. (2000)
Assumptions	• Bounded rationality • Opportunism	• Resource heterogeneity • Resource immobility	• Satisficing behaviour • Disequilibrium
Conditions	• Asset specificity • Uncertainty • Frequency	• Valuable • Rare • Non-imitable • Non-substitutable	• Strategy • Structure • Core Capabilities
Unit of analysis	• Transaction	• Resource	• Routine
Mechanism	• Static	• Predominately static	• Dynamic
Intended outcome	• Cost reduction	• Sustained competitive advantage	• Innovation based capabilities

Source: Based on Augier and Teece (2009)

Augier and Teece (2009) argue that evolutionary theory (Nelson and Winter, 1982) and transaction cost theory (Williamson, 1975, 1985) heavily influence dynamic capabilities as they share a behavioural (Cyert and March, 1963) heritage. Moreover, they argue March and Simon (1958) and Cyert and March's (1963) ideas on "bounded rationality", "opportunistic behaviour", "organisational slack" and "organisational routines" ontologically inform Williamson (1975, 1985) and Nelson and Winter's (1982) theories. Furthermore, Penrose's (1959) theory on the growth of the firm informs resource-based theory (RBT) (Wernerfelt, 1984; Dierickx and Cool, 1989; Barney, 1991) which is an important theoretical foundation of dynamic capabilities. The following sections will therefore introduce each of these theories and review the theoretical components that are most pertinent to the dynamic capabilities view of the firm.

2.2.1 Evolutionary Theory

Augier and Teece (2009: 412) argue Nelson and Winter's *An Evolutionary Theory of Economic Change* (1982) is the "most germane intellectual foundation in the dynamic

capabilities paradigm." Helfat and Peteraf (2009) also note that Nelson and Winter's (1982) evolutionary theory is the basis on which Teece et al. (1997) derives attention to distinctive processes and path dependencies. Behavioural theory (March and Simon, 1958; Cyert and March, 1963) along with Joseph Schumpeter's (1934; 1942) contributions on innovation, entrepreneurship, and economic change therefore underpin Nelson and Winter's (1982) evolutionary theory. Nelson and Winter (1982) build on these contributions and borrow basic ideas from biology as a ***metaphor*** to develop an evolutionary theory of capabilities that explains *how* innovation based firms (rather than population of firms in industries) adapt to external change (1982: 3). Cyert and March's (1963) assumptions that firms are motivated by profit and engaged in search to improve their profits, thus assumes "satisficing" rather than "optimising behaviour" as markets are in a constant state of disequilibrium (1982: 4). Consequently, Teece (1984) was early to acknowledge that such evolutionary ideas would help stimulate a theory of distinctive innovation based competencies.

Teece et al. (1997) view on distinctive processes is thus derived from Nelson and Winter's (1982) assumption that *routines* are the *genes* (building blocks) of organisations, which are nested in-between *individual skills* and *organisational capabilities*. Augier and Teece (2009: 415) note, "firms in this view also come with 'routines' or 'competencies,' which are recurrent patterns of action that may change through search and learning." Routines thus result from the iterative learning cycle of improvisation, experimentation and institutionalisation (Winter, 2003). Becker (2004) highlights although it is not explicit within Nelson and Winter (1982), this hierarchy is more apparent in Dosi et al. (2000: 5) who state: "In our view, clarity would be served by reserving the term 'skills' to the individual level and 'routines' to the organisational level." Dosi et al. (2000) argue a hierarchy exists where the skills of *individuals* offer the building blocks on which *groups* of individuals come to form collective routines, which in turn offer the building blocks of how *capabilities* emerge and solidify within organisations.

Nelson (1991: 67) notes evolutionary theory assumes that organisational adaptation differs depending on each firms: (1) strategy and (2) structure as well as (3) core capabilities. Thus, Nelson (1991: 67) argues strategic decision makers will interpret an industry environment differently when strategies and structures are "out of tune", (e.g. a technological leader strategy with an inefficient R&D department) which means changes in strategy often require ex-ante changes in structure (Nelson, 1991: 68). Core capabilities are then "what an organization can do well" and "has something of a life of [their] own." Thus, "higher-order"

routines involve Schumpeterian resource combinations, which coordinate "lower-order" routines that form a firm's operational capabilities (Nelson, 1991: 68). Evolutionary theory on routines has thus spawned research on organisational learning (Levitt and March, 1988; March, 1991), absorptive capacity (Cohen and Levinthal, 1990), combinative capabilities (Kogut and Zander, 1992) and the knowledge-based view (Grant, 1996) which all treat knowledge accumulation as a vital source of sustained performance.

Helfat and Peteraf (2009) explain Teece et al. (1997) dynamic capabilities framework also hinges on evolutionary theory's treatment of path dependence. The notion of path dependence recognises that "history matters" (Teece et al.. 1997). Augier and Teece (2009) note that firm capabilities define at least to some degree where a firm has been and what is has done. Where a firm can go is a function of its current asset position and the specific paths it needs to travel (Teece et al. 1997: 522). Therefore, this process often has an "imprinting" (Stinchcombe, 1965) effect in which events occurring at key development stages amount to replicated patterns of behaviour and long-term consequences. Szulanski (2003) explains "sticky" path-dependent knowledge endowments provide a point of differentiation between firms that enables the deployment of unique profit-seeking strategies. In other words, since tacit knowledge is deeply rooted in the history of the firm, the process of strategically leveraging this knowledge is a core source of sustained competitive advantage (Foss, 2002).

Vergne and Durand (2011: 370) explain path dependence translates into features (e.g. capabilities) which persist over time and appear hard to change due to technological (David, 1985), institutional (North, 1990), or cognitive (Maurer and Ebers, 2006) lock-ins. First mover advantages or superior products may not always succeed as "chance events" (Arthur, 1989) or "network externalities" (Katz and Shapiro, 1985) may lock-in inferior technologies (i.e. the QWERTY keyboard) due to switching costs imposed on consumers. Whilst these "externalities" may benefit market leaders in the short-run, rapid technological change often means, "consumer switching costs become quickly swamped by switching benefits" (Teece et al. 1997: 523). Overall, Augier and Teece (2009) argue that evolutionary theory's explanation of routines and path dependence shape the addressable opportunities faced by firms and are theoretical foundations in the dynamic capabilities perspective. Evolutionary theory is therefore paramount to this thesis as it underpins section 2.4 discussion on "asset orchestration" (Helfat et al. 2007), which is an emerging dynamic capabilities lens that examines strategic change in organisations.

2.2.2 Transaction Costs Theory

The transaction costs approach is widely accepted as a framework for helping to understand economic organisation (Augier and Teece, 2009). In Madhok's (2002) review, he argues the primary motivation of transactions costs theory is to explain *why* firms exist. In Ronald Coase's (1937) seminal contribution *The Nature of the Firm,* he identifies a paradox in neo-classical economics that "frictionless markets" do not explain the existence of firms. Instead, there are costs for "organising" production and the entrepreneur must consider the costs involved in each market transaction. Specifically, Coase's (1937) initial proposition was that firms and markets are alternative governance structures that differ in their transaction costs. Therefore, Coase argues firms exist under conditions when it is more economically efficient to replace markets and organise activities within the institution of the firm. These ideas influenced Oliver Williamson's *Markets and Hierarchies* (1975) and *The Economic Institutions of Capitalism* (1985), which consequently form the basis of transaction costs economics (TCE).

Like Coase, Williamson (1975) disputes frictionless markets and argues transaction costs exist due to sources of possible friction that may arise when using a market to link processes in the chain of production. Williamson (1975, 1985) therefore adds considerable precision to Coase's general argument by identifying the types of exchange, which conduct efficiently within firm boundaries rather than within the market. Thus, Williamson's basic view is that economic activity will be more efficient – transaction costs will be lower – when this activity occurs within a single organisation, or hierarchy, rather than through a market of several organisations. TCE is therefore a notable theory as it ontologically underpins explanations of international expansion (Buckley and Casson, 1976; Rugman, 1981; Hennart, 1982) cooperative strategy (Dyer and Singh, 1998) and vertical integration (Monteverde and Teece, 1982). Chapter 3 and 4 will thus review TCE in the context of internationalisation and cooperative strategy, as these are central research topics throughout this thesis.

Nevertheless, Augier and Teece emphasise that although dynamic capabilities "borrows from transaction costs" it borrows "less extensively than it does from the behavioral theory of the firm" (2009: 414). Instead, Augier and Teece (2009) argue that transaction costs limit the explanation of the "modern business firm" as innovation-based firms require superior organisational capabilities that are continuously reconfigured and improved. Transaction costs thus contribute but cannot solely explain the dynamic capabilities of the firm, since

rational decisions such as internalisation must involve co-specialisation, learning and the appropriately of profits from innovation (Augier and Teece, 2009: 414). However, Williamson's (1975) behavioural assumptions on (1) bounded rationality and (2) opportunism do inform dynamic capabilities in that (1) asset specificity, (2) uncertainty, and (3) frequency provide insight on cost reduction in high-technology markets. Specifically, Teece et al. (1997) argues that Williamson's (1975) assumption on asset specificity indicates that innovating firms must invest in specialised and co-specialised assets such as a dedicated manufacturing plant or a distribution system to avoid misappropriation when attempting to profit from an innovation. Therefore, TCE is an important theory as it helps explain how firms manage their internal (section 2.3, section 3.3) and external (section 4.3) asset position, which are both central to this thesis.

2.2.3 Resource Based Theory

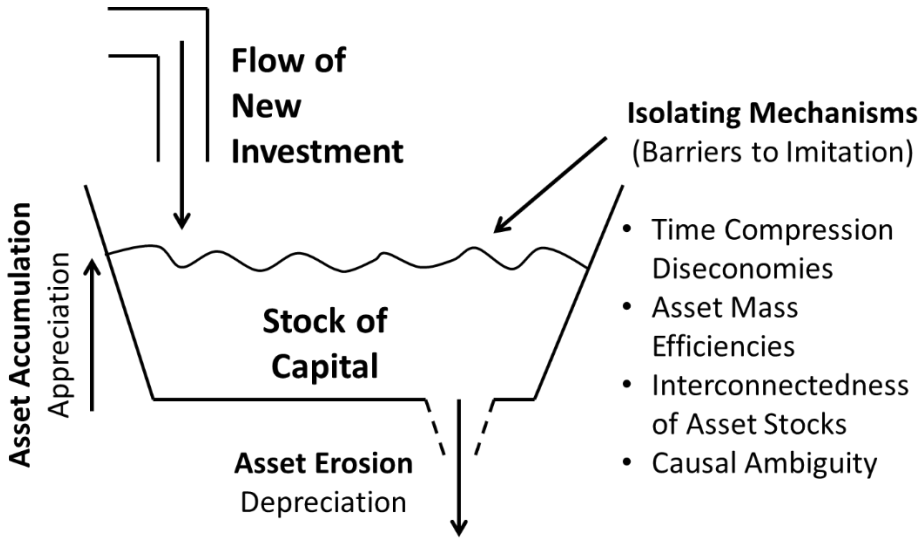
RBT is one of strategic management's most influential theories that aims to explain *why* firms are different (Barney et al. 2011). RBT is ontologically rooted in Edith Penrose's *The Theory of the Growth of the Firm* (1959) that positions firms as administrative entities based on their potentially valuable resources (McKelvie and Wiklund, 2010). Central to Penrose's (1959: 5) theory is the assumption that growth is an evolutionary process "where the experience of management will affect the productive services that all of its other resources are capable of rendering." In other words, "productive resources" are the "material" (plant, equipment, land, materials etc.) and "human" (labour, managerial, staff, engineers etc.) resources that provide the "subjective productive opportunities" to produce products and services, which can subsequently be consumed (Penrose, 1959). Therefore, the heterogeneous, path-dependent, and continuous combination of market and human resources to exploit productive opportunities is what theoretically drives the Penrosean growth of the firm (Kor and Mahoney, 2000).

Penrose's (1959) theory along with Lippman and Rumelt's (1982) assumptions on uncertain imitability led to what initially was termed as the resource based view (RBV) (Wernerfelt, 1984; Barney, 1986a, Dierickx and Cool, 1989, Barney, 1991). The RBV gained swift scholarly momentum due to the premise that researchers should examine a firm's internal resource base opposed to only the industry (e.g. Mason, 1957; Bain, 1968; Porter, 1980) or the firm's wider environment (e.g. Hannan and Freeman, 1977). However, within this literature, Barney's (1991) seminal study is what launched the RBV as a major strategic

management theory. Central to Barney's (1991) argument is that (1) resource heterogeneity – unique resources; and (2) resource immobility – low transferability – underpin sustained competitive advantage. Barney (1991) thus argues for a firm's resource base to sustain competitive advantage its capabilities must be (1) "valuable" in that it exploits an opportunity or neutralises a threat, is (2) "rare" in comparison to the competition, (3) costly to "imitate", and (4) and non "substitutable" where there are few alternatives to sustain competitive advantage.

However, Peteraf (1993) elaborates although resource heterogeneity is necessary for competitive advantage, this only provides temporary advantage, and resource immobility is the sufficient condition for non-imitation of valuable resources. Teece et al. (1997: 527) therefore distinguish dynamic capabilities from the RBV on the premise that Barney's (1986) original strategic factor market (SFM) logic explains the exchange of tradable resources, but is less clear on the examination of non-tradable resources such as technological, reputational, or institutional assets. Dierickx and Cool's (1989) assumptions on the "replicability" and "inimitability" of asset stock accumulation therefore ontologically underpins Teece et al. (1997) notion of asset positions. Central to Dierickx and Cool's (1989) argument is that idiosyncratic, firm-specific assets are "accumulated internally" over time and do not trade on open markets. Thus, these assets are built rather than bought and their sustainability depends on whether these "strategic asset stocks" are non-tradable, non-imitable and non-substitutable (1989: 1507). Lipmann and Rumelt's (1982) assumptions on non-imitability thus underpin Dierickx and Cool's (1989) argument that (1) time compression diseconomies; (2) asset mass efficiencies; (3) interconnectedness of asset stocks; (4) asset erosion; and (5) casual ambiguity isolate and impede rival imitation. **Figure 2:1** illustrates these "barriers to imitation":

Figure 2-1: Stocks and Flows of Asset Accumulation



Source: The Author's interpretation of Dierickx and Cool (1989)

Dierickx and Cool (1989: 1506) use the "bath-tub" metaphor to emphasise the stock and flow of R&D asset accumulation. The authors argue that R&D stocks (i.e. know-how) accumulate through flows of new investment (i.e. amount of R&D spending) but depreciate as an asset erodes over time, meaning that isolating mechanisms protect its value. For example, *time compression diseconomies* implies it is not possible to rush asset accumulation and the more a new entrant "tries to reduce the time horizon associated with asset accumulation, *ceteris paribus*, the more costly the process will be." (Lockett et al. 2009: 15). Whereas, Foss (1999) notes time compression diseconomies provide early-mover advantage and enable firms compete with would-be imitators. Moreover, *asset mass efficiencies* are the "economies of scale" of intangible assets (i.e. knowledge) in which a favourable initial asset position enhances further asset accumulation (Knott et al. 2003). Leiblien (2011) notes time compression diseconomies and asset mass efficiencies have clear conceptual overlaps with absorptive capacity (Cohen and Levinthal, 1990; Zahra and George, 2002) which represents the firm's ability to accumulate and exploit knowledge for commercial purposes. Consequently, Section 2.3.1 emphasises that Zahra and George (2002) reconceptualise absorptive capacity as a dynamic capability, which indicates Dierickx and Cool's (1989) isolating mechanisms are integral within the wider dynamic capabilities literature.

Causal ambiguity is an effective barrier to imitation when rivals do not understand an innovator's core competencies, which helps sustain competitive advantage (Reed and

DeFillippi, 1990). Since this knowledge is often tacit (Polanyi, 1967) and technologically intensive (Von Hippel, 1978) this means firms will often use secrecy to protect their valuable assets. Moreover, Reed and DeFillippi (1990: 90) argue that causal ambiguity "may be so great that not even managers within the firm understand the relationship between actions and outcomes." Thomke and Kuemmerle (2002) thus argue the *interconnectedness of asset stocks* is an additional mechanism on which innovating firms can combine various stocks of casually ambiguous knowledge to impede rival imitation. Teece's (1986) initial discussion on the development of asset complementarities therefore links to the interconnectedness of asset stocks and especially those assets are casually ambiguous, as they provide pioneering firms with greater opportunity to profit from their own innovations. Inimitability therefore underpins the asset accumulation process and are paramount resource based assumptions within the dynamic capabilities framework (Teece et al. 1997). Section 2.4 emphasises that asset accumulation is a central in the "asset orchestration" process, and is an important assumption in the examination of *how* firms engage in strategic change.

2.3 The Dynamic Capabilities Debate

Section 2.2 highlights there is widespread debate within the dynamic capabilities literature (e.g. Teece et al. 1997; Eisenhardt and Martin, 2000; Zollo and Winter, 2002), but focusses on the theoretical foundations that unify these contributions. In this section, the prime objective is to examine the seminal dynamic capabilities articles that contribute to the debate on this emerging theoretical lens. Table 2-2 thus presents what Barreto (2010) identifies as the seminal contributions within this literature. Moreover, Table 2-3 examines these various perspectives, which supports the aim to establish a dynamic capabilities lens that will direct this study.

Table 2-2: Main Definitions of Dynamic Capabilities

Study	Definition
Teece & Pisano (1994)	"The subset of the competences and capabilities that allow the firm to create new products and processes and respond to changing market circumstances." (1994: 541)
Teece et al. (1997)	"The firm's ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments." (1997: 509)
Eisenhardt and Martin (2000)	"The firm's processes that use resources – specifically the processes to integrate, reconfigure, gain and release resources – to match and even create market change. Dynamic capabilities thus are the organizational and strategic routines by which firm's achieve new resource configurations as markets emerge, collide, split, evolve and die." (2000: 1107)
Teece (2000)	"The ability to sense and then seize opportunities quickly and proficiently." (2000: 47)
Zollo and Winter (2002)	"A learned and stable pattern of collective activity through which the organization systematically generates and modifies its operating routines in pursuit of improved effectiveness." (2002: 340)
Winter (2003)	"Those (capabilities) that operate to extend, modify, or create ordinary capabilities." (2003: 991)
Zahra et al. (2006)	"The abilities to reconfigure a firm's resources and routines in the manner envisioned and deemed appropriate by its principal decision makers(s)." (2006: 918)
Teece (2007)	"Dynamic capabilities can be disaggregated into the capacity (a) to sense and shape opportunities and threats, (b) to maintain competitiveness through enhancing, combining, protecting, and, when necessary, reconfiguring the business enterprise's intangible and tangible assets." (2007: 1319)
Helfat et al. (2007)	"A dynamic capability is the capacity of an organisation to purposefully create, extend, or modify its resource base." (2007: 4)

Source: Barreto (2010: 260)

2.3.1 Dynamic Capabilities and Competitive Advantage

Ambrosini and Bowman (2009) review the dynamic capabilities literature and argue that Teece and Pisano (1994) were the first scholars to introduce the dynamic capabilities perspective. In this study, Teece and Pisano (1994) argue firms that are able to adapt their internal and external competencies to the challenges of rapid technological change, are those that exhibit dynamic capabilities. Consequently, the authors argue that the core purpose of dynamic capabilities are to sustain competitive advantage[1] (1994: 537). Teece et al. (1997) therefore extend Teece and Pisano's (1994) initial contribution through the argument that sustained competitive advantage of firms stems from dynamic capabilities, which are rooted

[1] There is wide debate in strategic management on defining competitive advantage. For parsimony, this study follows Peteraf and Barney's extensive review in which they define 'competitive advantage' as the firm's ability to "create more economic value than marginal (breakeven) competitors in its product market." Economic value is the "difference between the perceived benefits gained by the purchasers of a good and the economic cost to the enterprise." Value creation is therefore the difference between perceived benefits (i.e. willingness to pay) and the economic costs of producing a good/ service (2003: 316).

in high performance routines that operate inside the firm, which influence new paths and positions. Sustained competitive advantage therefore has little to do with Porter's (1985) discussion on calendar time (i.e. industry cycles), but on Lippman and Rumelt's (1982) discussion on the firm's ability to isolate competitive duplication. Teece and colleagues (Teece and Pisano, 1994; Teece et al. 1997, Teece, 2000; Teece, 2007) therefore maintain that dynamic capabilities are idiosyncratic to each firm, and strategy formation is a long-term capability development process.

In contrast, Eisenhardt and Martin (2000) examine Teece et al. (1997) initial arguments and contend that although some aspects of dynamic capabilities are idiosyncratic in detail, other aspects of dynamic capabilities exhibit commonalities, which are comparable across firms. Specifically, the authors argue that dynamic capabilities consist of several strategic and organisational processes such as NPD, and alliances, which are repeatable across firms (2000: 1106). Strategy formation therefore relies on learning mechanisms such as exploring best practices, learning from mistakes, crises, knowledge codification, and paced experience (i.e. absorptive capacity), which shape an organisations unique path. Subsequently, the authors argue dynamic capabilities result in the creation of new "fungible" resources, which they define as the "extent to which capabilities are applied for an alternative use at a lower cost" (2000: 1100). However, Eisenhardt and Martin (2000) argue that dynamic capabilities are "equifinal" (i.e. multiple paths lead to similar destinations) and "substitutable" that suggests dynamic capabilities are more replicable than Teece et al. (1997) would argue. However, Eisenhardt and Martin (2000) also argue that dynamic capabilities evolve through strategic thinking that is intuitive and reliant on informal rules (i.e. heuristics) rather than rational decision making based on deductive reasoning (2000: 1112).

Furthermore, Eisenhardt and Martin argue dynamic capabilities are more pertinent in high-velocity markets (e.g. Eisenhardt, 1989) in which market boundaries are blurred, successful business models are unclear and market players are ambiguous and shifting (2000: 1111). In D'Aveni's (1994) terms, these markets encounter hypercompetition in which the rules or norms of an industry are continuously shifting due to revolutionary forms of change, which make it almost impossible for a firm to sustain a dominant position. Eisenhardt and Martin (2000) therefore argue that Teece et al. (1997) perspective explains how temporary advantage is maintained in moderately dynamic markets, but is ineffective in capturing how firms achieve long-term advantage in high-velocity markets. Given this volatility, the authors argue that "simple routines" underpin "effective dynamic capabilities" which help

firms focus on strategic issues without being locked into specific behaviours or past experiences that are no longer relevant for the emerging industry context (2000: 111). Instead, the authors argue the core purpose of dynamic capabilities is to maintain temporary competitive advantage and it is how the firm uses them "sooner, more astutely, or more fortuitously than the competition to create resource configurations that have that advantage" (Eisenhardt and Martin, 2000: 1117)

Table 2-3: The Dynamic Capabilities Debate

	Teece et al. (1997)	Eisenhardt and Martin (2000)	Zollo and Winter (2002)	Winter (2003)	Zahra et al. (2006)	Teece (2007)	Helfat et al. (2007)
PURPOSE	•Sustained competitive advantage	•Temporary competitive advantage	•Improved effectiveness	•Reconfigure operational capabilities	•Reconfigure substantive capabilities	•Sustained competitive advantage	•Strategic change
STRATEGY PROCESS							
Strategic thinking	•Rational •Idiosyncratic	•Intuitive •Emergent	•Rational •Deliberate	•Rational •Deliberate	•Rational •Emergent	•Intuitive •Asset orchestration	•Intuitive/rational •Asset orchestration
Strategy formation	•Previous paths •Asset position •Processes	•Equifinal paths •Fungible assets •Best practices	•Codification •Articulation •Experience	•Dynamic routines •Operating routines	•Dynamic capabilities •Substantive capabilities	•Sensing •Seizing •Transforming	•Create •Extend •Modify
Strategic change	•Radical •Fast pace •Revolution	•Radical •Fast pace •Revolution	•Moderate •Gradual pace •Evolutionary	•Moderate •Gradual pace •Evolutionary	•Radical/Moderate •Fast/Gradual •Evolutionary	•Radical •Fast pace •Revolutionary	•Radical/Moderate •Fast/Gradual •Revolutionary/ Evolutionary
STRATEGY CONTENT							
Result of strategic activities	•New asset position •New paths	•New fungible resources •Equifinal paths	•Modify operating routines	•Modify operating routines	•Modify substantive capabilities •Indirect superior performance	•Coordination •Integration •Learning •Reconfiguration	•Technical fitness •Evolutionary fitness
STRATEGY CONTEXT							
Industry context	•Hyper-competition	•Hyper-competition	•Continuous improvement	•Continuous improvement	•Hyper-competition	•Hyper-competition	•Multiple industry contexts

Source: The Author

2.3.2 Dynamic Capabilities and Resource Reconfiguration

Zollo and Winter (2002) contribute to this debate by using evolutionary (Nelson and Winter, 1982) and organisational learning (Levitt and March, 1988) theory to investigate the mechanisms on which firms develop dynamic capabilities. Zollo and Winter's (2002: 340) perspective also differs from the abovementioned, as they argue the core purpose of dynamic capabilities is to pursue "improved effectiveness" rather than sustain competitive advantage. Consequently, the authors argue that the process of dynamic capability development is gradual and emerges through routine based forms of learning. Levitt and March (1988: 320) thus define organisational learning as "organizations [that] are seen as learning by encoding inferences from history into routines that guide behaviour." Therefore, the authors argue (1) experience accumulation, (2) knowledge articulation, and (3) knowledge codification, represent the learning mechanisms that help firms continuously improve its resource base. Zollo and Winter (2002) also argue the major output of building dynamic capabilities is that firms are able to configure their "existing" operating routines. This perspective therefore takes a more evolutionary approach to strategic change in comparison to the above perspectives that assume dynamic capabilities play a "revolutionary" role in a firm's development (Barreto, 2010).

Zollo and Winter's (2002) perspective is also distinct from the above as their discussion on learning mechanisms indicates that strategy process is rational and deliberate, as opposed to what Eisenhardt and Martin (2000) would argue as being intuitive and emergent. For example, the authors emphasise that experience accumulation is a learning mechanism on which firms accumulate tacit knowledge from their previous experience (Kogut and Zander, 1992). This experiential knowledge then provides the know-how to continuously improve and gradual reconfigure a firm's existing operating routines. Zollo and Winter (2002) therefore argue dynamic capabilities are manifest in deliberate learning (i.e. knowledge articulation and codification) mechanisms that transform tacit knowledge into codified knowledge. Articulation routines thus include the sharing of ideas and discussion on change, while codification routines involve deliberate efforts to produce artefacts such as strategic partnering manuals and environmental scanning procedures to disseminate this articulated knowledge. Central to this view, is that firms build dynamic capabilities from previous experience of operational change, and use this knowledge to implement further resource

improvements (Zollo and Winter, 2002). Zollo and Winter (2002) is therefore a broader perspective as it assumes that firms can build dynamic capabilities in industry contexts where the pace of change is more gradual and magnitude of change is more moderate.

Winter (2003) extends this debate and argues that these learning mechanisms lead to the creation of higher-order routines (dynamic capability) which support the regular modification of lower-order operating routines (operational capability). In this study, the author refers to Collis's (1994) "capability hierarchy" principal in which operational (zero-level), dynamic (first-order), and meta (second-order) capabilities link to one another. Easterby-Smith and Prieto (2008: 237) also build on Winter (2003) and state: "Operational capabilities or routines are geared towards the functioning of the organization; dynamic capabilities are dedicated to the modification of operational routines; finally, learning capabilities facilitate the creation and modification of dynamic capabilities." Second-order learning processes (Adler and Clark, 1991) therefore underpin meta-capabilities, which scholars describe as the "learning-to-learn type" of capability (Danneels, 2002; 2008). Recently, Ambrosini et al. (2009) advance Winter's (2003) conceptual ideas by using Senge's (1990) theory of generative (second-order) learning to propose a "regenerative dynamic capability" that modifies a firms dynamic capabilities (first-order), which in turn modifies a firms operational (zero-level) resource base.

Zahra et al. (2006) however note that these perspectives are less clear on how dynamic capabilities "develop, emerge, or evolve" in new and established organisations. The authors therefore argue for the creation and subsequent use of dynamic capabilities correspond to an actor's (e.g. individual, team, or senior management) *perception* of opportunities to change existing routines or resource configurations, their *willingness* to undertake such change, and their *ability* to implement these changes. The authors therefore criticise early views that dynamic capabilities represent sustained advantage (Teece et al. 1997) or strategic processes such as NPD that enable long-term advantage (Eisenhardt and Martin, 2000). Instead, Zahra et al. (2006) build on Winter's (2003) discussion and distinguish "substantive capabilities" (i.e. ordinary capabilities) from dynamic capabilities, which they define as the ability to change substantive capabilities. Central to their argument is substantive capabilities solve problems such as NPD, whereas dynamic capabilities "reform" the way it performs tasks such as the development of new products. This perspective thus differs from Eisenhardt and Martin (2000), as the authors argue that routines such as NPD represent a substantive

capability, but the ability to change existing NPD routines is what constitutes a dynamic capability (2006: 951).

Zahra et al. (2006) therefore argue the core purpose of a dynamic capability is to reconfigure substantive capabilities and they distinguish this higher-order capability from its effects on potential outcomes such as increased costs, survival, and growth. The authors thus propose that dynamic capabilities mediate the relationship between a firm's substantive capabilities and its organisational knowledge, which mean dynamic capabilities have an indirect impact on performance (2006: 943). In other words, the authors emphasise a dynamic capability is one way to implement change, but firms require bundles of capabilities (substantive and dynamic) and knowledge to achieve the outcome of superior performance. Moreover, Nelson and Winter's (1982) original arguments on "maladaptation" (i.e. the harmful side of change), reminds scholars that dynamic capabilities are only one aspect of strategic management, and do not necessarily underpin sustained competitive advantage. Thus, Zahra et al. (2006) distinction between dynamic capabilities in new and established firms, seeks to strike a balance that suggests capability development is one that is both intuitive as it is rational, and emergent as it is deliberate. Nevertheless, what unifies all of these perspectives is that resource reconfiguration is central to the overall purpose and nature of dynamic capability development.

2.3.3 Dynamic Capabilities and Asset Orchestration

Teece (2012: 1395) notes the role of individual executives and entrepreneurs is now beginning to form an important part of the dynamic capabilities debate. That is some researchers argue that the previous dynamic capability perspectives focus too heavily on Nelson and Winter's (1982) notion of organisational routines, but allocate less attention to the individual skills, knowledge and actions of executives and entrepreneurs (Adner and Helfat, 2003; Teece, 2007; Helfat et al. 2007, Augier and Teece, 2009). Moreover, Teece (2007) argues that the previous perspectives do not explicate on the nature and "microfoundations" of dynamic capability development. Over the past decade, an increasing number of scholars have been calling for research on the microfoundations of strategic management, which Foss (2011: 1414) defines as "the foundations that are rooted in individual action and interaction." Teece and colleagues (Teece, 2000, 2007; Helfat et al. 2007; Augier and Teece, 2009) therefore argue that the "asset orchestration" process is an emerging but central function within the dynamic capabilities paradigm.

However in the dynamic capabilities literature, it seems researchers have yet to clearly define "asset orchestration" but some studies do elaborate on the processes that underpin this managerial function (Teece, 2007; Helfat et al. 2007; Augier and Teece, 2009; Sirmon et al. 2011). Teece's (2007: 1319) definition in Table 2-2 indicates that a firm's dynamic capabilities fall into three clusters of activities: (1) the identification and assessment of an opportunity (i.e. *sensing*); (2) the mobilisation of resources to create value from an opportunity (i.e. *seizing*); (3) and the continuous realignment of resources to address new opportunities (i.e. *transforming*). Consequently, Teece argues that initial research on – coordination, integration, learning, and reconfiguration (i.e. Teece and Pisano, 1994; Teece et al. 1997) – are actually sub-processes that support sensing, seizing, and transforming. Therefore, Teece argues that the combination of these processes and sub-processes encapsulate the asset orchestration process (2007: 1341).

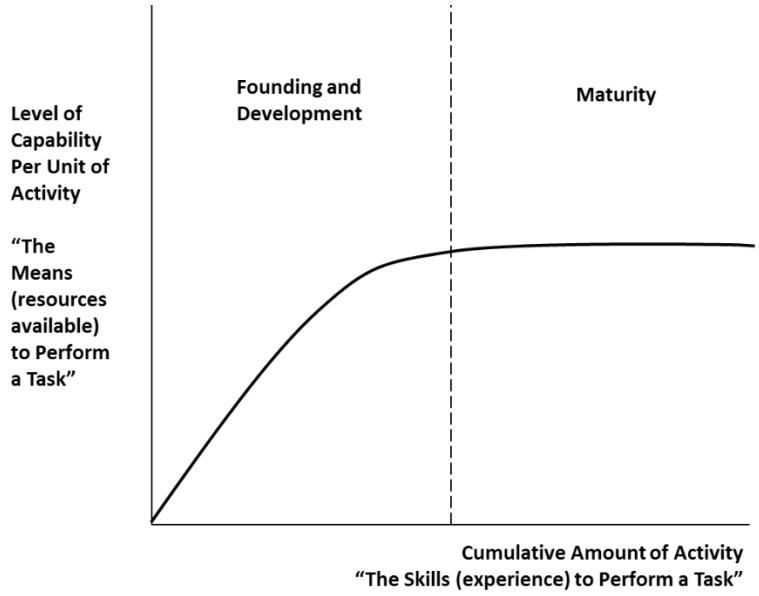
In response to this research, Helfat, Finkelstein, Mitchell, Peteraf, Singh, Teece, and Winter collaborate on *Dynamic Capabilities: Understanding Strategic Change in Organisations* (2007) to examine the asset orchestration process. Specifically, Helfat et al. (2007: 25) argue that asset orchestration is a "managerial activity [that] involves, inter alia, orchestrating complementary and co-specialized assets, inventing and implementing new business models, and making astute investment choices (including with regard to R&D and M&A) in situations of uncertainty and ambiguity." The authors therefore emphasise that asset orchestration differs from previous dynamic capability perspectives, as it not only *protects* asset value (i.e. Lippman and Rumlet, 1982) but also *creates* asset value through Schumpeterian resource combinations (2007: 28). Therefore, asset orchestration not only involves the choice of governance modes, it involves a strategic manger's resource allocation skills to design and implement governance structures that *protect* and *create* long-term investment priorities (Maritan and Peteraf, 2007). Therefore, Teece argues that asset orchestration is inherently entrepreneurial, as it exhibits few routines, as most "transformations require actions that one may never replicate" (2012: 1397).

Helfat et al (2007) therefore redefine dynamic capability by synthesising the previous perspectives listed in Table 2-3 in relation to the asset orchestration process. Helfat et al. (2007: 4) argue:

> A **dynamic capability** is the *capacity* of an organization to *purposefully create*, *extend*, or *modify* its *resource base*.

Helfat et al. (2007: 4) argue that the words in italics have specific meanings but recognise a single phrase cannot include everything of theoretical importance. Firstly, the "resource base" includes "tangible, intangible, and human assets (or resources) as well as capabilities which the organization owns, controls, or has access to on a preferential basis" (2007: 4). The term "preferential basis" thus implies organisations' need not own a resource or capability for it to comprise part of the resource base such as preferential access to co-specialised assets (2007: 4). Secondly, the authors define "capacity" as "the *ability* to perform a task in at least a minimally acceptable manner." (2007: 5). Consistent with the *Oxford English Dictionary*, the word *ability* is "the possession of the *means* or *skill* to do something." Figure 2-2 thus illustrates "resources" and "experience" underpin the "capacity' concept." Thus, resources provide the "means" to perform a change activity, while experience concerns the degree of "skills" an organisation has to implement a change activity (Helfat and Peteraf, 2003).

Figure 2-2: The Capacity Dimensions to Perform a Task



Source: Adapted from Helfat and Peteraf (2003)

Thirdly, the authors note that "purposeful" suggests dynamic capabilities reflect some degree of deliberate intent (2007: 5). Helfat and Peteraf (2009: 95) therefore argue a "minimal degree of intentionality distinguishes a capability (dynamic or otherwise) from an accident or pure luck." Moreover, the authors adopt Winter and colleagues (Dosi et al. 2000; Zollo and Winter, 2002; Winter, 2003) view that the term "purposeful" distinguishes dynamic from operational capabilities in that the latter organisational processes lack strategic intent.

However, the authors also argue that dynamic capabilities are also likely to exhibit emergent streams of activity (i.e. Eisenhardt and Martin, 2000) where there is clear intent (e.g. alliances or acquisitions), but uncertainty on how to achieve an aim due to issues such causal ambiguity (Barney, 1991) and environmental turbulence (D'Avenni, 1994). Helfat et al (2007) therefore adopt a similar standpoint to that of Zahra et al. (2006) in which they argue that dynamic capability development is both intentional and emergent.

Finally, the words "create, extend or modify" encapsulate "asset orchestration" that signifies the *process* with which firms alter their resource base (2007: 5-6). Helfat et al. (2007) therefore argue asset orchestration consists of organisational and managerial processes that primarily involve (1) search and selection activities and (2) configuration and deployment activities. In line with Pettigrew (1992), the authors argue search and selection activities involve strategic decisions such as the creation of co-specialised assets or investment in R&D. Whereas, configuration and deployment activities focus on implementation such as the management of co-specialised assets or cultivation of innovation processes (2007: 28). Helfat et al. (2007) thus note asset orchestration is the overarching strategic process that underpins dynamic capability development. Helfat et al. (2007) perspective is similar to Winter (2003) and Zahra et al. (2006) as they argue the core purpose of a dynamic capability is to implement strategic change, which they define as change that influences the long-term direction of the organisation.

Based on Table 2-3 examination, the author argues that Helfat et al. (2007) perspective on asset orchestration provides a theoretical lens with the most magnification (i.e. focal length) and clarity (i.e. aperture) to examine the development and deployment of dynamic capabilities. That is the author adopts the view that the core purpose of a dynamic capability is to reconfigure the resource base (e.g. Zahra et al. 2006) rather than sustain competitive advantage (e.g. Teece, 2007), which increases the conceptual appeal of Helfat et al.(2007) lens. The following section will therefore adopt a process perspective to facilitate this wider aim of exploring *how* international new ventures build dynamic capabilities in networking to achieve outputs congruent with survival and growth.

2.4 A Process Lens on Dynamic Capability Development and Deployment

The prime objective of this section is to establish a process lens that enables the exploration of dynamic capability development and deployment. This section will therefore build on section 2.3 discussion that asset orchestration is a valuable theoretical lens to explore

dynamic capability development. Interestingly, Maritan and Peteraf (2007) note that few contributions conduct granular research on the organisational and managerial processes that underpin dynamic capability development. This section therefore applies a process lens to examine the creation, extension, and modification of a firm's resource base (Helfat et al. 2007). Moreover, the (1) search and selection, and (2) configuration and deployment activities provide a useful platform to conduct granular research. Sirmon e al (2011) also propose that their "resource management framework" (Sirmon et al. 2007) also takes a process perspective on *how* organisations manage their resource base and overlaps with Helfat et al. (2007) asset orchestration framework. The following sections will therefore examine the resource creation, extension, and modification processes to clarify the mechanisms on which this theoretical lens operates.

2.4.1 Resource Creation Process

Helfat et al. (2007: 6) note the word "create" include "all forms of resource creation in an organization including obtaining new resources through acquisitions and alliances, as well as through innovation and entrepreneurial activity." The authors note the creation of *new* resources therefore involves the search and selection of existing resources that are available within the wider external environment. For example, the authors state the creation of resources through acquisitions fundamentally involves the search and selection of acquisition candidates, while resource creation for NPD involves the search and selection of new products (2007: 6). Nevertheless, despite this brief description, Helfat et al. (2007) do not elaborate on the search and selection activities that underpin the resource creation process. Teece (2007) in contrast identifies "sensing" and "seizing" opportunities as central processes that result in the emergence of dynamic capabilities. Therefore, Teece's (2007) discussion on sensing aligns closely with Helfat et al. (2007) notion of resource creation as both processes consider how firms *search* for opportunities.

Search is an "exploration" process that underpins an important aspect of organisational learning theory (March, 1991). Rooted in March and Simon (1958), problemistic search seeks to explain *how* organisations search for new information in order to solve existing problems. Teece (2007: 1326) notes search includes processes that direct R&D, taps supplier and "complementor" innovation, and identifies changing customer needs. In this literature, search processes are normally "local" as organisational members search for alternatives within their "neighbourhood" as information does not span technological or organisational

boundaries (Levinthal, 1997). Rosenkopf and Nerkar (2001) label these search processes as "local exploration" while Henderson and Clark (1990) argue these processes result in the exploitation of incremental innovation. By contrast, "global" search involves the exploitation of "path-breaking" opportunities (Levinthal, 1997) and radical innovation (Henderson and Clark, 1990; Henderson and Clark, 1994). Rosenkopf and Nerkar (2001) thus note this learning process involves "radical exploration" where organisational members search for new opportunities that span technological and organisational boundaries. Dynamic capabilities therefore encapsulate both of these search activities (local and global), which allows firms to *create* new resources in response to technological and market opportunities (Teece, 2007: 1322).

Although Helfat et al. (2007) argue resource creation is an entrepreneurial activity the authors give scant attention to the nature of opportunity. Whereas in the entrepreneurship literature, there is wide debate on whether opportunities are waiting to be "discovered" or "created" by entrepreneurs (Stevenson and Jarillo, 1990; Venkataraman, 1997; Alvarez and Barney, 2007). Short et al. (2010) review the opportunity concept and find that entrepreneurship research leans more towards the process of discovery, opposed to the creation of opportunities. Nevertheless, recent research views opportunity discovery and creation as important processes in the advancement of RBT (Barney et al. 2011). That is Alvarez and Barney (2007: 13) argue discovery theory suggests opportunities are "exogenous" as they exist independently of entrepreneurial perceptions and actions and are "waiting to be discovered and exploited." Whereas, in creation theory, opportunities are not objective phenomena formed by exogenous market imperfections, but "created endogenously, by the actions, reactions, and enactment of entrepreneurs exploring ways to produce new products or services" (2007: 15).

Alvarez and Barney (2007: 13) thus argue the exogenous nature of opportunity discovery means this theory is predominately about search, and the term "search" has little meaning in creation theory, as entrepreneurs do not "search" as they are unaware of what they are looking for. However, Sarasvathy (2001) notes that creation theory places greater emphasis on the Schumpeterian qualities of the entrepreneur. Relatedly, Bingham et al. (2007) argues entrepreneurs create opportunities through intuition (i.e. heuristics) and adaptation, which indicates that creation theory and search share a distinctive behavioural heritage. Zahra (2008) therefore challenges Alvarez and Barney's (2007) assumption and argues that search creates a virtuous and dynamic cycle in which entrepreneurs discover and subsequently

create opportunities. Thus, Zahra (2008: 253) argues opportunity creation involves search in Schumpeterian environments where industry knowledge is young, technology is emergent, and the firm has a specialised strategic focus, which are all important settings within dynamic capabilities research.

Helfat et al. (2007: 53) identify "selection" as a central aspect of the decision-making process, and argue that selection involves "investment" in opportunities. In strategic management, a stream of studies have begun to examine a firm's "investment" in "strategic opportunities" (Makadok and Barney, 2001; Denrell et al. 2003; Coen and Maritan, 2011). Denrell et al. (2003) for example discuss the investment in strategic opportunities in which firms buy commodity resources (i.e. information) in factor markets and intentionally transform these tradable resources into non-tradable "complex" resources. Under this view, commodity resources are "discovered" and bought in factor markets, while complex resources are "created" internally and built over time. Sirmon et al. (2007: 278) also discuss the resource creation process, but under the label of "structuring" resource portfolios which involves sub-processes of (1) acquiring (2) accumulating and (3) divesting resources. Sirmon et al. (2011) identifies their notion of "acquiring" and "accumulating" overlaps with "buying" and "building" while divesting is a processes that links with section 2.3.3 discussion on resource modification. These investment processes thus signify a virtuous cycle of "buying [discovery] and building [creation]" since firms "buy resources in SFMs, builds them further through internal development, and then uses those resources to shape further SFM transactions" (Maritan and Peteraf, 2011: 1383).

Finally, "configuration" and "deployment" are important steps in the asset orchestration process (Sirmon and Hitt, 2009). Although Helfat et al. (2007: 8) argue "configuration" and "deployment" result in strategic change they do not discuss the implementation processes that lead to resource creation, extension, or modification. Sirmon and colleagues (Sirmon et al. 2007; Sirmon and Hitt, 2009; Sirmon et al. 2011) on the other hand provide a rich discussion on configuration and deployment within their resource management framework. Sirmon et al. (2007) emphasise firms must initially "design" capability configurations before they are able to use such configurations to implement strategy. Sirmon et al. (2011: 1392) label this strategic behaviour as "leveraging" that involves "a sequence of processes to exploit the firm's capabilities and take advantage of specific market opportunities." Specifically, these leveraging processes consist of (1) mobilizing, which provides a plan or vision for identifying requisite capabilities to design new capability configurations; (2)

coordinating, which involves integrating capabilities into efficient and effective configurations, and (3) deploying, which exploits a capability configuration for the implementation of strategy (Sirmon et al. 2007: 277).

Teece's (2007) discussion on "seizing" opportunities is one example that sheds light on new capability configurations. The author argues that seizing opportunities involves the creation of an innovative business model that defines a firms commercialisation strategy and investment priorities. Therefore, the author argues firms must make "design choices" (i.e. Chesbrough and Rosenbloom, 2002) on the architecture of their business model, opposed to the mere selection of a physical technology. Thus, having an entrepreneurial vision that "shapes" an industry architecture (i.e. the business ecosystem) and having skills to coordinate co-specialised assets are vital for successful deployment of new capability configurations (Teece, 2007: 1330). Overall, the variation in a firm's ability to make capability configurations influence the extent to which firms can successfully create heterogeneous resource positions (Maritan and Peteraf, 2011). Given this limited literature on resource creation, it is evident this is an area ripe for further research.

2.4.2 Resource Extension Process

Helfat et al. (2007: 6) note the word "extend" means when "organisations 'extend' their resource base in the direction of more of the same, as for example when they seek to promote growth in an ongoing business." Therefore, the authors note that "extension of the current resource base also requires an important selection decision regarding whether or not to enhance current assets and capabilities, and which ones to enhance" (2007: 6). Coen and Maritan (2011) therefore argue that "investment" in existing assets reinforces the resource extension process. Thus, the choice to increase investment in an "existing asset" is largely dependent on the acquisition of new knowledge, as this new knowledge helps firms make decisions on whether increased investment in existing assets will continue to yield competitive advantage and sustained profitable growth (Makadok and Barney, 2001). Denrell et al. (2003) discussion on the "search" for new knowledge therefore infers that search is also an important activity in the resource extension process.

On first glance, Helfat et al. (2007) notion of "resource extension" is similar to the entrepreneurial process of "opportunity creation" as it involves "building" new opportunities (Zahra, 2008). However, the core distinction in "resource extension" is this process focusses on increased investment in "existing" opportunities, opposed to the investment in 'new'

opportunities (Denrell et al. 2003). Despite this discussion, few dynamic capabilities studies discuss the "resource extension" process and ones that do (e.g. Winter, 2003; Helfat et al. 2007) provide scant detail on what resource extension actually entails. However, Karim and Mitchell (2000) is one exception within the dynamic capabilities literature that examines resource extension. In this study, the authors focus on acquisitive growth and find that "resource deepening" processes lead to path-dependent change, while "resource extension" processes leads to path-breaking change. Specifically, the authors find that acquirers will sustain growth when they extend investment in a "target firms" core competencies, which are distinct from their previous resource base (2000: 1068). Karim and Mitchell (2000) therefore reinforce the argument that innovation based firms must reallocate and extend investment in core competencies if they are to sustain long-term competitive advantage.

Resource extension is also similar to the evolutionary concept of "retention" which is the mechanism on which firms preserve, duplicate, or propagate positively "selected" forms (Zott, 2003). Interestingly, Levinthal (1995) identifies a paradox, as the notion of "retention" in the evolutionary theory is at cross-roads with RBT, as the latter does not focus on the "retention" of firm-specific capabilities, but on the "uniqueness" of capabilities. Thus, in evolutionary theory, "uniqueness" poses the risk of extinction if there are no repeatable processes, while in RBT, too much repetition risks imitation. Ironically, Penrose (1959) is one of the few resource-based scholars to include the evolutionary concept of "retention" but warns that rapid investment may endanger a firm's distinctive competencies. For example, if as Barney (1986b) suggests, that organisational culture is a valuable resource, then rapid investment in new human resource could threaten the integrity of the culture and thereby diminish a firm's overall advantage (Dierickx and Cool, 1989). Garnsey (1998) thus argues since early growth can be as much as a threat as an opportunity, firms must invest wisely in distinctive resources they wish to retain and extend.

Sirmon and colleagues (Sirmon et al. 2007; Sirmon et al. 2011) discuss investment, but assign different labels to resource extension process. Sirmon et al. (2007: 277) like other scholars (e.g. Dierickx and Cool, 1989; Thomke and Kuemmerle, 2002) discuss "accumulating" as "a process of developing resources internally" which overlaps with resource extension. Thus, the authors note internal development of resources enhances isolating mechanisms, decreases imitation threats, and increases maintainability of advantage (2007: 279). Similarly, Sirmon et al. (2007) discussion on the "enriching" process, which belongs to the "bundling" component of their resource management framework,

provides insight into how firms invest in existing capabilities. That is, the authors define enriching as "learning new skills that extend the repertoire of current skills or by adding a complementary resource from the resource portfolio to the current bundle." (2007: 277). Therefore, the "key goal of an enriching bundling process is to 'extend' and elaborate a current capability" to maintain the worth of valuable assets (2007: 281). Resource extension is therefore a long-term investment process, and important within the asset orchestration function (Helfat et al. 2007; Maritan and Peteraf, 2011).

2.4.3 Resource Modification Process

Helfat et al. (2007: 6) note the word "modify" means "organisations can 'modify' their resource base in order to change their businesses, including in response to change in the external environment." The authors argue:

'In addition, modification of a resource base requires search for and selection of any such modifications. As part of resource modification, a firm may choose to destroy part of its existing resource base by selling, closing, or discarding it. Dynamic capabilities apply to exit, not just expansion' (Helfat et al. 2007: 6).

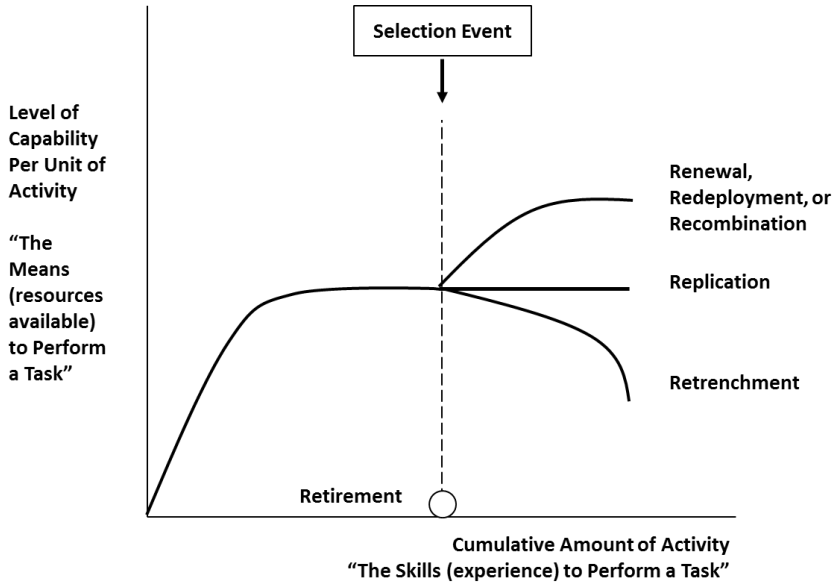
Although the previous section explains that firms should extend investment in distinctive resources, the resource modification process suggests core capabilities also have a "dark side" (Schreyögg and Kliesch-Eberl, 2007: 916). In Leonard-Barton's (1992: 118) words core capabilities run the risk of becoming "core rigidities" which are "deeply embedded knowledge sets [that] actively create problems" and hamper a firm's competitive advantage. Whereas, in Hannan and Freeman's (1984) terms, this rigidity issue involves "structural inertia" where organisations fail to adapt at the rate business environments change. Levinthal and March (1993) note this is common when an organisation's learning falls into a "competency trap" as it struggles to balance excessive exploration (the failure trap) or excessive exploitation (the success trap). Thus, in high-velocity markets, organisational capabilities may "easily invert from a strategic asset into a strategic burden" (Schreyögg and Kliesch-Eberl, 2007: 916).

Helfat and Peteraf (2003) thus identify several processes that trigger the resource modification process. In this study, the authors argue that "selection events" may "branch" the evolution of capabilities in several directions (2003: 1004). Consequently, the authors argue that: (1) retirement, (2), retrenchment, (3) renewal, (4) replication, (5) redeployment, and (6) recombination are the underlying processes of capability transformation. These

branches therefore provide researchers with a framework to investigate what Helfat et al. (2007) refer to as the resource modification process. Figure 2-6 illustrates these modification processes.

Helfat and Peteraf (2003) describe "retirement" as a modification process when firms abandon an existing capability, such as when trade embargos eradicate the demand or supply of a particular product or service. Similarly, the authors describe "retrenchment" as a process where firms gradually phase out a capability due to decreasing demand (2003: 1005-1006). Consequently, Teece (2007: 1333) argues firms need dynamic capabilities to "destroy part of its existing resource base by selling, closing, [or] discarding it." Whereas, Sirmon et al. (2007) discussion on the "divesting" process, which forms part of the "structuring" process, provides insight into how firms shed resources. The authors argue that since firms have finite resources, it is imperative they evaluate their current resource base and divest less-valued resources to generate the capacity to accumulate resources of a higher-value (2007: 280). Therefore, divestment is a strategic task to help managers free up the capacity to create and extend resources (Hitt et al. 2011).

Figure 2-3: Branches of the Capability Lifecycle



Source: Helfat and Peteraf (2003: 1005)

Agarwal and Helfat (2009: 282) note "strategic renewal" is one type of "strategic change", which they define as the "refreshment or replacement of attributes of an organization that have the potential to substantially affect its long-term prospects." Strategic renewal therefore

concerns the refinement of existing capabilities (Floyd and Lane, 2003). Helfat and Peteraf (2003) argue that renewal primarily involves improving an existent capability through the search for new alternatives, which might lead to minor or major resource based modifications. Sirmon et al. (2007) discussion on the "stabilizing" process, which forms part of the "bundling" process, also provides insight on how firms make incremental improvements to existing capabilities. Specifically, the authors argue that when firms hold a current competitive advantage they will often engage in stabilizing to maintain this advantage (2007: 281). This modification process therefore involves the continuous and gradual "refreshment" of a firm's resource base, to avoid inertia that slowly rots a firm's competitive advantage (Capron and Mitchell, 2009).

Replication is a modification process that involves reproducing the same capability in a new geographic market (Winter and Szulanski, 2001). Szulanski and Jensen (2008) note franchising is the most common replication strategy as it enables firms to standardise their capabilities across multiple geographic markets. In innovation-based firms, replication might occur when firms attempt to replicate their business model in multiple foreign markets (Doganova and Eyquem-Renault, 2009). Whereas, the "global strategy" literature provides ample examples of when organisations standardise their capabilities across multiple foreign markets (Bartlett and Ghoshal, 1991; Ghemawat, 2003; Peng and Miles, 2009). However, Sapienza et al. (2006: 924-925) propose that in the case of young firms which internationalise early, they are more likely to survive and grow when they redeploy their limited resources across multiple capabilities. Thus, the authors argue young firms need fungible resources (e.g. a platform technology) to pursue several heterogeneous foreign market opportunities at a comparatively lower cost (2006: 924-925).

Redeployment therefore involves modifying an existing capability to serve a new, but closely related product or service market (Helfat and Peteraf, 2003). Helfat and Raubitschek (2000) note this sort of transfer often requires some alteration of the capability in order to serve the new market. Helfat and Peteraf (2003: 1006) also emphasise that redeployment may take one of two forms. The first form is when a firm redeploys an existing capability to a new market. Madhok (1997) notes in the case of internationalisation, the firm can redeploy their capabilities such as their core technology through a combination of foreign market entry modes. That is the firm might directly export their core product to one foreign market, learn from it, and simultaneously license their intellectual property to another foreign market. Whereas the second form of redeployment involves the inter-temporal transfer of capabilities

from one market (i.e. a declining one) to a new market (i.e. such as an emerging foreign market) that exhibits greater growth potential (Luo, 2000, 2003).

Recombination is a central resource modification process (Helfat and Winter, 2011). Helfat and Peteraf (2003) note that recombination is an alternative to renewal it creates new capabilities opposed to improving existing ones. Based on Schumpeterian logic, numerous scholars consider combination as a core capability building mechanism (Nelson and Winter, 1982; Kogut and Zander, 1992; Teece et al. 1997; Dosi et al. 2000). Teece (2007: 1338) emphasises that combination is inherently entrepreneurial in which firms match and integrate co-specialised assets. For example, combining a biotechnology start-ups R&D capability with a manufacturer's unique production capability can lead to the creation of new capabilities in biomedical research (Pisano, 1990). Sirmon et al. (2077) discussion on "pioneering" also forms part of the "bundling" process, which provides insight into how firms recombine resources. Interestingly, the authors emphasise "recombination" and "combination" are distinct processes, in that the former uses *existing* resources to create capabilities, while the latter uses *new* resources to create new capabilities. Sirmon et al. (2007: 282) thus note combination and recombination are creative modification process that address highly competitive contexts. Therefore, on close examination of resource modification, it is evident that multiple processes underpin this asset orchestration function.

2.5 Conclusion

In conclusion, this chapter selects Helfat et al. (2007) asset orchestration framework as a theoretical lens to help navigate this research study. After an initial review of dynamic capabilities theoretical foundations, it became clear that evolutionary (Nelson and Winter, 1982), transaction costs (Williamson, 1975, 1985) and resource based (Dierickx and Cool, 1989) theory underpin the dynamic capabilities perspective. These established theories are influential in their own right and reinforce Helfat and Peteraf's (2009) argument that dynamic capabilities have a strong theoretical foundation. Nevertheless, this chapter identifies that numerous perspectives and conflicting interpretations burden the dynamic capabilities literature. Barreto (2010) argues that given dynamic capabilities is an emerging perspective, it is most likely that multiple perspectives will continue to surface before the paradigm reaches theoretical maturity. Since this ambiguity creates challenges for doctoral research, the researcher examined the seminal dynamic capability perspectives in order to select a robust theoretical lens.

The author argues there are three major benefits that justify the selection of Helfat et al. (2007) theoretical lens. Firstly, unlike early perspectives (e.g. Eisenhardt and Martin, 2000), asset orchestration provides the opportunity to select a process lens that enables a thorough exploration of dynamic capability development and deployment. That is, asset orchestration focusses on search and selection as well as configuration and deployment processes, which provide a platform for granular research on the nature, processes, and outcomes of dynamic capabilities. Secondly, asset orchestration aims to reveal the microfoundations (Teece, 2007; Helfat et al. 2007) of dynamic capabilities through the examination of *how* individual entrepreneurs engage in strategic management processes such as resource allocation, investment, and reconfiguration. Moreover, unlike previous perspectives (e.g. Zollo and Winter, 2002) that focus on large firms, Helfat et al. (2007) argue asset orchestration is relevant to new ventures that compete in high-velocity markets. Given the aim is to explore *how* technology start-ups build dynamic capabilities in networking to enable NVI, asset orchestration is a useful lens through which to conduct this research.

Finally, the author selects Helfat et al. (2007) perspective of asset orchestration over Teece (2007) for the reason this study aligns with section 2.3.2 view that dynamic capabilities core purpose is to alter the resource base rather than sustain competitive advantage. This perspective then enables the researcher to focus on how individual entrepreneurs and their new ventures create, extend, and modify their resource base to enable NVI. Having introduced this theoretical lens, Chapter 3 will discuss NVI in context of capability development, while Chapter 4 will use dynamic capabilities as a lens to examine the process of networking and social capital accumulation. The asset orchestration framework thus navigates the remainder of this thesis.

3 – New Venture Internationalisation: A Capability Building Process

Chapter Aim

To review literature that sheds light on the capability building process within new venture internationalisation.

Chapter Objectives

- **To review the theoretical elements that underpin new venture internationalisation theory.**
- **To examine early internationalisation research that helps explain the building of capabilities in new venture internationalisation.**
- **To review literature that explores the building of dynamic capabilities in new venture internationalisation.**

3.1 Introduction

This chapter aims to review literature that sheds light on the capability building process within NVI. This chapter therefore intends to achieve three objectives. Firstly, this chapter will review the theoretical elements that underpin NVI theory. This section will indicate that this theory draws on international business, entrepreneurship, and strategic management theory. Secondly, this chapter will examine early internationalisation research that helps explain the building of capabilities in NVI. This chapter will also adopt the argument that early internationalisation is a process of capability development. Thirdly, this chapter will review literature that explores the building of dynamic capabilities in NVI. This chapter will therefore provide a theoretical context for this doctoral research and conclude with the view that the INV is a fertile empirical setting to conduct dynamic capabilities research.

3.2 New Venture Internationalisation – Theoretical Foundations

NVI theory has received significant attention due to the premise that INVs are incongruent with traditional views on multinational enterprises (MNEs) (Oviatt and McDougall, 1994, Autio, 2005; Zahra, 2005). Thus, McDougall et al. (1994) original contention is that traditional IB theory such as product lifecycle (Vernon, 1979), stage (e.g. Bilkey and Tesar, 1977; Johanson and Vahlne, 1977, 1990), oligopolistic reaction (Knickerbocker, 1973) and internalisation (e.g. Buckley and Casson, 1976) theories do not explain these variances. Autio (2005) also argues NVI theory aims to explain *why* new ventures engage in accelerated internationalisation. Oviatt and McDougal (1994) therefore was positioned as a direct challenge to Johanson and Vahlne's (1977, 1990) process theory of internationalisation that seeks to explain a firm's gradual involvement in international markets. Consequently, section 3.3 reviews the debate between process and NVI theories, but the general view is that INVs are unique organisational forms that draw upon multiple strands of IB, entrepreneurship and strategic management theory (Zahra and George, 2002).

Indeed, Sapienza et al. (2005) argue for many new ventures, internationalisation is not just an afterthought, but also now an "essential gambit" that inevitably alters the focus and direction of a company. Therefore, early discussion on early and rapid internationalisation of new ventures included research on "born globals" (Rennie, 1993; Knight and Cavusgil, 1996; Madsen and Servais, 1997), "international new ventures" (Oviatt and McDougall, 1994), "instant internationals" (Preece et al. 1999), "entrepreneurial instant exporters" (McAuley, 1999), "international ventures" (Kuemmerle, 2002) and "micro-multinationals"

(Dimitratos et al. 2003; Ibeh et al. 2004). However, despite these various labels, there is widespread agreement that Benjamin Oviatt and Patricia McDougall's publication *Toward a Theory of International New Ventures* (1994) is the seminal study that underpins NVI theory[2].

Oviatt and McDougall (1994: 49) define an INV as "a business organization that from inception, seeks to derive significant competitive advantage from the use of resources and the sale of output in multiple countries." Oviatt and McDougall therefore combine theory on internalisation (e.g. Buckley and Casson, 1976), alternative governance structures (Vesper, 1990; Williamson, 1991), foreign location advantage (Dunning, 1988), and control over unique resources (Barney, 1991) as the four major elements of sustainable INVs. Within this framework, Oviatt and McDougall (1994: 52-54) argue that (1) coordination of value chain activities (few versus many) and the (2) number of countries involved (few versus many) reveals four types of INV. Thus, INVs include: (1) export/import start-ups, (2) multinational traders, (3) geographically focussed start-ups, and (4) global start-ups. Export/import start-ups therefore coordinate few value chain activities in only few countries, while multinational traders coordinate a few activities but within an array of foreign markets. Geographically focussed start-ups therefore coordinate many cross-border activities but within a specific region, and global start-ups derive significant competitive advantage from extensive coordination of activities in multiple geographical locations (1994: 58-60).

NVI theory is therefore a fundamental branch of what has become international entrepreneurship (IE) research (Oviatt and McDougall, 2005; Keupp and Gassmann, 2009; Jones et al. 2011). Table 3-1 indicates that various scholars seek to define IE, which McDougall and Oviatt (2000) argue is frequently at the intersection of entrepreneurship (Giamartino et al. 1993) and IB (Wright and Ricks, 1994) research paths. Whereas, Zahra and George (2002b) argue strategic management theory continues to influence IE research due to discussion on issues such as unique resources and industry competitiveness. Table 3-1 therefore chronologically lists the various contributions that seek to define IE research.

[2] Oviatt and McDougall (2005b) retrospectively discuss the origins and importance of their 1994 paper having won the 2004 *Journal of International Business Studies* Decade Award.

Table 3-1: Definitions of International Entrepreneurship Research

Study	Definition
McDougall (1989)	"the development of international new ventures or start-ups that, from their inception, engage in international business, thus viewing their operating domain as international from the initial stages of the firm's operation." (1989: 387)
Zahra (1993)	"the study of the nature and consequences of a firm's risk-taking behaviours as it ventures into international markets." (1993: 9)
McDougall and Oviatt (2000)	"a combination of innovative, proactive, and risk-seeking behaviour that crosses national borders and is intended to create value in organizations." (2000: 903)
Zahra and George (2002)	"the process of creatively discovering and exploiting opportunities that lie outside a firm's domestic markets in pursuit of competitive advantage" (2002b: 261).
Kuemmerle (2002)	"The development of international new ventures or start-ups that, from their inception, engage in either home-base-augmenting (HBA) or home-base-exploiting (HBE) activities or both, thus viewing their operating domain as international from the initial stages of the firm's operation." (2002: 105)
Oviatt and McDougall (2005a)	"the discovery, enactment, evaluation, and exploitation of opportunities – across national borders – to create future goods and services." (2005: 540)

Source: The Author

Oviatt and McDougall (2005a) argue that the interpretations in Table 3-1 have meant IE has emerged on two branches where one branch focusses on the cross-national-border *behaviour* of entrepreneurial actors (i.e. NVI) and the second focusses on the cross-national-border *comparison* of entrepreneurs, their behaviour, and the circumstances in which they are embedded (i.e. international comparisons of entrepreneurship). Due to these two research streams, the authors redefine IE as "the discovery, enactment, evaluation, and exploitation of opportunities – across national borders – to create future goods and services" (2005: 540). This redefinition then synthesises research on opportunity (i.e. Zahra and George, 2002b) and cross-border activities (i.e. Kuemmerle, 2002) in order to unify this previous research. Therefore, the researcher aims to examine NVI research with the view to investigate the cross-national-border behaviour of entrepreneurial actors that consists of individual entrepreneurs, groups, and organisations. The prime objective of this section will review the theoretical elements that underpin NVI theory to gain a deeper understanding of new ventures that operate in multiple foreign markets.

3.2.1 Internalisation and Alternative Governance Advantages

The internalisation of some transactions (i.e. Williamson, 1985) is the first element of NVI theory and is one of the most fundamental elements that underpins theories of the MNE (Buckley and Casson, 1976; Teece, 1977; Hood and Young, 1979; Rugman, 1981; Dunning, 1980; Hennart, 1982). Buckley (1988: 181) argues the internalisation approach to MNE

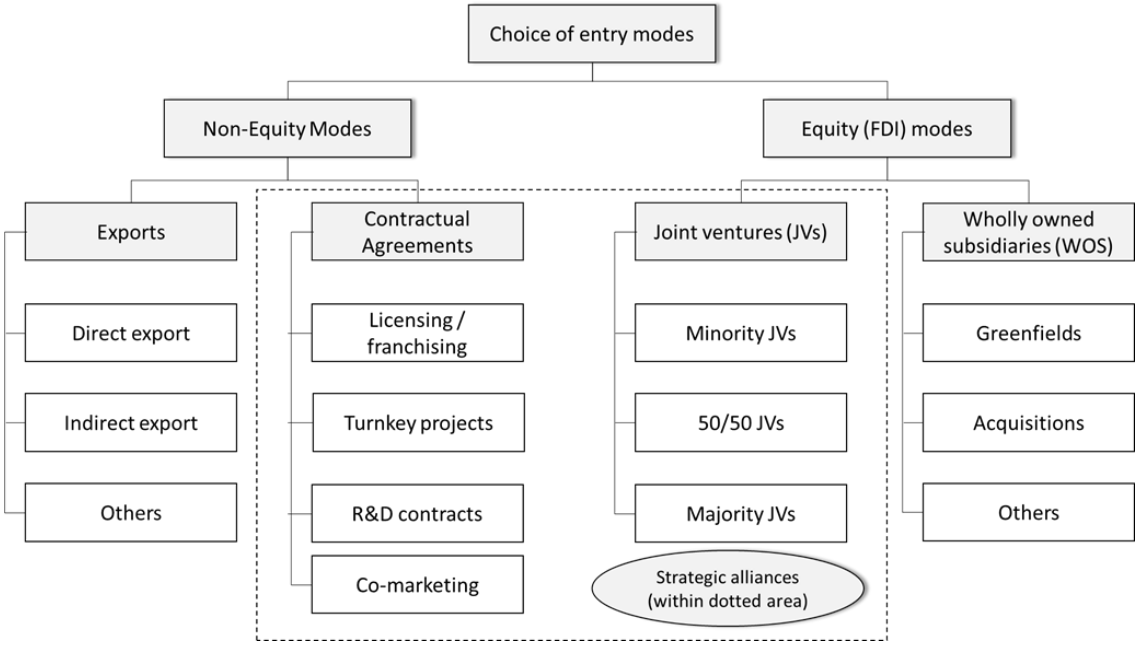
theory rests "on two general axioms: (1) Firms choose the least cost location for each activity they perform, and (2) firms grow by internalizing markets up to the point where benefits of further internalization are outweighed by the costs." MNE theory therefore assumes firms will initially develop a "firm-specific advantage" within its domestic market, and if it is not possible to exploit and safeguard this advantage through foreign market or contractual transactions, the firm will "internalise" these cross-border operations (Rugman, 1981). Oviatt and McDougall (1994: 54) therefore argue the latter point is central to INVs, as all organisations large or small must own "some" assets, otherwise they will have nothing valuable to trade within an economic transaction. However, unlike MNEs that vertically integrate across national borders, INVs are more likely to internalise a limited number of transactions, such as upstream activities that specialise in R&D and/or production (Jones, 1999; Kuemmerle, 2002).

Therefore, a core difference between MNEs and INVs is the latter lack the sufficient resources to control many assets through ownership, and must rely on alternative governance structures (i.e. strategic alliances) to access vital assets (Oviatt and McDougall, 1994). In IB research, Hennart (1988) notes that firms use foreign market entry modes as governance structures to organise their interdependence between countries. Root (1994: 5) defines an international market entry mode as "an institutional arrangement that makes possible the entry of a company's products, technology, human skills, management, or other resources into a foreign *country*." Various IB researchers categorise foreign entry modes such as exporting (e.g. indirect and direct exporting), contracts (e.g. licensing, franchising), joint ventures (JVs) and wholly owned subsidiaries (WOS) on a continuum of risk, control, and resource commitment (Young et al. 1989; Erramilli and Rao, 1990; Hill et al. 1990, Root, 1994). Brouthers and Hennart (2007) note exporting generally has the lowest risk, control and level of commitment, while WOSs are at the opposite end of the spectrum, with the highest level of risk, control and commitment. Figure 3-2 therefore illustrates that alternative governance structures are either non-equity based contracts such as licensing and franchising, or equity based contracts such as minority or 50/50 JV agreements (Pan and Tse, 2000; Peng, 2009).

Researchers use various perspectives to investigate the use of "alternative governance" structures on NVI (e.g. Bell, 1995; Coviello and Munro, 1995, 1997; Zacharakis, 1997; Casson, 1997; Jones, 1999; McNaughton, 2002). Bell (1995) for example was early to identify that small software firms use various foreign entry modes such as direct exporting

and licensing to support early internationalisation. Similarly, Zacharakis (1997) takes a TCE perspective to propose that a small firm's "strategic alliance strategy" encapsulates the use entry modes such as licensing and JVs to support international expansion. Relatedly, Jones (1999) empirically finds that "international entrepreneurs" use multiple inward, outward, and cooperative R&D, production and sales and marketing cross-border activities to facilitate early internationalisation. However, Oviatt and McDougall (1994: 55) note a more "powerful resource-conserving alternative to internalization" involves the use of informal and formal network relationships (e.g. Aldrich and Zimmer, 1986; Larson, 1992) opposed to formal contracts. Subsequently, Oviatt and McDougall (2005a) elaborate on this initial discussion and propose that network relationships moderate the speed of NVI.

Figure 3-1: Foreign Market Entry Modes



Source: Peng (2009: 165) who adapted from Pan and Tse (2000: 538)

Networks (e.g. Coviello, 2006) and social capital (e.g. Yli-Renko et al. 2002) are therefore fundamental to NVI as they have help overcomes resource shortages (Bell, 1995; Coviello and Munro, 1995, 1997), build legitimacy (Fernhaber and McDougall, 2009) and identify foreign market opportunities (Loane and Bell, 2006; Al-Laham and Souitaris, 2008). However, the limited studies that investigate an INV's networking behaviour use various perspectives such as "network dynamics" (Coviello, 2006), "network development" (e.g. Wakkee, 2006), social capital dynamics (e.g. Prashantham and Dhanaraj, 2009), and "networking capability" (e.g. Mort and Weerawardena, 2006). Chapter 4 therefore aims to

review these networking perspectives, as they are central to this thesis. Furthermore, this study supports Coviello and Munro's (1997) view that an INV's network comprises of informal (i.e. inter-personal) and formal (i.e. inter-firm strategic alliances) network relationships, which allows a broader examination of NVI.

3.2.2 Foreign Location Advantages

Oviatt and McDougall (1994: 55) argue foreign location advantage is the third element that distinguishes INVs from domestic new ventures. Foreign location advantages are rooted in Dunning's (1980, 1988) eclectic theory of international production – i.e. the "eclectic paradigm" – that seeks to explain the incentives of *why* firms choose FDI. Dunning argues that the ownership (O), location (L) and internalisation (I) advantages determine the extent, form, and pattern of an MNE's international production. In terms of INVs, Oviatt and McDougall (1994) argue that Dunning's discussion on locational advantages is particularly important as it helps explain *where* cross-border activity should be located. Kuemmerle (2002) argues that location advantages indicate the profitability potential of exploiting an international ventures ownership advantage (e.g., proprietary knowledge) in combination with a foreign country's indigenous resources. Locational advantages can arise when a foreign market has a (1) high demand for a firm's products or services; is (2) rich in natural, physical, and human resources; or is (3) agglomerated into specialised clusters of economic activity (Dunning, 2000).

However, Meyer and Peng (2005) emphasise that attractive foreign markets such as the emerging economies also have "locational disadvantages" such as political instability, high trade barriers, weak appropriability regimes, and high psychic distance. Oviatt and McDougall (1994: 55) therefore argue MNEs can overcome these obstacles with "advantages of scale" whereas INVs are more likely to rely on proprietary knowledge and build alliances with local firms to compete in such markets. For example, research has found foreign regulatory regimes has a higher influence on the speed of NVI than industry and firm characteristics (Coeurderoy and Murray, 2008). Kuemmerle (2002) also examines the international entrepreneur's choice of central location – their "home base" – in which the INV can manage knowledge flows that stem from home base-augmenting (HBA) and home base-exploiting (HBE) cross-border activities. Kuemmerle (2002) argues INVs are more likely to engage in initial HBA activities (i.e. R&D and NPD) prior to HBE activities (i.e. manufacturing, sales, and marketing). Thus, this is a dramatic departure from traditional

views that exporting represents a firm's initial involvement in international markets (McDougall et al. 2003; Fernhaber et al. 2008).

Gabrielsson and Kirpalani (2004) argue born global firms who originate from small domestic markets such as Australia, Finland, Israel and Taiwan are similar to INVs as they leverage proprietary technology to penetrate global markets. Rennie (1993) was the first to use the term "born global" to identify firms whose exports account for 76% of total sales after two years from foundation by coordinating cross-border activities in multiple countries. Knight and Cavusgil (1996: 11) define born globals as "small, technology orientated companies that operate in international markets from the earliest days of their establishment." Relatedly, Madsen and Servais (1997) argue born globals produce highly specialised products for international niche markets and are not limited to a single market. Central to this view, is a born-globals knowledge base is highly mobile and are combined with less mobile resources (e.g. manufacture/distribution) in multiple countries to exploit competitive advantage (Moen and Servais, 2002; Chetty and Campbell-Hunt, 2004). Similarly, research on global start-ups (Oviatt and McDougall, 1994; Oviatt et al. 1995), which is the most radical form of INV, aligns with born-globals as they derive competitive advantage from extensive coordination of activities in multiple geographic regions.

However, research on "foreign locational advantages" has begun to question whether small firms actually implement a global strategy (Bell et al. 2001; Rugman and Verbeke, 2007; Lopez et al. 2009). For example, Bell et al. (2001) introduce the notion of the "born-again global" and argue most small technology firms are unlikely to implement a global strategy as firms undergo stochastic periods of rapid internationalisation, de-internationalisation and re-internationalisation. In addition to these findings, Rugman and Almodóvar (2011) go as far to argue there is a "born-global illusion" as most manufacturing firms cross-border activities only take place in one of the triad regions (i.e. North America, Europe, Asia-Pacific). Lopez et al. (2009) also highlights Rugman and Verbeke's (2007) regionalisation discussion as they argue "born-globals" are actually "born-regionals" as they found Costa Rican technology firms initially export to Central and South America, despite the strategic importance of the US market. However, Jones et al. (2011) argue research on born-globals and INVs often uses terminology loosely and interchangeably. Which leads Coviello et al. (2011: 628) to remind scholars that Oviatt and McDougall choose to use the term INV in recognition that many ventures compete primarily in regional markets (i.e. in a few

countries) while only a select few have a true global focus. Therefore, this debate illustrates foreign locational advantages strongly underpin NVI theory (Fernhaber et al. 2007).

3.2.3 Control over Unique Resources

The control over unique resources (i.e. Barney, 1991) is the fourth and final element that underpins NVI theory (Oviatt and McDougall, 1994). Oviatt and McDougall (1994: 56) argue that the previous elements – (1) internalisation, (2) alternative governance structures, and (3) foreign location advantages – are the necessary conditions for sustainable INVs, while (4) unique resources are the sufficient condition for INVs sustainable competitive advantage. Peng (2001: 815) reviews the RBV in IB research and predicts the RBV literature in IE is in its "infancy" and "will grow more substantially in the new millennium." Consequently, D'Angelo and Warner (2010) review Peng's predictions and find the RBV continues to advance IE research but predominately within the IB journals (e.g. Boojhawon et al. 2007; Zucchella et al. 2007; Filatotchev et al. 2009). Consequently, D'Angelo and Warner (2010) report that Westhead et al. (2001) is the most cited RBV-IE study within entrepreneurship research. Westhead et al. (2001) uses the RBV to examine the influence of human and financial resources on the internationalisation of new and small firms. Specifically, the authors empirically find that the managerial experience of principal founders in selling goods or services abroad is the most "valuable" resource that encourages new and small firms to export (2001: 334).

These findings align with Oviatt and McDougall's (1994) original contention that an INV's most unique resource is its knowledge base. Since then, various researchers have conceptually (e.g. Prashantham, 2005; Sapienza et al. 2006) and empirically (e.g. Autio et al. 2000; Zahra et al. 2000; Gassmann and Keupp, 2007) demonstrated that knowledge is an INV's most unique and valuable resource. Therefore, Oviatt and McDougall (1994) underscore the importance of profiting from strong appropriability regimes (e.g. patents, copyrights, and secrecy), isolating mechanisms (e.g. casual ambiguity), and network governance structures (e.g. co-specialisation) as strategies to protect an INV's knowledge based competitive advantage. Interestingly, the emergence of the KBV (i.e. Grant, 1996; Miller and Shamsie, 1996) has helped advance NVI research. For example, Prashantham (2005) conceptually builds on the KBV to propose that the INV's *acquisition* and *creation* of market and technological knowledge through its social capital, is what directly enhances NVI. Loane and Bell (2006) empirically use the KBV as lens to examine the role of networks

on the rapid internationalisation of entrepreneurial firms. Central to their cross-national findings is the majority of the entrepreneurial firms use existing and new networks to acquire international knowledge, which improves their international competitiveness (479-480). Similarly, Gassmann and Keupp (2007) use the KBV to examine the competitive advantage of biotechnology ventures that undergo early and rapid internationalisation. In this inductive study, the authors argue that born-global firms have greater rent generating potential when they build "specialised knowledge" from unique NPD that is scalable and specialised within international value chains. Moreover, the authors argue such specialised knowledge enables firms to use scientific networks to bypass ownership of physical assets (e.g. production capacity) and access "on demand" resources to capitalise on early rent potential (2006: 362).

Interestingly, Autio (2005) notes the emergence of knowledge-based research has helped advance NVI theory in ways Oviatt and McDougall never intended. That is, Autio (2005) argues "knowledge" is the primary driver of international expansion that unites rather than divides the process (Johanson and Vahlne, 1977, 1990) and new venture (Oviatt and McDougall, 1994) theories of internationalisation. Moreover, Sapienza and colleagues (Autio et al. 2000; Sapienza et al. 2005; Sapienza et al. 2006) infer early internationalisation is a process of capability development in which both theories help explain this phenomenon. That is, Johanson and Vahlne (1977, 1990) seeks to question *how* firms internationalise, while Oviatt and McDougall (1994) specifically question *why* new ventures internationalise (Autio, 2005). Given this chapter, aims to review literature on INV capability development it seems evident internationalisation process theory can help shed additional light on achieving this overall aim. The following section will therefore examine early internationalisation research that helps explain the development of capabilities within INVs.

3.3 Early Internationalisation: A Capability Building Process

Section 3.2 reviews the theoretical elements that underpin NVI theory and highlights the observation that Johanson and Vahlne's process theory could shed additional light on capability building within INVs. Thus, the prime objective of this section is to examine early internationalisation research that helps explain the building of capabilities in INVs. Johanson and Vahlne (2006, 2009) note although researchers perceive their original theory (i.e. 1977/1990) as a process of "late internationalisation" the authors emphasise they do not discredit the process of early internationalisation. Instead, Johanson and Vahlne (2009) acknowledge some firms do engage in early internationalisation, but maintain most firms

gradually increase their international commitment as they build foreign market experience. Indeed, several behavioural models of internationalisation seek to explain *how* firms enter and expand within foreign markets which Andersen (1993) terms the (1) innovation models (Bilkey and Tesar, 1977; Cavusgil, 1980; Czinkoata, 1982; Reid, 1981) and (2) Uppsala model (Johanson and Vahlne, 1977, 1990). These models depart from the above economic theories that explain MNE [and INV] transaction cost reduction, to explain internationalisation as a dynamic process characterised by organisational learning, knowledge, and change (Johanson and Vahlne, 1990: 18).

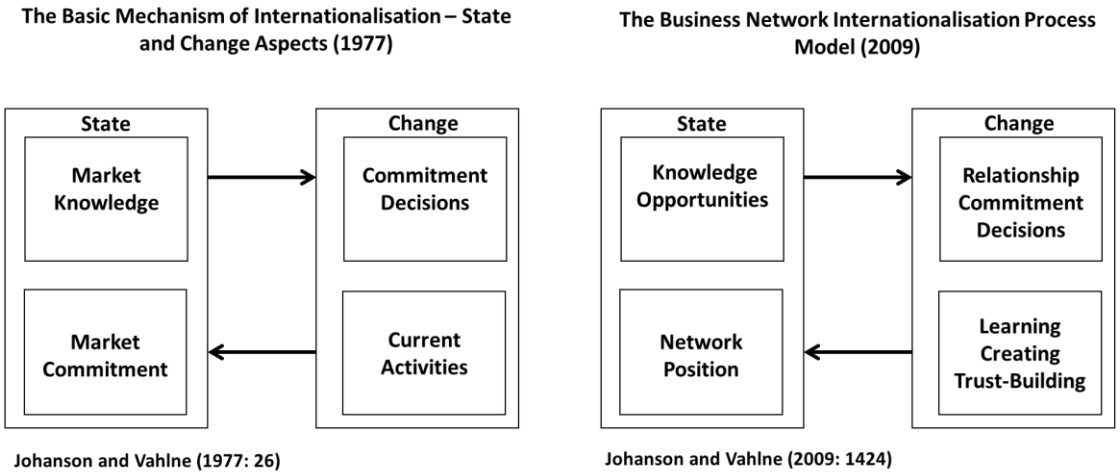
Welch and Paavilainen-Mantymaki (2014) argue that all of the behavioural models share the assumption that internationalisation does not begin with FDI, as firms gradually make small, cautious, and progressive steps as they enter and expand within foreign markets. Relatedly, Andersen (1993) notes the major point of difference between the innovation and Uppsala model is the former focusses on firms exporting behaviour, while the latter moves beyond international trade, and examines the use of FDI for subsequent expansion. Therefore, the underlying theoretical mechanism of Johanson and Vahlne's process theory is that internationalisation "evolves in an interplay between the development of knowledge about foreign markets and operations on one hand and an increasing commitment of resources to foreign markets on the other" (1990: 11). Thus, the authors propose state variables (market knowledge and market commitment) interact with change variables (commitment decisions and current activities) to produce an incremental, self-reinforcing, and path dependent pattern of international expansion (Autio, 2005: 10).

Recently, Johanson and Vahlne (2009) adapted their 1977 U-Model in response to widespread research on business networks. In what they term "A Business Network Model of the Internationalization Process" they incorporate business network (e.g. Johanson and Mattsson, 1988) and opportunity (see section 2.3.1) theory into the U-Model. Johanson and Mattsson (1988) originally argue the network model of internationalisation assumes the knowledge of other firms in a network influence a firm's decision-making. The network model (see section 4.2.2) thus argues individual firms have a network position that determines the resources they are able to access from other partners within the industrial network (1988: 295). Consequently, Johanson and Vahlne's (2009) revision explicates firms encounter "liabilities of outsidership" if they attempt to enter foreign markets with no relevant network position. Thus, involvement in foreign networks of relationships creates

"insidership", where firms learn, build trust and commitment, and are the essential elements of the internationalisation process (2009: 1415).

Johanson and Vahlne (2009) note although the basic structure is the same as the 1977 model, they incorporate some important changes. Firstly, building on Johanson and Vahlne (2006), they include recognition of "opportunities" as part of the "market knowledge" concept to stress that opportunities are "discovered" from knowledge that resides within networks that consequently trigger the internationalisation process. Secondly, the authors replace "market commitment" with "network position" to explicate that internationalisation occurs *in* networks, while subsequent network positions determine the future exploitation of opportunities. Relationship development is then central to internationalisation process. Johanson and Vahlne (2009) also replace "commitment decisions" with "relationship commitment decisions" and "current activities" with "Learning [and] creating trust-building" to explicate that relational development in foreign markets is a complex, uncertain and time consuming process which involves considerable commitment on part of the entering firm. Figure 3-2 therefore outlines the evolution of internationalisation process theory.

Figure 3-2: The Evolution of Internationalisation Process Theory



Source: Based on Johanson and Vahlne (2009)

Chapter 4 and 5 extensively discuss these networking issues at length, as they underpin this overall thesis, which argues networking is a process of dynamic capability development. Consequently, given that Johanson and Vahlne (2009) and Oviatt and McDougall (2005) have both revised process and NVI theory, it is evident Autio and colleagues (Autio et al.

2000; Autio, 2005; Sapienza et al. 2006) initial argument that earlier theories complement one another is significant to this research. The following section will therefore identify and articulate the major capability assumptions that underpin Johanson and Vahlne (2009) as well as Oviatt and McDougall (2005) to help explain the process of early internationalisation. Therefore, this section aims to examine such theory to help explain the development of capabilities within INVs.

3.3.1 Early Internationalisation Capabilities

Table 3-2 identifies and articulates the major capability assumptions that underpin process (Johanson and Vahlne, 2009) and new venture (Oviatt and McDougall, 2005) theories of internationalisation. Firstly, it is evident the assumptions of these theories differ due to their ontological positioning. For example, behavioural (Cyert and March, 1963) and growth (Penrose, 1959) theory ontologically underpin the process theory of internationalisation, whereas MNE (Buckley and Casson, 1976; Dunning, 1980), strategic management (Barney, 1991) and entrepreneurship (Katz et al. 1988; Vesper, 1982) theories underpin NVI theory. Johanson and Vahlne (2009: 1418) therefore argue their epistemology on bounded rationality leads to uncertainty, but emphasise firms "reduce" rather than "avoid" uncertainty by accumulating experiential knowledge[3]. Whereas, Oviatt and McDougall's (2005) assumptions are more implicit as they adopt the view entrepreneurs take calculated risks rather than avoid uncertainty. However, since economic based theories underpin their 1994 model of sustainable INVs, while their 2005 model is a precise interpretation of the speed of internationalisation, it is evident new venture theory is more static in comparison to the dynamics of internationalisation process theory.

Section 3.2.3 emphasises Autio's (2005) comments that "knowledge" unites the original process (i.e. 1977/1991) and new venture (i.e. 1994) theories of internationalisation. Since then, there appears to be greater commonalities within these reconceptualisations. Firstly, Johanson and Vahlne (2009: 1416) acknowledge Oviatt and McDougall (1994) research and argue "general internationalisation knowledge" encompasses several strands of experience including Sapienza et al. (2006) discussion on "foreign market entry" experience. Oviatt and McDougall (2005) however are more specific and argue that "foreign market knowledge" and "knowledge intensity" (i.e. technological knowledge) moderates the speed of

[3] Johanson and Vahlne (2009: 1418) dismiss previous criticism that their theory is about uncertainty avoidance, and argue internationalisation will always involve uncertainty, but their theory is more about uncertainty reduction – i.e. risk management.

internationalisation. Secondly, both theories now emphasise that the discovery and enactment of opportunities is a primary driver of early internationalisation. Therefore, echoing Zahra (2008: 243), it is apparent these reconceptualisations implicitly adopt Penrose's (1959: 73) assumption that [opportunity discovery and creation] form a virtuous and dynamic cycle of experiential learning. Finally, both theories acknowledge networks as a driver of early internationalisation, but the forthcoming discussion on Table 3-2 highlights these theories take different perspectives on the nature of networks.

Table 3-2: Capability Assumptions about Early Internationalisation

	IPT – Johanson and Vahlne (2009)	INV – Oviatt and McDougall (2005)
Primary theoretical question	• *How* do firms internationalise?	• *Why* do entrepreneurial firms internationalise?
Ontology	• Behavioural theory • Theory of the growth of the firm • Network model of internationalisation	• Entrepreneurship • RBV • Alternative governance structures
Epistemology	• Uncertainty reduction	• Calculated risk
Level of analysis	• Firm	• Entrepreneur / new venture
Primary driver of early internationalisation	• Knowledge opportunities (i.e. experiential knowledge) • Network position	• Foreign / technological knowledge • Technology / Competition • Network relationships
Nature of path dependence	• Country-specific lock-in	• Regional or global lock-in
Strategic posture	• Reactive to internal environment	• Proactive to external environment
Nature of competition	• Compete with local players in foreign markets	• Compete with global players in niche foreign markets
International expansion patterns	• Gradual pace • Establishment chain indicator of internationalisation pattern	• Rapid pace • Multiple modes indicator of internationalisation pattern
Nature of resources	• Slack resources	• Fungible resources
Nature of networks	• Industrial networks • Buyers and suppliers • Trust and commitment	• Entrepreneurial networks • Social and business networks • Brokerage
Major cost	• Learning and unlearning	• Cross-border coordination
Major risk	• Slow response to market change	• Unsuccessful coordination
Objectives of early internationalisation	• Sustained survival • Long-term profitability	• Rapid growth • Value creation

Source: The Author

Autio (2005) emphasises assumptions on path dependence differ between the process and new ventures theories of internationalisation. Johanson and Vahlne (2009) maintain that "history matters" and the actions of the firm in specific foreign markets supersedes the relevance of individuals' prior experience. Thus, using path dependence terminology (e.g. Arthur, 1989) Johanson and Vahlne indicate that firms encounter "country-specific" lock-in where previous foreign experiences bound the firm to specific local markets. For instance, in INV theory, "export/import start-ups" would likely encounter "country-specific lock-in"

as they coordinate few cross-border activities in limited countries. Whereas, Autio (2005) highlights early forays into international markets can lock firms into an international or global growth trajectories. In other words, INVs can encounter "regional" (i.e. geographically focussed start-up) or "global" (i.e. global-start-up) lock-in. This indicates international entrepreneurs' and their new ventures require an eclectic bundle of capabilities to undergo various forms of early internationalisation.

The patterns and pace of international expansion also seem to differ between theories. That is, Oviatt and McDougall are explicit the pace of early internationalisation is rapid, while Johanson and Vahlne accept foreign market entry can be early but maintain the pace of internationalisation is typically gradual. Interestingly, Johanson and Vahlne argue Johanson and Wiedersheim-Paul's (1975) initial observations on (1) psychic distance and the (2) establishment chain triggered the development of the Uppsala model, but the authors argue their theory "is not an establishment chain" in which firms pursue a pattern of international trade and FDI in a stepwise manner (2006: 2). Instead, Johanson and Vahlne (2009) argue psychic distance and the establishment chain are indicators rather than determinants of gradual internationalisation. In contrast, Oviatt and McDougall (2005) argue the combined use of various entry modes in multiple foreign markets are an indicator of the patterns of early internationalisation. Thus, this indicates INVs must accumulate various resources and capabilities to implement such strategy.

The nature of resources that facilitate early internationalisation seem to differ between theories. For example, Johanson and Vahlne (2009) assume firms must have a sufficient resource endowment to increase their commitment in international markets. Whereas, Oviatt and McDougall (2005) assume the alertness of the entrepreneur is what leads to INVs to pursue foreign growth opportunities. Thus, the process and new venture theories differ as the former assumes early internationalisation depends on the amount of "slack" resources, while the latter focusses on the "fungibility" (i.e. degree of alternative use) of resources. Therefore, this analysis leads to the observation that Oviatt and McDougall's theory explains *why* entrepreneurial firms encounter "regional" or "global lock-in" through fungible resource endowments, while Johanson and Vahlne's theory explains *how* "country-specific" lock-in occurs through market-specific resource endowments.

To compensate for resource shortages, the process and new venture theories of internationalisation both consider the importance of networks, but with different

perspectives. That is, Johanson and Vahlne (2009) draw on industrial network theory (Johanson and Mattsson, 1988) and argue a central position in a business network enables gradual internationalisation. In contrast, Oviatt and McDougall initially (i.e. 1994) assume new ventures adopt alternative governance structures to accelerate internationalisation and subsequently (i.e. 2005) include research on entrepreneurial networks (i.e. Dubini and Aldrich, 1991) as a moderating force of internationalisation speed. Thus, this moves discussion from the firm's business network to the entrepreneur's personal and extended network that consists of formal and informal ties. Chapter 4 therefore provides a theoretical overview of networking and social capital, as both are central within the NVI process. Chapter 5 therefore draws upon the problem of networking capability development in NVI.

However, both theories are less explicit on the major cost of building capabilities for early internationalisation. For example, implicit in Johanson and Vahlne (2009) is that experiential learning is expensive, gradual, time consuming and less responsive to radical change. Given Johanson and Vahlne (2009) assumption that learning occurs in *established* industrial networks, this view indicates learning is efficient for understanding the modification of existing capabilities, but inefficient (i.e. costly) for understanding the creation of new capabilities. Whereas, in Oviatt and McDougall (2005), it is apparent cross-border coordination is an INV's greatest cost. Indeed, Autio et al. (2000) emphasise that although INVs benefit from "learning advantages of newness" this does not remove the liabilities of newness that stem from low reputation, social capital, and resources. Consequently, these implicit assumptions on the major cost have implications for the major risk of building capabilities for early internationalisation. That is, Johanson and Vahlne indicate the major risk of learning is a slow response to market change. Whereas, for Oviatt and McDougall the major risk of unsuccessful cross-border coordination is that mortality rates are higher in younger firms as "proactivity is not a panacea; increased risk taking may threaten survival or profitability" (Sapienza et al. 2005: 452).

Finally, both theories are explicit on the way firms deploy their capabilities to achieve early internationalisation objectives. In Johanson and Vahlne, the authors assume early internationalisation fuels gradual growth, which consequently implies that a firm's foreign market entry experience is a source of sustained survival and long-term profitability (Sapienza et al. 2006). Whereas in Oviatt and McDougall, the authors assume that early internationalisation aims to fuel rapid growth and create value across national borders. Indeed, Oviatt and McDougall (2005: 542) argue the rate of competition motivates early

internationalisation, while the advent of technology enables the need for "faster" internationalisation. These forces therefore imply Johanson and Vahlne assume the firm's strategic posture is reactive due to the limits of its internal capabilities, while Oviatt and McDougall explicate new ventures are proactive – and often aggressive – about the exploitation of external opportunities despite the limits of its internal resource base (Shrader et al. 2000). Thus, the above theories indicate the development and deployment of technological and managerial capabilities are paramount for NVI, which is the focus of the following sections.

3.3.2 Technological Capabilities

Shrader et al. (2000) regard INVs involved in high-technology markets as the personification of risk. These firms are high risk since they have a limited history of operation and profitability, have short product cycles, and must quickly defend a strategic position in international markets that are ill-defined (Carpenter et al. 2003). Zahra (2005) notes despite advances in ICT, reductions in the cost of travel and increased market access to the emerging economies, most INVs will still end in failure. Thus, to sustain competitive advantage, researchers have found INVs must build sophisticated technological capabilities and leverage this proprietary knowledge in multiple international markets (Autio et al. 2000; Shrader et al. 2000; Bell et al. 2003; Gassmann and Keupp, 2007). However, as Jolly et al. (1992: 71) points out such new ventures need to overcome two drawbacks – the challenges of being a start-up and competing against global players.

Crick and Jones (2000) emphasise among the challenges these new ventures face is the imperative to exploit their technologies in markets that are underdeveloped but exhibit international opportunities. Thus, a central source of a INVs initial expansion is to capitalise on emerging industry change that incumbents have yet to identify within specific high-technology markets (Jolly et al. 1992; Preece et al. 1999). This unique situation allows the innovator (i.e. INVs) to establish a strategic position in niche markets sooner than their competitors (i.e. followers) when these industry changes take place (Mudambi and Zahra, 2007). However, Jolly et al. (1992: 72) emphasises technology start-ups born with resource constraints will need to overcome growth challenges such as building distribution channels, confronting the liabilities of "outsidership," and accepting that local adaptation is required in most foreign markets. Therefore, the decision to implement a "global strategy" (i.e.

standardisation) or invest in a "multidomestic strategy" (i.e. local adaptation) is a significant challenge for start-ups in high-technology industries (Davies and Brush, 1997).

One view echoed by Jolly et al. (1992) is to succeed in international high-technology markets, technology new ventures should implement a global strategy through a standardised product that has the global potential to revolutionise an industry. However, Autio (1997) emphasises that such firms are sometimes wrongly associated with being representative of all new technology based firms. Instead, empirical research has found INVs will often adopt an internationalisation strategy that utilises multiple entry modes to penetrate high-technology niche markets (Bell, 1995; Jones, 1999; McNaughton, 2002). Thus, Madsen and Servais (1997) notes most INVs are actually "multidomestic" as strategic decisions on outward internationalisation (e.g. indirect exporting, direct exporting, or licensing) may vary due to regional and local issues that are apparent in specific technology markets.

Prashantham and Young (2011) note it is imperative that INVs efficiently use their technology to develop the correct product at a time when their innovation is most likely to sell within a new market. In most cases, INVs are "pioneers" as they are the first company to introduce a product or technology to a market, but normally depend on a single product for survival and growth (Zahra, 1996; Bloodgood et al. 1996). However, Preece et al. (1999: 261) notes these technology start-ups operate in high-velocity environments (Bourgeois and Eisenhardt, 1988) in which hypercompetition creates product obsolescence in months or weeks rather than in years. Central to INV growth is firms transfer technology to markets quickly whilst augmenting their technological capabilities through interactions with others in the trade sector (Crick and Jones, 2000). Bloodgood et al. (1996) note given INVs high development costs and limited resources, they must develop a strategy that quickly increases product differentiation to sustain subsequent international expansion.

Therefore, INVs that do penetrate high-technology markets have been found to benefit from "learning advantages of newness" (Autio et al. 2000) and "technological learning" (Zahra et al. 2000) which are found in industries endowed with high rates of innovation. For example, Zahra et al. (2000) empirically find INVs that utilise high-control modes to enter multiple foreign markets will increase the depth, breadth, and speed of their technological learning. Several subsequent empirical studies identify that knowledge intensity is a core source of INVs competitive advantage (e.g. McNaughton, 2001; Yli-Renko et al. 2002; Fletcher and Harris, 2012; D'Angelo, 2012). Prashantham and Young (2011) also argue an INV's

"knowledge-intensity" represents the new venture's "technological knowledge" which helps distinguish from the firm's "foreign market knowledge." The authors thus argue that "country-specific technological knowledge" allows INVs to tailor sales and marketing through more nuanced understanding of foreign client local needs and customs.

Finally, Knight and Cavusgil (2004) empirically confirm that technological learning enables INVs to build technological capabilities from the identification of new technical solutions to customer problems that occur in multiple foreign markets. Moreover, research on technological learning shows that INVs can improve future profitability by mitigating product obsolescence by leveraging their existing technological capabilities in multiple foreign markets (Crick and Jones, 2000). Zahra et al. (2000) therefore found that technological learning indirectly provides impetus to identify new market opportunities and has a direct positive impact on INV performance. Moreover, Zahra and George (2002) propose technological learning is a "non-financial outcome" that continues to drive entrepreneurship across national borders. In addition to these findings, Mudambi and Zahra (2007) argue the capabilities of the firm's TMT is vital antecedent of NVI within high-technology markets, which is the focus of the following section.

3.3.3 Managerial Capabilities

Oviatt and McDougall (2005a) note a major contrast between MNEs and INVs, is knowledge in the latter is "individualised" to the founder(s) and their TMT. In most cases, if new ventures internationalise they must recruit a TMT with the legitimacy and experience to marshal new resource (e.g. venture capital) to navigate emergent growth challenges (Fernhaber and McDougall-Covin, 2009). Bloodgood et al. (1996) indicate a TMT with a wide body of experience are more likely to overcome growth challenges and quickly launch a portfolio of products in international markets. Brinckmann and Hoegl (2011: 38) also distinguish between founding teams and TMTs as they argue founding teams are the initial "entrepreneurial team" which is more reflective of the initial start-up, while the TMT is a general team once the new venture has begun to build legitimacy.

Various empirical studies report that the international experience of TMTs and board of directors' positively influences NVI (Bloodgood et al. 1996; Reuber and Fischer, 1997; Burgel and Murray, 1998). For example, McDougall et al. (1996) case analysis shows new ventures led by managers with foreign work experience in both MNEs and INVs can internationalise faster than ventures without such experience. Carpenter et al. (2003)

research on "upper echelons" also indicates TMTs with higher levels of industry experience have more strategic choice and reduce the ventures subjective perceptions on the risk of resource intensive cross-border activities. Additionally, research on foreign education (Burgel and Murray, 1998), family history of entrepreneurship (Westhead et al. 2001), and global mindset (Nummela et al. 2004) are all found to positively influence NVI. Greater international managerial experience then provides more awareness of international opportunities and enables TMTs to navigate INVs through the complexities of multimarket competition (Carpenter et al. 2003).

Zahra (2005) notes even when an INV has a TMT and a technologically superior product in place, it must build managerial capabilities in specific areas that are necessary for superior performance. Empirical research reports that successful INVs require a wide range of managerial capabilities such as firm-specific sales capabilities to implement an exporting strategy, as well as broader strategic management skills to launch foreign sales subsidiaries (Freeman et al. 2006; Freeman and Cavusgil, 2007). In addition to these findings, De Clercq et al. (2012) identify several conceptual (e.g., Prashantham, 2005; Sapienza et al. 2006) and empirical (e.g., Zhou et al. 2010; Zou and Ghauri, 2010) studies that identify managers foreign market knowledge as a key source of INV competitiveness. For example, Prashantham and Young (2011: 283-284) distinguish between "country-neutral" and "country-specific" market knowledge where the former relates to Eriksson et al. (1997) notion of "general internationalisation knowledge" and the latter is country-specific and tacit which accumulates through direct foreign market experience.

Interestingly, Autio et al. (2000) empirically find that earlier initiation of internationalisation and greater knowledge intensity is associated with faster international growth. Central to their argument is most INVs benefit from "learning advantages of newness" over established firms when assimilating foreign knowledge. Therefore, new ventures are more dynamic in their learning and are able to adapt to changes in the marketplace and develop capabilities necessary to pursue growth in foreign markets (Autio et al. 2000: 913). Sapienza et al. (2006: 923) also argue that since INVs have few routines, they must "import" routines from the TMTs previous international experience, which serves as "embryonic routines" that reduce the initial costs of learning in foreign markets. Thus, experiential knowledge about how to perform tasks quickly at critical points in in time is a crucial factor in INV success and is often more critical than access to financial capital alone (Kuemmerle, 2002). However, Autio

(2005: 16) emphasises that neither process nor new venture theories fully develop normative implications regarding the "timing" of internationalisation.

Thus, Autio (2005) notes the major theories seek to explain *how* (i.e. Johanson and Vahlne) and *why* (i.e. Oviatt and McDougall) firms engage in early internationalisation, but neither explain ***when*** new ventures should rapidly expand their foreign operations. However, Jones and Coviello (2005) assume time is a critical element in a firm's entrepreneurial internationalisation that involves time-sensitive and self-reinforcing cycles of relationships. At a general level, Jones and Coviello indicate INV chronologies are imprinted (e.g. Kutschker et al. 1997) with early cross-border activities, while at a specific level they argue INVs differ from SMEs in terms of the time taken to commence cross-border activity and the speed or rate at which internationalisation unfolds. Jones and Coviello thus define a fingerprint pattern as "a composite of the [1] number and range of cross-border business modes established by the firm, and the [2] number and distance of countries with which those modes were established, at [3] a specific point in time" (2005: 293). These three "ridges" then form a fingerprint that provides a static impression of each firm's internationalisation behaviour at a certain point in time. Thus, Jones and Coviello argue that researchers must examine the "dynamic profiles" of the firm's internationalisation behaviour by monitoring changes in the composition of business modes and countries over a certain period of time.

Despite this conceptual research, few studies investigate an INV's capabilities for subsequent international expansion. Liesch et al. (2007: 234) for example raises the question: "What happens to early and rapidly internationalizing firms after they make their initial forays into international markets?" Although researchers (e.g. Acedo and Jones, 2007; Morgan-Thomas and Jones, 2009) assess speed in relation to foreign market entry, an INV's post-market entry is still a matter for conceptual debate (Prashantham and Young, 2011). Consequently, the emergence of dynamic capabilities have prompt researchers to suggest this may be a useful lens to examine the *timing* of NVI (Autio et al. 2000; Autio, 2005; Zahra, 2005; Sapienza et al. 2006). For example, Autio et al. (2000) acknowledges that early internationalisation may root a more innovative and dynamic strategic posture allowing new ventures to capitalise on market opportunities that emerge from rapid technological change. Therefore, the dynamic capabilities perspective appears to be a useful lens to examine NVI, which means the following section will explore literature that reveals how INVs build dynamic capabilities to overcome survival and growth challenges.

3.4 Dynamic Capability Building in International New Ventures

The prime objective of this section is to review the literature that explores dynamic capability building in INVs. Although dynamic capabilities are inherently entrepreneurial (Helfat et al. 2007; Teece, 2007), the majority of existing research focusses on large established firms (Zahra et al. 2006). Indeed, Zahra et al. argue a predominate reason for this scant research is the process of how these capabilities are created and solidified are likely to differ between new and established firms (see section 2.3.2). Table 3-3 highlights these differences:

Table 3-3: Dynamic Capabilities in New Ventures versus Established Companies

Dimension	New Ventures	Established Companies
Configuration and attributes of DC (number, scope, complexity, stability)	• Few • Focussed • Simple then complex • Rapidly Changing	• Many • Broad • Complex then simple • Resistant to change
Triggers/speed for the development and use of DC	• Increasing integration skills, recent execution failures, opportunities in previously underexplored areas, and major changes in demands from customers • Development, use likely follows vary rapidly upon event; changes sometimes dramatic	• Presence of integration skills, recent repeated execution failures, and major changes in the competitive landscape whereby competitors have leapfrogged the firm's technology or features • Development, use occurs after a significant gap following changed circumstances; changes rarely dramatic
Primary method(s) for discovering and developing DC	• Trial-and-error • Improvisation • Imitation	• Learning from experience • Planned change, experimentation • Imitation
Capability upgrading	• Learning is based on action more than planning • A key goal is filling major gaps in the firm's existing capability portfolio to explore opportunities for organic growth	• Deliberate, with an emergent quality • The focus is on building dynamic capabilities that both leverage what the firm is already doing while stretching it competence basis

Source: Zahra et al. (2006: 941)

Since Autio and colleagues (Autio et al. 2000; Autio, 2005) initial discussion on the theoretical potential of dynamic capabilities, a number of conceptual interpretations have emerged within the context of INVs (Sapienza et al. 2006; Weerawardena et al. 2007; Zettinig and Benson-Rea, 2008; Prange and Verdier, 2011; Prashantham and Floyd, 2012). Nevertheless, despite this conceptual research, to the author's knowledge, only a handful of empirical studies actually examine dynamic capabilities in INVs (e.g. Knight and Cavusgil, 2004; Mort and Weerawardena, 2006; Zhou et al. 2010; Lu et al. 2010; Autio et al. 2011; Eriksson et al. 2014). By contrast, conceptual (Luo, 2000; Birkinshaw and Pedersen, 2001; Dunning and Lundan, 2010; Pitelis and Teece, 2010) and early empirical (Griffith and Harvey, 2001; Luo, 2002; Uhlenbruck, 2004; Lee and Slater, 2007; Malik, 2008) research on dynamic capabilities in MNEs is more widespread. Dunning and Lundan (2010) for

example argue the institutional underpinnings of the MNE is not only consistent with the dynamic capabilities perspective, but serves to highlight the unique role of organisational routines that are locally embedded but mobile across borders. In addition to this research, Pitelis and Teece (2010) argue that the dynamic capabilities paradigm offers the most promise for an entrepreneurial theory of the MNE.

However, Zahra et al. (2006) initial arguments continue to make traction within INV research (Sapienza et al. 2006; Autio et al. 2010; Prashantham and Floyd, 2012). Conversely, Mudambi and Zahra (2007) emphasise INVs are actually the perfect conceptual and empirical setting to conduct dynamic capabilities research since they are knowledge intensive organisations that must continuously adapt and learn from rapid technological change. Relatedly, Sapienza et al. (2006) infer INVs are an interesting context to examine dynamic capabilities as established theories take an overly positive view on the effects on firm performance, but do not consider their potential threats to survival. Given this thesis uses Helfat et al. (2007) asset orchestration perspective (see section 2.4) as a theoretical lens, the following sections will explore whether INVs develop and deploy dynamic capabilities to create, extend and modify their resource base.

3.4.1 Creation of INV Resource Base

Research indicates that INVs can use dynamic capabilities to create new resources and capabilities, which contributes to increasing the probability of survival and growth (Sapienza et al. 2006; Weerawardena et al. 2007; Prashantham and Floyd, 2012). Therefore, Zahra et al. (2006) argues that dynamic capabilities is a useful perspective for entrepreneurship research, but the configuration of such capabilities differ in established firms and new ventures. That is, Table 3-3 indicates established firms have many "complex" routines that operate across organisational functions, while new ventures exhibit a few "simple" routines, which focus on specific organisational functions. Thus, the authors propose established firms are more likely to utilise dynamic capabilities to reconfigure existing capabilities, while new ventures are more likely to use dynamic capabilities to create new capabilities.

Zahra et al. (2006) thus argues organisational learning is likely to differ in established firms and new ventures in which the former mainly engages in experimentation (e.g. deliberate and codified procedures), while the latter are more improvisational and engage in trial-and-error learning. Sapienza et al. (2006: 916) thus argue that INVs "import" established routines from the TMTs previous experience, which reduces the costs of improvisation, decreases the

time to exploit opportunities, and improves their overall strategic and network position. In advancing this research, Prashantham and Floyd (2012) utilise Feldman and Pentland's (2003) micro-level routine assumptions to examine capability development in INVs. Central to their argument is variability in the performative aspect of routines (i.e. improvisational learning) is associated with new capability development, while variability in the ostensive aspect of routines (i.e. trail-and-error learning) is associated with existing capability improvement. The authors also contend the degree of psychic distance between the new venture's domestic market and new international markets moderate the relationship between the variability of routines and capability learning outcomes.

Despite this conceptual research, few empirical studies investigate how new ventures use their dynamic capabilities to create *new* capabilities in international markets (Zhou e al, 2010; Autio et al. 2011). In Zhou et al. (2010) the authors empirically investigate how INVs utilise "capability upgrading" to mediate the relationship between their "entrepreneurial proclivity" (i.e. proactiveness, risk-taking, and innovative behaviour) and their learning advantages of newness, which helps stimulate superior performance. The authors argue that Luo's (2000) initial research on capability upgrading suggests this learning mechanism is crucial in the creation of new capabilities, which facilitates international expansion (2010: 886). Central to their findings, is "network capability upgrading" and "knowledge capability upgrading" are essential dynamic capabilities for an INV's rapid growth. The authors also report knowledge capability upgrading provides INVs with situation-specific, precise, and up-to-date foreign market knowledge, while network capability upgrading provides firms with access to superior knowledge that improves learning advantages of newness and maximises international sales growth (2010: 887-889).Autio et al. (2011) emphasises the empirical challenges of operationalizing capability development in INVs. In this study, the authors argue that routine based definitions (e.g. Winter, 2003) are more relevant to established firms as they assume "deliberate intent" and "planned outcomes." Instead, the authors propose a broader lens that observes "new, ancillary, modified, and non-repetitive processes that might be built into a capability." (2011: 18). The authors argue that the term process provides more conceptual impetus than routine, as every routine is a process, but not every process is a routine. Central to their qualitative findings, is successful INVs develop a "language of organizing" in which the TMT uses unique cognitive processes (e.g. a shared vocabulary) to create new capabilities that effectively respond to highly uncertain situations associated with environmental change (2011: 28). The authors also build on George's (2005) initial findings and argue INVs can "learn to be capable" by leveraging their heterogeneous

experiences. The authors argue that INVs can learn to expand the "diversity" and improve the "dexterity" by which they create and execute their processes (2011: 30). Thus, including non-formalised and non-repetitive processes into a *routine* – empowers researchers to examine the timing and uncertainty of how INVs begin create new capabilities for subsequent growth.

3.4.2 Extension of INV Resource Base

Deeds et al. (2000) argue the asset accumulation process (i.e. resource extension) is critical for the development of dynamic capabilities in high technology new ventures. In IE research, few studies (if any) specifically examine how INVs build and/or utilise their dynamic capabilities to extend investment in specific asset stocks, yet some studies do discuss the importance of "capability building" for NVI (e.g. Weerawardena et al. 2007; Lu et al. 2010). Chang (1995) emphasises that "capability building" is core to IB research, as it underpins the process by which firms become MNEs through FDI. Interestingly, Chang (1995: 388) was early to propose the integration of Johanson and Vahlne (1977) and Teece et al. (1990) frameworks to examine how MNEs build capabilities by extending investment in overseas operations. However, in INVs, resource extension is likely to differ due to Oviatt and McDougall's (1994) original contention that most young firms will initially invest in non-equity modes such as trade and contractual alliances opposed to FDI. Consequently, Weerawardena et al. (2007) propose the international orientation of the founder(s) [rather than FDI] triggers resource extension, since born-globals utilise their dynamic capabilities to invest in cutting-edge knowledge intensive products, which subsequently accelerates internationalisation.

Interestingly, Karra et al. (2008) examines the international entrepreneur's dynamic capabilities and argue these "entrepreneurial capabilities" support the creation of successful INVs[4]. In this case-based research, the authors argue IE is not only about outward (and inward) early internationalisation, but involves building long-term competitive advantage through investment in complex international resource configurations (2008: 441). Thus, the authors argue founders that focus on building entrepreneurial capabilities in (1) international opportunity identification; (2) institutional bridging; and (3) cross-cultural collaboration are more likely to enable their INVs achieve unique resource configurations. Moreover, the

[4] In entrepreneurship research, there is also emerging consensus that new venture creation is a process of dynamic capability development (e.g. Newbert, 2005; Corner and Wu, 2011).

authors find focal entrepreneurs that use institutional bridging and cross-cultural collaboration capabilities are more likely to identify and exploit international opportunities. That is, the authors propose the accumulation of social (e.g. local buying behaviour) and cultural (e.g. local norms and practices) knowledge leads to the development of an institutional bridging capability, while the capacity to develop complex foreign exchange relationships with value-chain partners develops a cross-cultural collaboration capability (2008: 448). Thus, the authors report the capacity to interpret and assimilate knowledge from across the international network, much of which is tacit and culturally specific, is a key skill for international entrepreneurs.

Consequently, Zahra and colleagues (Zahra and Hayton, 2008; Newey and Zahra, 2009) empirically report on the link between absorptive capacity and dynamic capabilities within IE and entrepreneurship research. For example, Zahra and Hayton (2008) empirically find that absorptive capacity moderates the relationship between international venturing and the firm's profitability and revenue growth. Thus, the authors find an increase in absorptive capacity encourages INVs to invest in their R&D and innovative capabilities that subsequently provides wider access to foreign entry modes, which facilitates international expansion (2008: 198). Newey and Zahra (2009) also introduce "value network absorptive capacity" (VN-ACAP) from their inductive research, in which they argue absorptive capacity increases within value networks (e.g. Christensen and Raynor, 2003) that focus on inter-organisational NPD. Thus, the authors find that biotechnology new ventures that increase their VN-ACAP with pharmaceutical MNEs are more likely to build a "product portfolio planning" dynamic capability in high-velocity markets, which supports the reconfiguration of operationally focussed NPD capabilities (2009: 91).

Thus, this review indicates the majority of IE and entrepreneurship research that consider the role of resource extension focus on NPD as a particular type of dynamic capability (e.g. Deeds et al. 2000; Weerawardena et al. 2007; Newey and Zahra, 2009; Corner and Wu, 2011). However, Prange and Verdier (2011) propose that multiple dynamic capabilities underpin INV survival and growth. Moreover, most IE research uses the early dynamic capability perspectives (e.g. Teece et al. 1997; Eisenhardt and Martin, 2000) as a lens, which means these studies primarily investigate how INVs modify their resource base. The following section will therefore examine studies that provide insight into how INVs modify their resource base.

3.4.3 Modification of INV Resource Base

Research indicates that INVs can build and deploy dynamic capabilities to modify their resource base particularly in response to rapid technological change (Autio, 2005; Zahra, 2005; Sapienza et al. 2006; Weerawardena et al. 2007; Prashantham and Floyd, 2012). Zahra et al. (2006) emphasise that established firms utilise dynamic capabilities to modify their resource base, but the nature of strategic change is often incremental with the goal to achieve realignment opposed to transformation. Whereas, the authors argues that technology new ventures are more likely to use dynamic capabilities to seize opportunities through the implementation of revolutionary change that often results in transformational outcomes. Indeed, within the IE research, various conceptual articles adopt different perspectives on the nature of INVs dynamic capabilities in terms of the resource modification process. Similar to section 2.3, it appears that most INV studies differ with respect to nature of dynamic capabilities and type of strategic change they expect to achieve.

Weerawardena et al. (2007) for example propose INVs build dynamic capabilities in internationalisation, technological learning, and networking to implement radical change. Thus, INVs build dynamic capabilities in high-velocity markets that require the development of cutting-edge knowledge intensive products to accelerate internationalisation (2007: 299). Whereas, other conceptual studies (e.g. Sapienza et al. 2006; Zettinig and Benson-Rea, 2008) view dynamic capabilities as means for INVs to achieve adaptation within foreign markets. Sapienza et al. (2006) for example propose that INVs with an early exposure to multiple foreign markets will encounter a stronger "imprinting" effect where they develop specialised capabilities for rapid adaptation to the external environment. Central to their argument is age at initiation, managerial experience, and resource fungibility moderate internationalisation outcomes as it decreases the negative effects on the probability of survival, but simultaneously increases the positive effects on the probability of firm growth (2006:195). Zettinig and Benson-Rea (2008) also support Sapienza et al. (2006) view on adaptation and argue INVs develop "superior adaptability" from the exploitation of existing knowledge to help achieve long-run survival. Thus, the authors argue that dynamic capabilities support the continuous renewal of INVs resource base (2008: 358).

Empirically, it is evident most INV research on dynamic capabilities views them as a source of adaptation opposed to revolutionary change (Knight and Cavusgil, 2004; Jantunen et al. 2005; Lu et al. 2010; Autio et al. 2011). For example, Knight and Cavusgil (2004) use

evolutionary theory (i.e. Nelson and Winter, 1982) to propose how born-globals use innovation to achieve superior performance. Central to their argument, is dynamic capabilities are rooted in the firm's organisational culture which supports the adaptation of business strategy that delivers unique products that have a superior technical and quality focus, which can be distributed through multiple foreign channels. Moreover, Jantunen et al. (2005: 236) empirically find the international orientation of the entrepreneur and the INVs dynamic capability to reconfigure its resource base, constitute a core source of international performance. In addition to this research, Lu et al. (2010) investigates INVs "adaptive capability" as a mediating link between resources and international performance, who find that adaptive capability allows firms to coordinate, recombine, and allocate resources to meet multiple foreign market requirements. Thus, the authors find dynamic capabilities that focus on adaptation are a vital source of INV competitive advantage, which leads to superior performance (2010: 432).

Prange and Verdier (2011) address these differing opinions and propose INVs seek to build four types of dynamic capabilities during early internationalisation. That is, the authors propose the "international exploitation" process results in *building* "threshold" and "consolidation" dynamic capabilities, while the "international exploration" process results in the *creation* of "value-adding" and "disruption" dynamic capabilities (2011: 127). Central to their argument is international exploitation process is akin with views on adaptation in which INVs use threshold capabilities to incorporate the use of existing resources in new foreign markets (e.g. replication) while consolidation capabilities support the continuous renewal of resources in response to foreign market opportunities (2011: 128). By contrast, the authors argue international exploration is akin with transformational change, in which international entrepreneurs exhibit value-adding capabilities that support the redeployment of existing capabilities to exploit new opportunities, while INVs disruption capabilities prevent lock-in as the recombination of resources supports the discovery of radical innovation (2011: 128). Thus, on close examination it is evident that INVs exhibit multiple resource modification processes, which are important elements for dynamic capability development.

3.5 Conclusion

In conclusion, this chapter reviews literature that sheds light on the capability development process within INVs. After an initial review, it is evident INVs are a unique organisational

form, which differ from MNEs. That is, INVs rely on alternative governance structures, capitalise on foreign location advantages, and leverage unique resources such as their "learning advantages of newness" to sustain long-term competitive advantage. However, this chapter supports Autio and colleagues (Autio et al. 2000; Autio, 2005; Sapienza et al. 2006) view that Johanson and Vahlne's process theory compliments Oviatt and McDougall's new venture theory of internationalisation, particularly with respect to understanding how new ventures build capabilities for early internationalisation. This chapter then examines Oviatt and McDougall (2005) and Johanson and Vahlne's (2009) recent reconceptualisations to investigate capability development in NVI. This literature review indicates the development of internationalisation capabilities is multifaceted, in which the process and new venture theories indicate that NVI is a process of capability development. Subsequently, this review indicates that technological and managerial capabilities are vital for the NVI process.

This chapter then reviews literature that explores the development and deployment of dynamic capabilities in NVI. This review indicates that dynamic capabilities are imperative for NVI as they facilitate the creation, extension, and modification of INVs resource base. Moreover, research indicates dynamic capabilities research is likely to differ in INVs in comparison to MNEs, as INVs have few routines and predominately focus on the creation of new capabilities, opposed to the modification of existing capabilities. Moreover, this review also indicates that resource extension is likely to differ between MNEs and INVs, as the former is likely to focus on FDI, whereas the latter view focusses on the international entrepreneur's capabilities that supports the creation of an INVs resource base. Consequently, this review also argues the "sustainable INVs" encounter a process of dynamic capability development. Therefore, in accordance with Zahra (2005), it appears IE and the INV more specifically, is an interesting context to conduct dynamic capabilities research, which should help advance this strategic management agenda.

Finally, this chapter reviews research on resource modification, which leads to the finding that opinion varies on whether INVs dynamic capabilities are a source of adaptation (e.g. Lu et al. 2006) or revolutionary change (e.g. Weerawardena et al. 2007). Consequently, Prange and Verdier (2011) propose that both dynamic capability views are important in the modification of INVs resource base. Nevertheless, it is important to emphasise that most INVs lack critical resources and must create and build these capabilities from their limited resource base. Sapienza et al. (2006: 919) thus notes due to low survival rates, INVs need to develop *internal processes* such as the routines required for coordination of activities within

the organisation, and *external processes*, such as the routines to develop market-related capabilities or relationships with other organisations. Thus, these authors indicate dynamic capability research on what INVs "do and the resources they control, including the social capital they and their managers have amassed" would be "enlightening" to advance future research (2006: 930). Chapter 4 and 5 will therefore review networking and social capital, as they are fundamental within the overall theoretical framework of this thesis

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4 – Networking and Social Capital: A Theoretical Overview

Chapter Aim

To review the networking and social capital literature to shed light on the capability building process within new venture internationalisation.

Chapter Objectives

- **To review networking and social capital research that contributes to the entrepreneurial network literature.**
- **To review studies that use a capabilities lens to examine the networking behaviour of international new ventures.**
- **To review dynamic capabilities research that explores the building of networking capabilities in new venture internationalisation.**

4.1 Introduction

This chapter aims to review the networking and social capital literature to shed light on the capability building process within NVI. This chapter therefore intends to achieve three objectives. Firstly, this chapter will review the networking and social capital literature that underpins entrepreneurial network research. Hite and Hesterly (2001: 276) note that since network vocabulary is "unfamiliar" for most strategy and entrepreneurship scholars, this section will review the major networking and social capital concepts that are most prominent in entrepreneurship research. Secondly, this chapter will review studies that use a capabilities lens to examine the networking behaviour of INVs. Since this thesis assumes that early internationalisation is a process of dynamic capability development, this objective will aim to shed light on the emerging view that networking is also a process of capability development. Finally, this chapter reviews dynamic capabilities research that specifically explores the building of "networking capabilities" in NVI. This chapter will therefore provide a theoretical overview of networking and social capital that will inform the subsequent arguments made in this thesis.

4.2 Networking and Social Capital – Theoretical Foundations

Networking and social capital are critical factors in both entrepreneurship (Slotte-Kock and Coviello, 2010; Jack et al. 2010) and IE (Coviello, 2006; Prashantham and Dhanaraj, 2010) research. In Curran et al. (1993: 13) the authors recognise much of the initial theorising and research using the concepts of a "network" and "networking" are "conceptually and methodologically poorly realised." This has meant various entrepreneurship scholars emphasise that networks and networking are distinct constructs (Curran et al. 1993; Chell and Baines, 2000; O'Donnell, 2004; Neergaard, 2005; Shaw, 2006). O'Donnell (2004: 375) for example underscore, "it is not the existence of the network *per se*, but rather the use of that network through a process of networking, from which benefits accrue." This distinction is also apparent in Freytag and Ritter (2005: 644) who argue it is not a question of managing a network, but managing *in* networks, thus it is "more appropriate to talk about networking, influencing, and interacting, i.e. processes instead of outcomes."

Johannisson and Mønsted (1997: 128) argue the "unique features of networks are associated more with process than structure, so the verb form *networking* seems more appropriate and substantiates the use of the network metaphor as a generic conceptual tool for studying entrepreneurship." Thus it is evident the process of networking and the network should be

analysed as "two separate but interdependent constructs, where the latter is the outcome of the former" (Tang, 2011: 375). Despite its importance, few scholars define the networking concept. In studies that define "networking" it is apparent opinion varies on the concept's overall nature and purpose. Table 4-1 lists the most notable networking definitions within the entrepreneurship literature. In inspecting these definitions it is evident there is considerable debate on whether networking is an individual or firm-level concept and whether its core purpose is to access external resources (Watson, 2007), build long-term relationships (Chen and Chen, 1998), share ideas (Soh, 2003) or encapsulates a combination of these objectives (Gilmore and Carson, 1999).

Consequently, Brüderl and Preisendörfer (1998) emphasise networking in entrepreneurship research has emerged through two separate perspectives. The first approach pertains to the individual entrepreneur's personal network and the second approach concentrates on the entrepreneurial firm's inter-organisational network. O'Donnell et al. (2001) emphasise the overall approach of each entrepreneurial network study is mainly dependent on the level of analysis (i.e. type of actor) investigated. Whether the actor is an individual entrepreneur or entrepreneurial firm influences the research on the network. For example, O'Donnell et al. (2001: 750) note studies that investigate the entrepreneur's personal network are typically rooted in "social network" theory, while studies on the firm's inter-organisational network inform "business network" theory. Anderson and Jack (2002: 193) therefore argue that social capital (Nahapiet and Ghoshal, 1998; Adler and Kwon, 2002) is a useful "umbrella concept" that encapsulates the most important aspects of entrepreneurial network research.

Table 4-1: Networking Definitions

Authors	Networking Definitions	LoA		Purpose		
		E	F	A	S	LT
Jarillo (1989)	"'Networking' is a system by which entrepreneurs can tap resources that are "external" to them, i.e., that they don't control. In its simplest form, networking consists of the use of all personal relationships to obtain advice, financing, "insider" sales, etc. In its most sophisticated form, entrepreneurs set up an elaborate web of relationships between companies, most of them similar entrepreneurial characteristics, that are extremely efficient and flexible at delivering a product or service." (pg.133)		●	●		●
Dubini and Aldrich (1991)	"'Networking," by contrast refers to the expectation that many times both parties are investing in a long-term relation. [Thus] *"Networking" involves expanding one's circle of trust."* (pg. 307-308)	●	●			●
Cromie and Birley (1992)	"Networking is primarily a social activity. It involves the developing of a relationship between two people which is built, in part, upon mutual trust and upon a base of common experience or knowledge." (pg. 242)	●			●	●
Ramachandran and Ramnarayan (1993)	"Efficient and effective networking therefore helps to accelerate the rate of creation of new enterprises. Networking is primarily a means of raising required resources" (pg. 515)		●	●		
Zhao and Aram (1995)	"[Networking] lies with the function of resource acquisition from external sources for the new or young firm and the entrepreneur's actions in developing and managing these relationships successfully'. 'strategic entrepreneurial networking as a purposeful activity by entrepreneurs to "obtain a competitive advantage for their firms"' (pg. 351- 352)		●	●		●
Chen and Chen (1998)	"Networking among Taiwanese firms encompasses non-contractual transactions based on inter-personal links and trust which goes beyond pure business relationships" (pg. 450)	●				●
Gilmore and Carson (1999)	"Networking refers to the actual process of liaison with contacts within the network; it is about individuals and companies working alongside each other and cooperating through the exchange of ideas, knowledge and technology" (pg. 31)	●	●	●	●	●
Chell & Baines (2000)	"Networking denotes the action by which an owner-manager develops and maintains contacts for trading and business development purposes" (pg. 196)	●		●		●
Soh (2003)	"networking describes the entrepreneurial behaviour in building relationships with an expectation to develop mutual trust and reciprocity in the network of firms" (pg. 729)	●		●	●	●
Neergaard (2005)	"Networking activities undertaken by founding team members include building the new venture team, raising capital, recruitment, finding customers/outlets, obtaining access to relevant advice/knowledge and establishing international contacts" (pg. 262)		●	●		●
Miller et al (2007)	"networking theory focusses on the development of trusting and reciprocal relationships among independent business owners as a tactical stance in competitive markets" (pg. 634)	●				●
Watson (2007)	"networking can provide the means by which small and medium enterprise (SME) owners can tap needed resources that are 'external' to the firm" (pg. 853)	●		●		
Tang (2011)	"Networking behaviours are interpreted to represent the directions and actions of firms in formulating, developing and maintaining network relationships" (pg. 375)		●			●
Key: **LoA:** Level of Analysis; **E**: Entrepreneur; **F**: Firm; **A**: Access to external resources; **S**: Sharing of information; **LT**: Long-term relationship						

Source: The Author

Nahapiet and Ghoshal (1998: 243) define social capital as "the sum of resources embedded within, available through, and derived from the network of relationships by an individual or social unit." Social capital is rooted in Pierre Bourdieu's (1986) original research that has spawned wide debate from Coleman (1988), Burt (1992) and Putnam (1995: 8), but there is general agreement within social science that social capital represents "the ability of actors to secure benefits by virtue of membership in social networks or other social structures" (Portes, 1998: 6). Adler and Kwon (2002) also note there are numerous social capital perspectives within management research, but generally researchers adopt an "internal" (i.e. Coleman, 1988) or "external" (i.e. Burt, 1992) approach, while some scholars attempt to combine these perspectives (i.e. Nahapiet and Ghoshal, 1998). Payne et al. (2011: 492) thus argue researchers "have failed to fully recognise that social capital can have alternative meanings, antecedents, and consequences at different levels [of analysis]."

However, Adler and Kwon (2002) build on Nahapiet and Ghoshal's (1998) integrative attempts and distinguish between the "sources" and "effects" of social capital. Thus, the authors define "social capital is the goodwill available to individuals or groups. Its sources lies in the structure and content of actor's social relations. Its effects flow from the information, influence, and solidarity it makes available to the actor" (2002: 23). In entrepreneurship research, these social capital conceptualisations for the founding, survival and growth of entrepreneurial firms is now widely acknowledged (Davidsson and Honig, 2003; Florin et al. 2003; Kim and Aldrich, 2005; Myint et al. 2005; Anderson et al. 2007). These studies therefore adopt Nahapiet and Ghoshal's (1998) seminal conceptualisation in which they discuss the (1) structural, (2) relational, and (3) cognitive dimensions of social capital as a useful organising framework. Maurer and Ebers (2006: 263) also state that Nahapiet and Ghoshal (1998) is a "reasonably comprehensive conceptualisation" that "accommodates the major concerns of the extant literature."

Anderson and Jack (2002: 193) borrow from Powell and Smith-Doerr's (1994) analogy of "glue and lubricant" to articulate the value of social capital in entrepreneurial networks. The authors specify social capital is both the "glue" that binds network structure and the "lubricant" which facilitates social interaction within the entrepreneurial network. Moreover, Watson (2007: 855) emphasises that networking is a process that enhances an entrepreneurial actor's social capital. Since social capital is an intangible asset (Pennings et al. 1998), scholars therefore attempt to understand the "amount of social capital" which is

embedded in an entrepreneurial firm's network of relationships (Yli-Renko et al. 2001; Liao and Welsch, 2005; Maurer and Ebers, 2006).

Table 4-2: The Value of Social Capital in Entrepreneurial Networks

The construction of social capital	Emphasis	Analytic category	Key questions
The nature of social capital	Process	Entrepreneurial networks	What is it? How can we conceptualise it?
As a glue	Bonding (Structure)	Creation of relationships	How is it formed? Ends or means?
As a lubricant	Facilitating (Relational)	Interaction with relationships	How is it maintained? Is it purely exploitative? Are there rules?

Source: Anderson and Jack (2002:199)

This analogy is useful as increasing the quantity of glue and lubricant conceptually enhances the amount of social capital that embeds a network relationship. Thus, echoing Gilmore and Carson (1999), networking involves the process of increasing the quantity of glue and lubricant to form and forge long-term productive relationships. Networking therefore involves the process of enhancing the value of a firm's social capital (Watson, 2007). To measure the value of social capital researchers can then examine the sources and effects of its structural, relational, and cognitive dimensions (Adler and Kwon, 2002; Nahapiet and Ghoshal, 1998). Thus, the prime objective of this section is to review the networking and social capital research that contributes to the entrepreneurial network literature. Since social capital is a highly fluid but valuable concept, each of these dimensions will now be discussed to gain further insight into the overall process and outcomes of networking by entrepreneurial firms.

4.2.1 Structural Social Capital

The structural dimension of social capital focusses on the advantages conferred by the configuration of an actor's network of contacts (Moran, 2005: 1132). Nahapiet and Ghoshal, (1998: 244) note structural social capital is based on Granovetter's (1992) discussion on "structural embeddedness" which refers to the overall pattern of connections between actors – that is, who you reach, and how you reach them (Burt, 1992). Structural social capital thus encapsulates "the impersonal configuration of linkages between people or units" (Nahapiet and Ghoshal, 1998: 244). The authors specify the sources of structural social capital are in the (1) presence or absence of "network ties" between actors, (2) the "network configuration" and (3) "appropriable organisation" which is the multiplexity of the network in that its creation for one purpose may be used for other purposes.

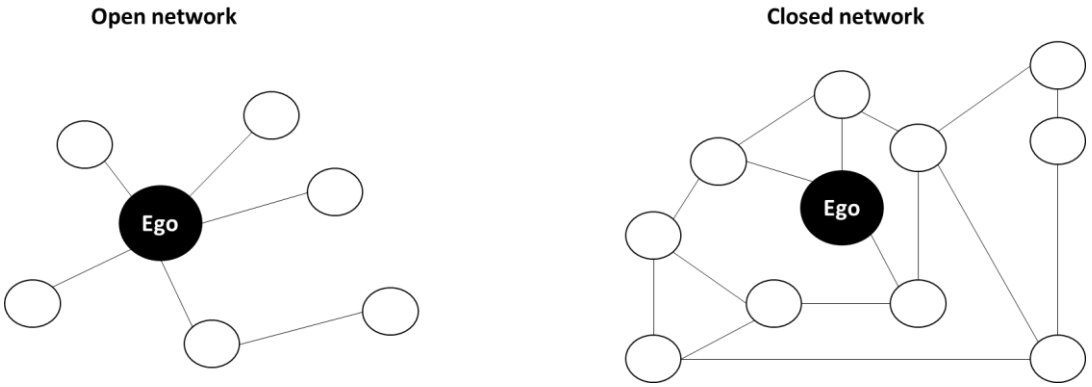
Jack et al. (2010) notes to understand the complexity of networking, scholars must initially understand the structure of the "entrepreneurial network." Davern (1997: 288) note the fundamental components of any network are "nodes" and "connections" while in the social sciences, researchers normally replace nodes with "actors" and connections with "ties" or "bonds." Social network theory thus defines network structure as "the pattern of direct and indirect ties between actors" (Hoang and Antoncic, 2003: 170). Shane and Cable (2002: 367) thus define a "direct tie" as "a personal relationship between a decision maker and the party about whom the decision is being made." Relatedly, they define an "indirect tie" as "a relationship between two individuals who are not directly connected but through whom a connection can be made through a social network of each party's direct ties" (2000: 367). Lin et al. (2001) also argues that direct and indirect ties comprise of a firms structural social capital, which provide access to a diverse range of information and resources.

At the individual-level, direct ties are the individual entrepreneur's personal network of family, friends, and acquaintances who provide access to early stage resources at the start-up phase (Larson, 1992; Ostgaard and Birley, 1994). Whereas, indirect ties are advantageous for entrepreneurs who seek to obtain unique resources from their distant network (Shane and Cable, 2002). At the firm level, Gulati (1995) argues indirect ties are important for focal firms who need to access unique resources that are only available through direct ties. In these situations, focal firms can leverage trust they have built with direct ties and reinforce their position when a forming new alliances with indirect ties. As a result, access to unique resources is available through a social interaction process with various network contacts who embed a focal actor's overall social structure (Tsai and Ghoshal, 1998).

Jack (2010) emphasises studies which investigate the network configuration of new ventures have largely been based on Coleman (1988) and Burt's (1992) influential contributions on social capital. These studies have fuelled major debate on whether advantages stem from cohesive or sparsely structured entrepreneurial networks. On one side of the debate, Coleman (1988) argues that "network cohesion" is characterised by a dense and closed network structure that offer the most advantages to firms. Whereas, Burt (1992) argues "structural holes" are more advantageous to firms that involved in sparse and loosely connected network structures. Figure 4-1 presents these opposing views have resulted in what social capital theorists describe as "bonding" [closed] and "bridging" [open] social capital (Gittell and Vidal, 1998; Leonard, 2004).

Bonding social capital is primarily associated with Coleman's (1988) theory on network cohesion. Coleman (1988) argues there are numerous benefits from a dense group of actors who have known each other for a long time and interact frequently. Bhagavatula et al. (2010) for example argues cohesive networks are beneficial for new ventures as it allows information to be transmit quickly to all group members involved, which helps save valuable time and energy. Cohesive networks also facilitate exchange of fine-grained information, which tends to be tacit, complex or proprietary (Uzzi, 1997; Hansen, 1999; Reagans and McEvily, 2003). Another benefit of a cohesive network is the values of the group are clearly, although implicitly, defined, which in turn ensures a higher level of trust and reciprocity between the members of the network (Bhagavatula et al. 2010).

Figure 4-1: Open and Closed Networks



Source: Andersson et al. (2005: 34)

According to Echols and Tsai (2005), cohesive networks discourage opportunistic behaviour and ensure inappropriate behaviour is dealt with through sanctions imposed by actors within the network. Cohesive networks then offer a mechanism to lubricate economic transactions, which warrants smooth and fair interactions within a minimal regulatory framework (Bhagavatula et al. 2010). A cohesive network is therefore an informal governance mechanism that protects entrepreneurs against various forms of opportunistic behaviour such as withholding information (Uzzi, 1997), belittlement (Fleming et al. 2007) and malfeasance (Yu et al. 2011). Steier and Greenwood (2000) also argue once entrepreneurs become established within a cohesive network, it is possible to minimise interaction with all actors and still access new information from closer members within the group.

Bridging social capital in contrast focusses on Burt's (1992) structural holes theory that emphasises the importance of gaps within a focal actor's social structure. Burt (1992) argues

the benefit of social capital stems from non-redundant ties, or more specifically, from the absence of ties among those to whom one is connected (i.e. structural holes). Structural holes are then the gaps within a focal actor's social structure that consequently provides brokerage opportunities to access non-redundant (i.e. diverse) sources of information and resources (Moran, 2005: 1331). Oh et al. (2006) note these brokerage opportunities normally occur in sparse networks of weak ties where many actors remain unconnected. Bridging ties intend to span structural holes by linking a focal firm to distant contacts in economic, professional, and social circles that are not otherwise accessible by the firm (McEvily and Zaheer, 1999).

Burt (1992) argues (1) access, (2) timing, and the (3) referral of potentially valuable information are the main benefits to emerge from a non-redundant network rich in structural holes. Since actors have limits on the amount of information they can absorb (Cohen and Levinthal, 1990), Burt (1992) argues structural holes provide access to new and diverse information that would otherwise be unobtainable through a closed network. The size and diversity of a network also influences the timing of which a focal actor receives superior information. For example, if entrepreneurs enjoy a central position within a strategically valuable network, they are more likely to receive superior information earlier and faster than rivals (Hallen, 2008). Brokerage opportunities also help increase innovation and firm performance. For example, Maula et al. (2003) found that technology start-ups who build bridges over diverse social cleavages are more likely to accrue increased knowledge and learning benefits. Koka and Prescott (2002) also identify firms that are restricted by the competitiveness of their home markets can exploit brokerage opportunities across national borders to accrue greater resource control.

Despite this research, brokerage has been criticised as being a predominately "individualist" theory (Batjargal, 2003; Xiao and Tsui, 2007). For example, Batjargal (2003) empirically finds that Russian entrepreneurs found brokerage less effective due to the reputational risks of leaving a cohesive network. Xiao and Tsui (2007: 23) also argue that the assumptions of brokerage are less compatible for collectivist cultures. In their empirical study, the authors investigate Chinese high-technology firms and find brokerage does not fit with collectivist values of China. Instead, the authors argue cohesiveness and high-commitment are more favourable with respect to personal career development. Flemming et al. (2007) therefore argues there are costs and benefits from both brokerage and closure and finding an "optimal network configuration" is actually contingent on many relational and cognitive attributes. An awareness of these "structural" costs and benefits are then more likely to help

entrepreneurial ventures with "efficient" tie creation (Hallen, 2008; Hallen and Eisenhardt, 2012).

4.2.2 Relational Social Capital

The relational dimension of social capital focusses on the role of direct ties between actors and the relational, as opposed to structural, outcomes of interactions (Inkpen and Tsang, 2005). Rooted in Granovetter's (1992) notion of "relational embeddedness" this dimension refers to the "quality" of dyadic relationships opposed to the network structure in which these ties are configured. Relational social capital thus encapsulates the "personal relationships people have developed with each other through a history of interactions" (Nahapiet and Ghoshal, 1998: 244). The authors specify the most important facets of this dimension include (1) trust (Putnam, 1995); (2) norms (Coleman, 1990); (3) obligations and expectations (Bourdieu, 1986); and (4) "identification" (Simon and Davies, 1996). Put simply, although the structure of an actor's network may provide access to several ties who offer potentially valuable resources, personal experience and the quality of past interactions will influence whom the actor is likely to approach and engage with (Moran, 2005). Thus, Uzzi and Gillespie (2002) note two actors may occupy equivalent network positions but if their personal and emotional attachments to other network members differ, their behaviours and performance are likely to differ.

The relational dimension of social capital is a bonding mechanism that supports entrepreneurial firms lubricate and strengthen the relationships they hold with other actors (Jack and Anderson, 2002). In Granovetter's (1973) seminal study, he explains the strength of ties within a network defines the strength and quality of relations. Theoretically, tie strength is a continuous measure, ranging from having no relationship (two actors are strangers) through passing acquaintance (weak tie) to building a strong relational tie (Kim and Aldrich, 2005). Granovetter (1973) emphasises tie strength can be broken down into four dimensions: (1) the time spent in a relationship; (2) the emotional intensity; (3) the intimacy of mutual confiding; and (4) the degree of reciprocity between two actors. Newbert et al. (2013) explains weak ties tend to be short-term superficial relations that are characterised by infrequent interaction and exchange, while strong ties tend to be long-standing relationships based on frequent contact and high levels of obligation. Strong ties therefore form between entrepreneurial firms and long-standing business partners' who has

shared norms and a successful history of cooperative exchange guide interactions (Elfring and Hulsink, 2003).

It is widely acknowledged that trust is a fundamental source of relational social capital (Nahapiet and Ghoshal, 1998; Adler and Kwon, 2002; Inkpen and Tsang, 2005; Lee, 2009). In its simplest form, Barney and Hansen (1994: 176) refer to Sabel (1993) and define trust as "the mutual confidence that no party to an exchange will exploit another's vulnerabilities." Johanson and Vahlne (2009: 7) refer to the work of Morgan and Hunt (1994) and define trust as "the ability to predict another's behaviour." Barney and Hansen (1994: 176) also emphasise that "trust" and "trustworthiness" are distinct concepts. That is, the authors explain that trust resides *within* a relationship between exchange partners, while trustworthiness is an attribute of an individual exchange partner. Put differently, trust is a shared asset built *during* the development of a relationship, while trustworthiness is an attribute, each actor will or should earn *after* a successful relational exchange (Doney and Cannon, 1997; Dyer and Chu, 2003). Despite these distinctions, Ring (1996: 150) argues the literature tends to treat trust as a "unitary concept" and provides scant understanding on the processes that create trust or on how actors rely on trust to govern economic exchange.

In the cooperative strategy (Dyer and Singh, 1998) and entrepreneurship (Hoang and Antoncic, 2003) literature, trust is a distinctive governance mechanism in the development of relationships. This literature argues that firms manage inter-organisational relations through either contractual (Williamson, 1979; Hennart, 1988) or relational (Zaheer and Venkatraman, 1995; Dyer and Singh, 1998; Rousseau et al. 1998) forms of governance. The former perspective is firmly rooted in TCE (Williamson, 1985) and argues formal contracts minimise the assumed threat of a partner's opportunistic behaviour. By contrast, the latter perspective is rooted in social exchange theory (Blau, 1964) which assumes partners tend to behave in a trustworthy manner, meaning relationships are self-governed by trust, especially when there is a history of successful collaboration. Alder (2001) however argues there is still confusion as to how trust can be broken down into various dimensions and components.

One exemplar is Ring (1996) who reviews the above literature and identifies there are varying levels of trust which fulfil different management functions. In this study, Ring (1996: 152) distinguishes between "fragile trust" and "resilient trust" on the basis that "predictability" and "vulnerability" are very different attitudes towards building trust. In the first approach, the author argues the ability to predict another actor's behaviour equates with

risk and is akin with Williamson's (1993) notion of calculative trust. This calculated approach is "fragile" as trust bases upon the way actors characterise a contractual deal, rather than how actors characterise each other. In contrast, resilient trust does not rest in the predictability of outcomes, but in the belief in the goodwill of others (Ring and Van de Ven, 1992). Ring (1996) argues resilient trust is non-calculative, but reliant on the integrity, loyalty, openness and discretion of each actor to express their vulnerabilities when building a relationship. In line with McAllister (1995) this trust is affection based meaning it will survive even when actors make occasional mishaps since it is rooted with interpersonal care and concern. Trust is then weaker when based on predictability and stronger when based on the benevolence of actors (Ring, 1996).

Adler and Kwon (2002: 23) emphasise "the goodwill available to individuals or groups" indicates that the vulnerability aspect of trust is a fundamental and prolonged source of relational social capital. Adler (2001) emphasises norms (Putnam, 1995) are an important source of trust and determine what bonding actions are appropriate in certain relationships. Peng et al. (2008) indicates norms encapsulate the values, rules, beliefs, and actions of other actors' which together influence how a focal actor behaves in various institutional settings. For example, research has found the creation and development of long-term relations is more likely to occur when actors either enjoy kinship ties, or are both geographically and culturally localised (Alvesson and Lindkvist, 1993). Uzzi (1997) also found relationships embedded with trust, norms and reciprocity create a willingness to share fine-grained information within locally dense inter-family networks. Adler and Kwon (2002) argue "solidarity" is then a major benefit to derive from strong social norms and beliefs as they encourage compliance with local rules and customs that reduce the need for formal contracts. Norms therefore facilitate the exchange and early access of complex information, which are major benefits that emerge from this source of relational social capital (Inkpen and Tsang, 2005).

A strong reputation is also a central source for building trust, and a major benefit of relational social capital (Adler, 2001; Adler and Kwon, 2002). Jones et al. (1997: 932) define an actor's reputation as an "estimation of one's character, skills, reliability, and other attributes important to exchange." Whereas, Shane and Cable (2002: 370) simply define an entrepreneur's reputation as "information about an individual's past performance." Entrepreneurship scholars therefore emphasise a good reputation is an effective means of overcoming the liability of newness, building trust and increasing firm performance (Larson, 1992; Stuart et al. 1999; Lechner et al. 2006). Stuart et al. (1999) for example found

biotechnology new ventures that receive endorsement from high profile ties such as alliance partners, investors, and board members achieved greater initial public offering (IPO) valuations than those without such acknowledgement. In IE research, Zahra and George (2002) emphasise that a good reputation within an entrepreneurial network provides greater access to foreign market opportunities. A strong reputation thus accelerates trust and helps entrepreneurial firms achieve high status and legitimacy that are major benefits for high-potential new ventures (Packalen, 2007).

It is evident that trust is the overarching source of relational social capital (Inkpen and Tsang, 2005). In Adler (2001: 218) he identifies the underlying "bases" of trust are: (1) consistency in behaviour; (2) competence to perform tasks; (3) benevolence, loyalty, concern, and goodwill; (4) honesty and integrity; and (5) openness. Adler et al. (1999) also emphasise the role of goal congruence to identify trust. When actors meet these principles, a major effect of trust is the development of commitment that is the willingness and endured desire to maintain a valued relationship (Moorman et al. 1992). Morgan and Hunt (1994) emphasise commitment is the actor's belief and choice to invest in a relationship with the view to maintaining its long-term development. In entrepreneurship research, scholars including Larson (1992), De Clercq and Sapienza (2006) and Mosey and Wright (2007) all acknowledge that trust and partner commitment are critical elements which enhance the quality of resource flows. Trust is therefore a prerequisite of commitment (Morgan and Hunt, 1994), which means long-term commitment is a considerable effect to emerge from trust which together indicate the relational value of social capital (Adler and Kwon, 2002; Johanson and Vahlne, 2009).

4.2.3 Cognitive Social Capital

The cognitive dimension of social capital represents those resources providing shared meaning and understanding between the network members (Nahapiet and Ghoshal, 1998: 244). In extending this conceptualisation, Inkpen and Tsang (2005) identify that (1) shared goals and (2) shared culture are the two fundamental sources that underpin cognitive social capital. Although cognition is increasingly researched in strategic management (Tripsas and Gavetti, 2000), international business (Sullivan, 1998) and entrepreneurship (Mitchell et al. 2002), network-based research has had a tendency to neglect and overshadow this topic (Inkpen and Tsang, 2005). Indeed, De Carolis and Saparito (2006: 4) argue there is a significant gap in the literature related to links between cognitive social capital and

entrepreneurial behaviour. Lee and Jones (2008) also stress entrepreneurship scholars should become more acquainted with the cognitive aspect of social capital.

Tsai and Ghoshal (1998: 467) argue cognitive social capital is rooted in a "shared vision [which] embodies the collective goals and aspirations of the members of the organization." These "shared goals" represent the degree to which network members share a common understanding and approach to the achievement of network tasks and outcomes (Inkpen and Tsang, 2005: 153). When a shared vision is present within the network, actors have a similar perception as to how they should interact with one another that promotes mutual understanding and exchange of ideas and resources (Tsai and Ghoshal, 1998). Thus, Inkpen and Tsang (2005) argue a shared vision is a "bonding mechanism" that stimulates relational exchange. Nevertheless, when actors have inconsistent goals, inter-partner conflict is likely to arise (Schnake and Cochran, 1985). For example, Eisenhardt and Schoonhoven (1996) found when entrepreneurial firms form strategic alliances with incumbents, both actor's often have varying goals but are rarely communicated which often means these relations break down. Whereas, when objectives of strategic alliances are clearly stated, a common understanding and likelihood of alliance success is likely to emerge (Das and Teng, 1998).

Inkpen and Tsang (2005: 153) argue the second major source of cognitive social capital is a shared culture that "refers to the degree to which norms of behaviour govern relationships." In network-based research, Gulati et al. (2000: 205) note this facet is similar to the concept of "tie modality" (Galaskiewicz and Zaheer, 1999), which is "the set of institutionalised rules and norms that govern appropriate behaviour in the network. These are sometimes spelled out in formal contracts, most often they are simply understandings that evolve within the dyad of the network." In IB research, the role of national (Hofstede, 1994) and organisational culture (Kogut and Singh, 1988; Ghoshal and Bartlett, 1990) on inter-firm relations has been researched extensively through institutional based frameworks. For example, Parkhe (1991) have found cultural diversity between partners can lead to learning benefits, while Lei et al. (1997) have found alliances that transfer tacit knowledge are often ineffective in circumstances when partners belong to diverse cultural contexts.

For new ventures, Liao and Welsch (2005) emphasise when actors participate in networks that share norms and beliefs, they are more likely to develop trustful relationships through the successful exchange of information and resources. These authors also emphasise Ouchi (1980: 138) who state that: "Common values and beliefs provide the harmony of interests

that erase the possibility of opportunistic behaviour." The network concept of "homophily" (McPherson et al. 2001; Ruef et al. 2003) which is the tendency to work or interact with people of similar interests is therefore an important aspect of cognitive social capital. Ruef et al (2003: 197) for example investigates the composition of entrepreneurial start-up teams and found gender and ethnicity were core homophily mechanisms as individuals often share a common identity, values, beliefs and norms. Whereas at inter-firm level, Milanov and Fernhaber (2009: 49) draw on the homophily principal to argue the position of an initial alliance partner may imprint the new venture's future network position, and determine the path-dependent network context within which the new venture grows and forms its own future partnerships. Shared norms and beliefs are therefore important sources of cognitive social capital (Inkpen and Tsang, 2005).

Shared language is a fundamental attribute that underpins a "shared culture" and is an important source of cognitive social capital (Inkpen and Tsang, 2005). Bolino et al. (2002) note when shared language and narratives exist, actors can more easily discuss problems, transfer ideas, share knowledge, and offer more effective assistance to one another. In IE research, a shared language provides actors with the ability to communicate more effectively across national borders (Oviatt and McDougall, 2005). Vissa (2011: 142) for example discusses the importance of shared language in supporting Indian entrepreneurs with forming new ties. Due to India's cultural diversity, entrepreneurs who are able to communicate in the language of new contacts found it easier to establish new contacts as they were able to determine whether they shared norms, values, and taken-for-granted cultural assumptions which are difficult to gauge without conversation. Additionally, research on ethnic entrepreneurship has shown poor English proficiency in the US constrains tie formation and information exchange for first generation immigrant entrepreneurs (Aldrich and Waldinger, 1990).

Chen and Chen (1998: 450) note cultural and ethnic bonds are particularly useful for making networking linkages and penetrating institutional markets where cross-border operations are yet to be established. The cultural and socially embedded nature of Chinese *guanxi* networks are one example which exhibit intensive levels of cognitive social capital (Park and Luo, 2001; Batjargal and Liu, 2004). Guanxi deeply embeds Chinese culture and means "relationships that bind people through the exchange of favours" (Todeva, 2006: 166). Park and Luo (2001) argue Chinese firms develop guanxi as a strategic mechanism to overcome competitive and resource disadvantages by cooperating and reciprocating favours with

competitive forces and government institutions. Tsang (1998) notes a major distinction of guanxi networks is their ability to grow beyond the family enterprise and expand into economic activities within the wider community. For new ventures that enter China, having rich cognitive social capital with Chinese relations is then a fundamental asset for navigating the complexity of guanxi networks (Batjargal and Liu, 2004; Fu et al. 2006). Cognitive social capital is therefore a highly important asset for new ventures who need to traverse through institutionally distant markets (Bhagavatula et al. 2010; Prashantham and Dhanaraj, 2010).

An entrepreneur's cognitive biases may also provide additional insight into the networking processes that enhance cognitive social capital (De Carolis and Saparito, 2006). Lee and Jones (2008: 559) for example found nascent entrepreneurs create cognitive social capital with new actors via face-to-face and electronic forms of communication. However, entrepreneurs who are less skilled in building rapport electronically (e.g. through email and teleconferencing) were unable to create cognitive social capital which limited their opportunity to obtain business backing including emotional support, information, advice, equipment and referrals. The nature of cognitive social capital then indicates *why* the development of network relations are complex and certainly not linear (Staber, 2006). Bolino et al. (2002) therefore argue higher levels of cognitive social capital provide actors with a common perspective that enables them to perceive and interpret events in similar ways. Echoing Johannisson (1986: 20), the enhancement of [cognitive social capital] is a skilful form of networking which provides entrepreneurial firms with the ability to navigate the "institutional jungle." Entrepreneurs who utilise similar language, codes, and narratives then "lubricate" their cognitive social capital that provides shared understanding during interaction (Lee and Jones, 2008).

Prashantham and Floyd (2012) also argue that [cognitive] social capital arising from network relationships supports INVs overcome the negative effects of psychic distance that inhibit capability development. Moreover, the authors argue relational capabilities enable INV learning in high psychic distance contexts (2012: 13). Indeed, Blyler and Coff (2003: 679) were early to propose that a firms "social capital is an essential component of a dynamic capability in that it enables resource management." Since then a significant stream of literature has emerged that uses a dynamic capabilities as a theoretical lens to examine various aspects of relational and network management. Given this thesis argues that networking is a process of capability development, the following section will review the literature that sheds light on this process.

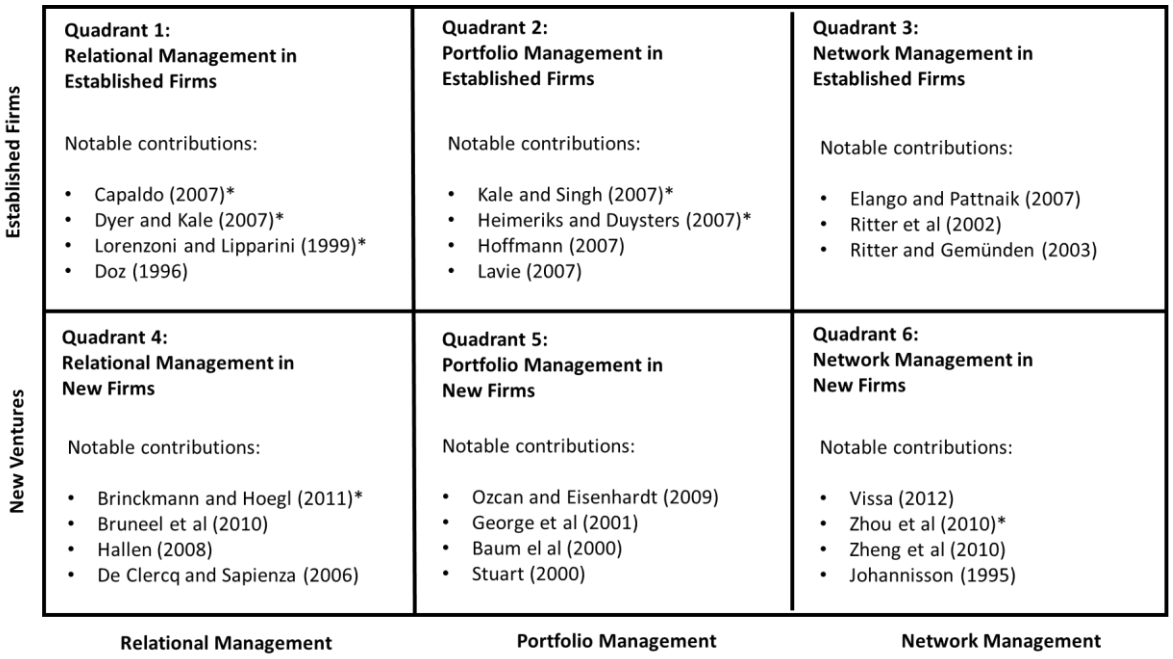
4.3 A Capabilities Perspective on Networking Behaviour

The prime objective of this section is to review studies that use a capabilities lens to examine the networking behaviour of INVs. Interestingly, numerous studies adopt a (dynamic) capabilities lens to observe and explain various aspects of a firms networking behaviour. For example, in strategic management numerous labels seek to explain networking behaviour such as, "network capabilities" (Kogut, 2000, Zaheer and Bell, 2005); "network resources" (Gulati et al. 2000; Lavie, 2006); "alliance capabilities" (Kale and Singh, 2007; Heimeriks and Duysters, 2007), "alliance management capability" (Ireland et al. 2002) and "relational capabilities" (Capaldo, 2007).

In the industrial marketing and purchasing (IMP) and IB literature, labels include, "network competence" (Ritter and Gemünden, 2003), "interaction capability" (Johnsen and Ford, 2006), "collaboration capabilities" (Blomqvist and Levy, 2006; Allred et al. 2011) and "global dynamic capability" (Griffith and Harvey, 2001). In entrepreneurship research studies on network capabilities (Walter et al. 2006), alliance management capability (Rothaermel and Deeds, 2006), relational capability (Brinckmann and Hoegl, 2011) and "innovative capability" in inter-firm networks (Zheng et al. 2010) all examine the networking behaviour of technology new ventures. Figure 4-2 thus divides this literature on six quadrants to help researchers navigate this "terminological haze" (Winter, 2000). On the horizontal axis, this study adopts Möller and Halinen's (1999) categorisation of "relational management", "portfolio management" or "network management,"[5] while on the vertical axis, this study pinpoints the research conducted in "established firms" or "new ventures."

[5] Contributions with asterisks use dynamic capabilities as a theoretical lens to examine networking behaviour.

Figure 4-2: A Capabilities Perspective on Networking Behaviour



Source: The Author

4.3.1 Relational and Alliance Capabilities

Möller and Halinen (1999) argue most researchers investigate relational management from an IMP perspective (Möller and Wilson, 1995) or strategic management (Dyer and Singh, 1998) perspective. In this research, scholars primarily concentrate on the management of dyadic exchange relationships, opposed to the management of inter-personal relationships, which is more common in entrepreneurship research (e.g. Larson and Starr, 1993). In IE research, limited studies specifically investigate the INV's management of individual network relationships as most studies concentrate on the management of social capital (Yli-Renko et al. 2002; Prashantham and Dhanaraj, 2010), or their overall network (Coviello, 2006). Bruneel et al (2010) is one exception that adopts an organisational learning framework to examine interorganisational learning during NVI. In this study, the authors empirically find INVs can substitute their limited internationalisation knowledge for interorganisational knowledge by capitalising on learning advantages of newness when collaborating with exchange partners. However, capability based research that specifically examines the relational behaviour of INVs is a major gap within the IE literature.

In the wider strategic management literature, Schreiner et al. (2009) review of the alliance capability literature (e.g. Gulati, 1998; Anand and Khanna, 2000; Kale et al. 2002) indicates

two research streams have emerged with respect to the management of alliances. The first stream focusses on *how* alliance capability develops in firms (e.g. Anand and Khanna, 2000), while the second stream investigates the individual skills and organisational routines which underpin this capability (e.g. Gulati, 1998). In the latter stream, Schreiner et al. (2009) notes that researchers examine the skills needed for alliances at two different levels. The first camp (quadrants 1 and 4) consider the skills needed to manage an individual alliance (e.g. Doz, 1996; Ireland et al. 2002) while the second camp (quadrants 2 and 5) considers the skills a firm needs to manage an entire portfolio of alliances (e.g. Hoffmann, 2007; Rothaermel and Deeds, 2006; Ozcan and Eisenhardt, 2009).

To differentiate between these levels of analysis, some researchers also use the term "relational capability" (e.g. Collins and Hitt, 2006) instead of alliance capability to examine the management of exchange relationships within an alliance network. For example, Lorenzoni and Lipparini (1999) utilise Teece et al. (1997) assumptions on dynamic capabilities to conceptualise "relational capability" as a process that leverages inter-firm relationships. Lorenzoni and Lipparini (1999: 320) position relational capability as "the measurement of a firm's capability to develop integrate, and transfer knowledge across different actors in a network." Careful examination of this definition indicates the management of multiple relations in a network, rather than the exchange relationship *per se*. Similarly, Capaldo (2007: 585) argues a firm requires a distinctive set of relational capabilities to sustain "innovativeness by creating and managing the overall architecture of its network over time." Capaldo (2007) then explicates that the management of strong and weak ties leads to the development of a distinctive relational capability, which in turn allows firms to build a "dynamic innovative capability" through their knowledge-intensive alliance network.

Dyer and Kale (2007: 79) contribute to the dynamic capabilities debate by defining a relational capability as "a type of dynamic capability that refers to the capacity of the firm to purposefully create, modify or extend the firm's resource base, augmented to include the resources of partners." Similar to Capaldo (2007) the authors argue: "relational capabilities are a precondition for firms to access the benefits from their network ties" in which they define network ties as "sets of relationships between firms that reflects their transactions with other organizations within an industry or scientific field" (2007: 66-67). Dyer and Kale (2007) thus argue firms can source advantage from their relational capabilities when their alliances have (1) complementary capabilities, (2) relationship-specific assets; (3) inter-firm

knowledge sharing routines and (4) effective governance. In other words, firms can effectively manage their alliances when there is a high degree of asset complementarity and strategic fit (Teece, 2006), the inter-firm learning that takes place is adaptable to changing needs (Zollo et al. 2002) and the alliance is governed on fair contractual terms (Hennart and Zeng, 2005).

Schreiner et al. (2009) argues this research is helpful for understanding how established firms formulate new alliances (e.g. Doz, 1996), but provides less detail on *how* firms effectively manage alliances after formation. However, in the entrepreneurship literature, the inverse is more common, as this research investigates how new ventures manage existing relationships (e.g. Larson and Starr, 1992) but few studies consider *how* entrepreneurs formulate or create new relationships. One example is Eisenhardt and Schoonhoven (1996), who were early to use the RBV as a lens to examine how new ventures form alliances when they are in a vulnerable strategic position but have a strong social position, which provides access to knowledge and new exchange relationships. In a similar vein, Baron and Markman (2003) investigate the "social competence" of individual entrepreneurs who build and extract value from their network relationships. In this study, the authors identify six networking skills (1) social perception, (2) impression management, (3) persuasiveness, (4) social adaptability, (5) expressiveness, and (6) emotional intelligence that lead to the creation of network relationships.

However, Collins and Hitt (2006) emphasise Larson's (1992) argument that social forces can blunt the entrepreneur's economic rationality when forming new exchange relationships, which means firms must build relational capabilities in order to develop relational capital. De Clercq and Sapienza (2006) is one of the few entrepreneurship studies that investigates the effects of relational capital and commitment on VCs perception of portfolio company performance. In this study, the authors empirically find that the amount of relational capital embedded in the VC-portfolio company dyad and the extent to which the VC is committed to the portfolio company strongly relates to perceived performance, and stimulates organisational learning. Arikan and McGahan (2010) empirically find that VCs are more likely to invest in young firms when they exhibit strong corporate capabilities in the implementation of pre-emptive alliance and acquisition deals. Hallen (2008) also examines the entrepreneur's ability to build exchange relations and identifies two paths on which new ventures establish ties with initial investors. One path indicates new ventures rely on the founders' existing ties and human capital to secure early investment, while the second path

illustrates some entrepreneurs will wait and leverage their organisations accomplishments before they secure initial investment.

Finally, Brinckmann and Hoegl (2011) specifically investigate the effects of relational capability on the development of technology based new ventures. Building on Capaldo (2007) the authors argue, "Relational capabilities pertain to the collaboration of the founding team members with external partners" (2011: 38). The authors focus on founding teams' relations with resource providers in the technological, marketing, and financial domain and empirically verify the strength of the founding teams' relational capabilities provide access to critical knowledge, new internal capabilities, and improves overall growth. This research then supports Hallen's (2008) empirical finding that initial tie formation is heavily path dependent and new ventures require relational capabilities to overcome the inertia that dominates overly embedded relationships. Thus, relational management is an area ripe for research within the domain of IE.

4.3.2 Alliance Portfolio Capabilities

Möller and Halinen (1999: 418) define a portfolio management capability as the "firm's competence in managing supplier and customer portfolios. It includes analytical aspects, such as competencies in creating and using databases and conducting supplier and customer evaluation, and organizational aspects, such as capabilities to develop organizational solutions for handing exchange relationships." In strategic management, scholars label this area of inquiry as alliance portfolio research (Gulati, 1998; Reuer and Ragozzino, 2006; Hoffmann, 2007; Lavie, 2007; Wassmer, 2010). Wassmer (2010) emphasises that researchers examine alliance portfolios in two ways. Firstly, some studies examine an alliance portfolio as an aggregate of all the focal firm's strategic alliances past and present (Marino et al. 2002; George et al. 2001; Lavie, 2007). Whereas, some studies grounded in the social network theory define an alliance portfolio as the a focal firm's egocentric network and specifically examine the focal firm's existing direct ties with exchange partners rather than the indirect ties of these partners (Rowley et al. 2000; Baum et al. 2000; Ozcan and Eisenhardt, 2009).

However, only a few studies use a dynamic capabilities lens to examine the management of alliance portfolios (Kale and Singh, 2007; Heimeriks and Duysters, 2007). In Kale and Singh (2007: 983), the authors build on Kale et al. (2002) and argue an established firm's alliance capability is identifiable and measurable through a dedicated alliance function that is

responsible for overseeing and coordinating the firm's alliance portfolio. The authors utilise Zollo and Winter's (2002) conceptualisation of dynamic capabilities to examine how "alliance learning" processes underpin the development of a focal firm's alliance capability. Specifically, the authors argue that "alliance learning process" is a second-order learning process that "involves articulation, codification, sharing, and internalization of alliance management know-how." (2007: 982). The authors then position "alliance learning" as a higher-order dynamic capability which is rooted in deliberate investments of second-order learning. By implication, Schreiner et al. (2009) elaborates Kale and Singh's (2007: 982) discussion infers that second-order learning (i.e. articulation and codification) should improve and modify the firm's first-order dynamic alliance capability that manages a portfolio of alliances.

Heimeriks and Duysters (2007) similarly utilise Zollo and Winter's (2002) perspective on dynamic capabilities to conduct empirical research on process of alliance capability development. Interestingly, these authors identify numerous deliberate learning mechanisms such as (1) functions; (2) tools; (3) control and management processes; and (4) external parties that underpin a focal firm's dedicated alliance function. These learning mechanisms therefore provide a more granular insight into the organisational routines that underpin a firm's alliance capability (2007: 44). However, as with the previous dynamic capability interpretations, this research is more relevant to large established firms, as Rothaermel and Deeds (2006:432) notes new ventures do not have the routines nor the resources in place to implement a dedicated alliance function.

Most entrepreneurship research that examines new venture alliance portfolios are empirically set within high-technology industries (Deeds and Hill, 1996; Baum et al. 2000; Stuart, 2000; George et al. 2001; Ozcan and Eisenhardt, 2009). Although none of these studies adopt a dynamic capabilities lens, Wassmer (2010: 147) emphasises that organisational learning is the predominate theory that underpins these contributions (e.g. Deeds and Hill, 1996; Stuart, 2000; George et al. 2001). Stuart (2000) for example finds that technology start-ups can learn from their portfolio of interorganisational alliances and use these alliances as a source of endorsement to build public confidence in the value of their products and services. In addition to this research, George et al. (2001) examines the characteristics of biotechnology start-ups alliance portfolios (i.e. the diversity of horizontal and vertical ties) and their absorptive capacity (ACAP) to find they both jointly influence performance. Specifically, the authors find the content of knowledge-flows that lubricates

ties and their ACAP are better indicators of performance than simply portfolio size. This study also empirically verifies that vertical ties positively relate to performance, while horizontal ties positively relate to patents (i.e. innovation capability) but they are not significant predictors of company performance (2001: 221).

Ozcan and Eisenhardt (2009) is also a notable contribution that challenges the traditional assumptions of alliance portfolio research. The authors argue that resource dependence (Pfeffer and Salancik, 1978) and social embeddedness (Gulati, 1995) theories typically underpin alliance-based research, which assume firms: (1) begin with superior resources and (2) commence negotiation with an established network position. Consequently, the authors argue these assumptions apply to a "rich-get-richer" view and are unclear on *how* less "well-endowed" firms build high-performing alliance portfolios (2009: 247). Ozcan and Eisenhardt (2009) thus build a process theory, which proposes the conditions on which technology start-ups originate high-performing alliance portfolios. In this framework, the authors propose when technology start-ups (1) advocate a vision of the embryonic industry architecture, (2) synchronise multiple exchange partnerships and (3) exploit industry uncertainties, they are more likely to form high-performing alliance portfolios and achieve superior performance (2009: 269-270).

Baum et al. (2000) also generate similar findings as they find biotechnology start-ups must understand and envision the composition of their alliance portfolio to avoid inter-partner conflict and rivalry between partners. Stuart (2000) also finds industry analysts look unfavourably on new ventures that have extensive, inefficient webs of alliances comprised of multiple and duplicate partners. These findings indicate that "efficient" alliance configurations – minimum costs for maximum relational benefit (e.g. Burt, 1992) – is beneficial for technology start-ups (Baum et al. 2000). However, these authors emphasise it is not clear "whether these benefits arise directly from the alliance participation or rather as second-order effects of the innovation-enhancing characteristics of alliances." (Baum et al. 2000: 287). In other words, is alliance success dependent on the actual alliance *per se*, or the firm's dynamic capability to manage a portfolio of alliances? Given that alliance portfolios of technology start-ups are highly sensitive to the effects of initial imprinting, conceptually it would seem these firms need a dynamic capability to mitigate such path dependencies, which indicates this is an important INV function.

4.3.3 Network Management Capabilities

Möller and Halinen (1999: 417-418) define a net management capability as the "firm's capability to mobilize and coordinate the resources and activities of other actors in the network. It is a necessary capability to establish and manage such value-creating nets as supplier nets, customer nets, and R&D nets. Net management capability also is manifested in a firm's actions when entering new networks, as in a foreign market entry, and it its capability of managing net positions." Network management has therefore been an important topic in IB research given the mechanisms of this capability are implicit within the network model of internationalisation (Johanson and Mattsson, 1988). Although strategic management scholars investigate firm network capabilities (e.g. Kogut, 2000; Zaheer and Bell, 2005), this area of research has gained most traction within IMP and IB research.

Ritter (1999) built the "network competence" concept and along with his colleagues (Ritter et al. 2002; Ritter and Gemünden, 2003) examine the processes of network management for innovation within knowledge-intensive industries. Ritter (1999: 471) defines network competence as "the degree of network management task execution and the degree of network management qualification possessed by people handing a company's relationships." Ritter et al. (2002: 120-121) emphasise the network competence construct consists of "task implementation" and "qualifications" as the two dimensions. The first dimension – task execution – thus consists of two elements, which are "relationship specific tasks" and "cross relational tasks." Relational tasks thus involve the management of a single relationship through initiation, exchange, and coordination processes. Cross-relational tasks thus aim to manage tasks across the focal firm's network through processes such as planning, organising, staffing, and controlling.

The second dimension – qualifications – consist of two elements, which are "specialist" and "social qualifications." Ritter and Gemünden (2003) note specialist qualifications include tasks that are necessary to handle the "technical side" of relationships. These skills include (1) technical skills to understand partners' technical needs and requirements, (2) economic skills such as negotiation and (3) experiential knowledge of managing previous relationships. Additionally, social qualifications are the "extent to which a person is able to exhibit independent, prudent, and useful behaviour in social settings" (2003: 748). Therefore, this element includes social skills such as communication ability, extraversion, conflict management skills, empathy, emotional stability, self-reflectiveness, sense of justice

and cooperativeness (2003: 748). Overall, the authors argue the degree of a focal firms network competence is a two dimensional construct which consists of the (1) the degree of network management task execution and (2) the extent of network management qualifications possessed by the people handling the firms network of relationships (Ritter and Gemünden, 2003).

Möller (2006) notes network management research mainly investigates large established firms such as MNEs parental and foreign subsidiary networks (e.g. Elango and Pattnaik, 2007). Whereas, in the entrepreneurship literature, the majority of studies that investigate network management examine the "skills" of the individual entrepreneur to manage their personal contact network (Johannisson, 1995; Gilmore and Carson, 1999; Vissa, 2012). However, in some entrepreneurship studies such as Walter et al. (2006) and Zheng et al. (2010) they examine the network capabilities of technology based new ventures and emphasise the importance of coordination, market knowledge, communication, and status when managing an evolving network of relationships. In IE research, Zhou et al. (2010) is one notable contribution that examines the INV's network capability upgrading function and finds that this capability mediates the relationship between its entrepreneurial proclivity (i.e. proactiveness, risk-taking and innovativeness) and its learning-advantages of newness. In other words, this study finds INVs that are proactive in seeking network capabilities often have a better chance of selecting reliable foreign partners, nurturing their relationships effectively, and acquiring up-to-date knowledge for improving performance (2010: 889). Therefore, it is evident that all of these capabilities are important within NVI research.

4.4 Networking Capabilities – A Distinctive Dynamic Capability

The prime objective of this section is to review research that uses dynamic capabilities as a lens to explore the building of networking capabilities in NVI. Given this thesis adopts Helfat et al. (2007) asset orchestration lens, this section will review networking capabilities on the premise that INVs will use such a capability to create, extend, and modify their social capital. Consequently, in Oviatt and McDougall's (1994: 61) concluding remarks, they question whether Larson's (1992) seminal research on networks is applicable for understanding what "social and economic processes and conditions promote network building across national borders?" Although section 4.3 sheds light on the capabilities of networking, few studies examine networking capabilities in NVI. Table 4-3 therefore present the existing networking capability definitions:

Table 4-3: Networking Capability Definitions

Study	Definition	Theoretical Positioning
Håkansson (1987)	"networking ability is defined as the ability of a company on one hand to strengthen its role in the network in terms of resources and activities, and on the other to manage effectively each relationship with external partners" (1987: 124)	1. Conceptual 2. N/A 3. N/A 4. IMP school 5. Business network 6. N/A
Fernhaber and McDougall (2005)	"a networking capability refers to the ability of a firm to tap external resources through the building and maintenance of relationships" (2005: 118/126)	1. Conceptual 2. N/A 3. Teece et al (1997) 4. Johannisson (2000) 5. Entrepreneurial network 6. Adaptation
Mort and Weerawardena (2006)	"we define dynamic networking capability as the capacity of the firm to develop a purposeful set of routines within its networks, resulting in the generation of new resource configurations and the firm's capacity to integrate, reconfigure, gain and release resource combinations." (2006: 558)	1. Empirical 2. Inductive 3. Eisenhardt and Martin (2000) 4. Ritter et al (2002) 5. Business network 6. Adaptation
Chen et al (2009)	"Networking capability refers to the capacity of new ventures to identify, establish, coordinate and develop relationships with different players in the market." (2009: 295)	1. Empirical 2. Deductive 3. Barney (1991) 4. Baron and Markman (2000) Ostgaard and Birley (1994) Lee et al (2001) 5. Social capital, external links, entrepreneurial network 6. Adaptation
Tolstoy and Agndal (2010)	*"network resource combination capability* incorporate (1) the ability to effectively interact with network partners, (2) the ability to identify complementarities between network resources in the overall network, and (3) the ability to proactively coordinate network resources to a specific end."	1. Empirical 2. Inductive 3. Lavie (2006) 4. Bloomstermo et al (2004) 5. Business relationships 6. Adaptation and Revolution
Key: (1) Nature of study; (2) Method; (3) Capability perspective; (4) Network perspective; (5) Level of analysis; (6) Strategic change perspective		

Source: The Author

4.4.1 Creation of Social Capital

IE research indicates that INVs can utilise their networking capabilities to create social capital (e.g. Fernhaber and McDougall, 2005; Mort and Weerawardena, 2006). For example, Milanov and Fernhaber (2009: 47) argue this emerging literature highlights that "networking skills are among the most important entrepreneurial skills that can be developed." Relatedly, they argue the "development of collaborative skills and recognition of good alliance partners are crucial already in the early stages of new venture development as the choice of the first partner may set the new venture on its networking trajectory, which is likely to be important for its future success" (2009: 47). Thus, Dubini and Aldrich (1991: 306-307) argue that: "networking can be treated like any other social skill that can be learned, involving making contacts, building relationships, and activating linkages." These authors argue "ordinary business behaviour" is distinct from "networking behaviour" in that the former is

characterised by ad-hoc market mediated transactions, while the latter has the "expectation" that two parties will invest in a long-term relationship.

In Håkansson's (1987: 124) initial discussion, he defines networking ability as "as the ability of a company on one hand to strengthen its role in the network in terms of resources and activities, and on the other to manage effectively each relationship with external partners." Therefore, unlike capability studies in Figure 4-2, Håkansson (1987: 124) was early to propose that networking behaviour combines an actor's ability to improve its overall network position (i.e. portfolio and network management) and manage individual relationships (i.e. relational management). Since then, conceptual (Fernhaber and McDougall, 2005; Weerawardena et al. 2007) and empirical (Mort and Weerawardena, 2006) research indicates that networking capabilities are vital in the creation of new relationships. Table 4-3 shows that Fernhaber and McDougall (2005: 128) argue INVs networking capabilities enhance the relationship between the new ventures adaptability and its international growth. Specifically, they argue an INV's networking capability enables firms to amass new information from their established network and to identify new exchange partners and minimise the liabilities of foreignness that impinge growth (2005: 129).

Mort and Weerawardena (2006) explore the networking capability of international entrepreneurs and argue that founders deploy these capabilities to penetrate global markets. Table 4-3 indicates that Mort and Weerawardena (2006) use Eisenhardt and Martin's (2000) dynamic capabilities perspective as a lens to conceptualise networking capability as an entrepreneurial capability that supports the creation, building, and reconfiguration of network relationships. Central to their qualitative findings is that networking capability supports INVs identify and establish new relationships that support the exploitation of foreign market opportunities. Moreover, the authors empirically find the international entrepreneurs networking capability is an entrepreneurial capability that enables INVs to acquire technological knowledge within innovation networks that subsequently facilitates the development of knowledge intensive products (2006: 564). Thus, the authors find international entrepreneurs who have "superior" networking capabilities will enable NVI, which combined with attractive products, supports superior performance (2006: 567).

Despite this research, few studies specifically examine *how* INVs create social capital. One exemplar is Arenius (2002) who in her doctoral dissertation investigates the creation of firm-level social capital and its exploitation during NVI. In this multiple-case study, the author

explore how INVs create social capital and find that individual entrepreneurs rely on their previous foreign market experience and existing network to build and exploit firm-level social capital for the purposes of NVI. Prashantham and Dhanaraj (2010) also use longitudinal case studies to explore the origins of INVs social capital. In this study, the authors find Indian "returnee entrepreneurs" who have built MNE experience, will often have higher stocks of initial social capital than their counterparts, which mean they can leverage this initial social capital to achieve early international growth. Consequently, the authors find "network learning" plays a crucial role in the new ventures ability to realise the potential contribution of its social capital in the international growth process (2010: 977). This limited research thus indicates networking capabilities are integral in the overall creation of social capital, which stimulates INV performance.

4.4.2 Extension of Social Capital

Presutti et al. (2007) emphasises the extension of specific stocks of social capital – for example the INV's largest single foreign customer – is a critical asset for NVI. Thus, the development of specific cross-border relationships (e.g. co-R&D and distribution agreements) are "landmarks" in a new ventures chronology of internationalisation, which indicates networking is path dependent since existing relationships have a strong influence on a firm's behaviour including the further extension of the network (Jones and Coviello, 2005: 290). Indeed, Jarillo (1989: 133) specifies that networking in its most simplistic form is about utilising existing personal relationships to access advice and information, while, in its most sophisticated form involves building an "elaborate web of relationships" between companies who can support a firm deliver a product or service. Kuemmerle also notes after an INV's formal creation, the entrepreneur has to strike the right balance between using the ventures existing network of contacts and augmenting network relationships further to access knowledge that fuels further growth. Consequently, Kuemmerle argues that these networking activities are difficult tasks to manage simultaneously (2002: 104).

The networking capabilities literature also acknowledges the importance of network development, but offers scant insight on how INVs invest in network relationships. For example, Table 4-3 indicates Mort and Weerawardena (2006) emphasise networking capabilities involves "building" relationships, but do not elaborate on this process. Fernhaber and McDougall (2005: 118/126) also state a "networking capability refers to the ability of a firm to tap external resources through the building and maintenance of relationships" but do

not elaborate on these specific processes. By contrast, the "network development" literature in entrepreneurship research provides greater insight into the extension of social capital (Hoang and Antoncic, 2003; Jack et al. 2008; Slotte-Kock and Coviello, 2010). Jack et al. (2010) argues the network development literature aims is to understand "network change" (Koka et al. 2006) in response to emerging entrepreneurial requirements. Thus, even though there are limited network development contributions (e.g. Butler and Hansen, 1991; Larson and Starr, 1993; Hite and Hesterly, 2001; Lechner and Dowling, 2003), research indicates this literature provide a more fine-grained understanding of *how* new ventures networking activities emerge and change through various stages of development (Milanov and Fernhaber, 2009).

For example, Larson and Starr (1993) is one seminal contribution that conceptualises entrepreneurial networking over a three-stage process. The authors argue exchange relationships transform from a set of relatively simply dyadic exchanges into a dense set of stable, multidimensional, and multi-layered interorganisational relationships. Their conceptual model describes three successive stages of networking activity which support new ventures secure critical economic and non-economic resources. These activities are: (1) focussing on essential dyads; (2) then converting dyadic ties to socioeconomic exchanges; and finally (3) layering these exchanges with multiple exchange processes. Smith and Lohrke (2008) explain Larson and Starr's (1993) model was one of the first to specify that networking involves the selection, addition and deletion of ties as the entrepreneurial firm determines which resource providers are most critical for early expansion. Hoang and Antoncic also argue that Larson and Starr's model is "the most complete piece of theorizing about network process in the entrepreneurial context" (2003: 179).

In IB research, Johanson and Mattson's (1988) initial theory on "network extension" provides insight into how international firms extend investment in social capital. The authors argue that firms internationalise through three modes of networking in order to establish a network position with relation to its foreign counterparts (Johanson and Mattsson, 1988: 296). Thus, they argue "early starters" internationalise through a process of "international extension" by building trust and commitment with export agents or distributors who have the market knowledge and distribution capability to sell the Early Starter's products (1988: 299-300). Indeed, Chetty and Campbell-Hunt (2004) note the early starter has clear conceptual overlaps with INVs, since as these firms increase their involvement in international markets, they are likely to become "lonely internationals" and use their foreign

experience and resources to penetrate the local market by integrating its cross-border activities. Johanson and Vahlne (2009) thus argue the extension of a firm's network position is a core skill that international firms must learn and they specify that Coviello (2006) is one of few IB studies that successfully achieve this aim.

Interestingly, Coviello (2006) empirically examines the evolution of INV networks. Coviello argues that INVs do not build relationships in the conventional manner, as she finds they initially increase the diversity of their network (i.e. bridging social capital), which consequently decreases their network density (i.e. bonding social capital). As a result, Coviello proposes this networking activity extends early-stage INVs social capital. Therefore, the author proposes INV growth parallels an evolving network position, as long-term investments in specific stocks of social capital provide access to new international growth opportunities (2006: 725). Coviello also finds that investment in INV networks differ to Larson and Starr's (1993) original theory that proposes entrepreneurial networks evolve in a conventional and stabilised manner. Instead, Coviello empirically finds that INV networks are volatile and long-term investment is limited to only a few strategically important relationships (2006: 726). Thus, this research leads to the assumption that an INV's networking capability predominately supports the modification of social capital, which is the focus of the final section.

4.4.3 Modification of Social Capital

Conceptual (Fernhaber and McDougall, 2005; Weerawardena et al. 2007) and empirical (Mort and Weerawardena, 2006; Tolstoy and Agndal, 2010) research indicates INVs can deploy their networking capabilities to modify their social capital. Indeed, one criticism of the social capital literature is most contributions make overly positive assumptions on its asset value, and overlook the potential liability of specific investments (Adler and Kwon, 2002; Batjargal and Liu, 2004). Thus, some entrepreneurship (Uzzi, 1997; Burt, 2005; Maurer and Ebers, 2006) and IE (Prashantham and Dhanaraj, 2010) research identifies the "dark side" of emerging networks and report on the deprecation of over and under-investment in social capital. For example, empirical research has found that network relationships that exhibit a lack of trust (Neergaard, 2005), social interaction (Yli-Renko et al. 2001), shared vision (De Carolis and Saparito, 2006) and common language (Bolino et al. 2002) all inhibit new venture growth and performance. Relatedly, Yu et al. (2011: 429)

argue that INVs must continuously modify their social capital since "network cohesion could create a deadly competency trap."

Mort and Weerawardena (2006) thus argue INVs must build a networking capability to prevent "network rigidity" which limits strategic choices with respect to early and rapid internationalisation. Thus, Mort and Weerawardena argue INVs that develop a purposeful set of resource reconfiguration routines by "adding" and "deleting" social capital allows firms to overcome network rigidity and accelerate international speed (2006: 567). Prashantham and Dhanaraj (2010) also report that the "decay" of INV social capital in MNE strategic alliances inhibits NVI, particularly within technology led industries. Consequently, Hite and Hesterly's (2001) seminal conceptualisation provides insight on how new ventures adapt their evolving network. Central to Hite and Hesterly's argument is new venture networks are initially "identify-based" as they are cohesive and composed of socially embedded ties. However, as the new venture expands, it will adapt is network through a sparse "calculative" structure where it strategically evaluates the economic costs and benefits of adding or removing certain ties. Thus, Hite and Hesterly infer network development is initially path dependent, but as the firm builds [networking] capability, it will begin to "strategically manage" its network (2001: 279).

Table 4-3 indicates opinion varies on whether INVs use networking capabilities as an incremental or radical way to modify social capital. For example, Fernhaber and McDougall (2005: 119) argue that INVs utilise networking capabilities as a source of adaptation to uncover unexplored knowledge that resides with the ventures network of relationships. Similarly, Chen et al. (2009) empirically find that Chinese technology new ventures with a strong networking capability combined with strong technological and financial capabilities are more likely to engage in alliance and acquisition activity during internationalisation. Thus, implicit in the authors' findings is the "continuous realignment" of its foreign partnerships improves the probability of a new ventures survival and growth (2009: 301). Consequently, these views indicate networking capabilities support INVs with strategic renewal of their social capital, and when information becomes redundant, the firm has the choice to extend or "retrench" this social capital.

By contrast, some interpretations view networking as a source of revolutionary change (e.g. Mort and Weerawardena, Ritala et al. 2009; Ozcan and Eisenhardt, 2009; Tolstoy and Agndal, 2010). For example, Mort and Weerawardena (2006) build on Eisenhardt and

Martin (2000) and assume that INVs use their networking capability in high-velocity markets to reconfigure their network in order to deliver cutting-edge knowledge intensive products. By contrast, Tolstoy and Agndal (2010) use Lavie's (2006) network resources framework to examine six biotechnology ventures that operate in foreign markets. In this study, the authors categorise INVs on whether they introduce existing products in new foreign markets (new international market ventures) or introduce new products in existing foreign markets (new international product ventures). Central to their findings is new international product ventures build a "network resource combination capability" to exploit a broad set of network resources to address the multi-faceted challenges associated with redefining the product and market (2010: 33). Thus, innovation in entrepreneurial networks are central to these conceptualisations.

Consequently, these interpretations overlap with research on the "orchestration" of innovation networks (Dhanaraj and Parkhe, 2006; Ritala et al. 2009; Ozcan and Eisenhardt, 2009; Nambisan and Sawhney, 2011). Dhanaraj and Parkhe (2006) propose orchestration in innovation networks focusses on the "hub firms" (i.e. focal firm) ability to orchestrate and exploit network centric innovation. Ritala et al. (2009: 571) thus define an orchestration capability as the firm's ability to "purposefully build and manage inter-firm innovation networks." Nambisan and Sawhney (2011) argue a focal firm's network orchestration involves the challenge of initially designing an industry architecture (i.e. Ozcan and Eisenhardt, 2009) and managing the network as partners begin to use the platform. In addition to this research, Dhanaraj and Parkhe (2006) note among the challenges the orchestrator faces is the imperative of enhancing knowledge mobility amongst the network, whilst policing opportunism, misappropriation, free riding and ensuring network stability. The technology new venture's ability to modify its social capital is then critical in high-velocity markets that undergo radical change (Maurer and Ebers, 2006; Koka et al. 2006). Thus, this research indicates that networking capabilities have various functions, but are central for INVs that seek to modify their social capital.

4.5 Conclusion

In conclusion, this chapter reviews the networking and social capital literature to shed light on the capability building process within NVI. Firstly, it is evident considerable debate exists on whether networking is an individual or firm-level concept and whether its core purpose is to access external resources (Watson, 2007), build long-term relationships (Chen and

Chen, 1998), share ideas (Soh, 2003) or encapsulates a combination (Gilmore and Carson, 1999) of these objectives. Based on this review the author defines *networking as the process of forming and strengthening ties through the exchange of information and resources to advance each actor's long-term development*. This definition encapsulates the major arguments that networking is: (1) an entrepreneurial behaviour; (2) an individual and firm-level activity; (3) helps form new and strengthen existing ties; (3) functions through the exchange of information and; (5) seeks to build long-term relationships. After reviewing Nahapiet and Ghoshal's (1998) structural, relational, and cognitive dimensions of social capital, the author adopts the view these three dimensions are indicators of the amount of social capital that is embedded in each network relationship (Yli-Renko et al. 2001). Therefore, in line with Watson (2007) this study argues the central purpose of networking is to enhance an entrepreneurial actor's social capital.

This chapter then reviews studies that use a capabilities lens to examine the networking behaviour of INVs. Interestingly, numerous capability interpretations of networking have emerged within the strategic management and entrepreneurship literature at various levels of analysis in established firms and new ventures. Figure 4-2 thus divides this literature on six quadrants, which illustrates most dynamic capability studies on networking occur in large established firms (e.g. Capaldo, 2007; Kale and Singh, 2007). Whereas, there are few new venture studies that use dynamic capabilities to examine networking behaviour (Zhou et al. 2010; Brinckmann and Hoegl, 2011). Moreover, this review indicates most new venture studies address various aspects of networking such as management of individual exchange relationships (e.g. De Clercq and Sapienza, 2006), alliance portfolios (e.g. Baum et al. 2000), inter-personal (Vissa, 2012) or inter-firm (e.g. Zheng et al. 2010) ties. This review thus indicates these capability studies are inconsistent and address various aspects of networking behaviour.

Finally, this chapter reviews dynamic capabilities research that explores the building of networking capabilities in NVI. This section outlines that Håkansson's (1987) initial research on networking capabilities have emerged as a useful lens to explore how firms manage individual relationships as well as strengthen its overall position within a network. However, this review highlights that networking capability studies take different perspectives on how firms create, extend, or modify social capital. Table 4-3 highlights that each networking capability study uses a different a theoretical lens and examines networking at various levels of analysis. For example, some studies examine the role of networking

capabilities in entrepreneurial networks (e.g. Fernhaber and McDougall, 2005) while others examine their influence in business networks (e.g. Mort and Weerawardena, 2006). More importantly, this review finds various types of networking capability facilitate the creation, extension, and modification of social capital. This review also indicates networking capability studies either assume they seek to realign (e.g. Chen et al. 2009) or transform (e.g. Tolstoy and Agndal, 2010) INV social capital. Given this diversity, it is clear this area is ripe for further research.

5 - Problem Statement and Conceptualisation

Chapter Aim

To present the aim, objectives, research questions of this thesis in order to conceptualise the problem that motivates this research.

Chapter Objectives

- **To present a research problem statement that justifies this research.**
- **To outline the working thesis statement that guides and informs this subsequent empirical research.**
- **To present the overall aim, objectives, and theoretical framework that underpins this research.**

5.1 Introduction

This chapter aims to present the aim, objectives, and research questions of this thesis in order to conceptualise the problem that motivates this research. This chapter therefore intends to achieve three objectives. Firstly, this chapter will present the research problem that justifies this research. Secondly, this chapter will outline the working thesis statement that informs and guides this subsequent empirical research. Thirdly, this chapter will present the overall aim, objectives, and theoretical framework that underpins this research. This chapter will then conclude by summarising the research problem that drives this research.

5.2 Problem Statement

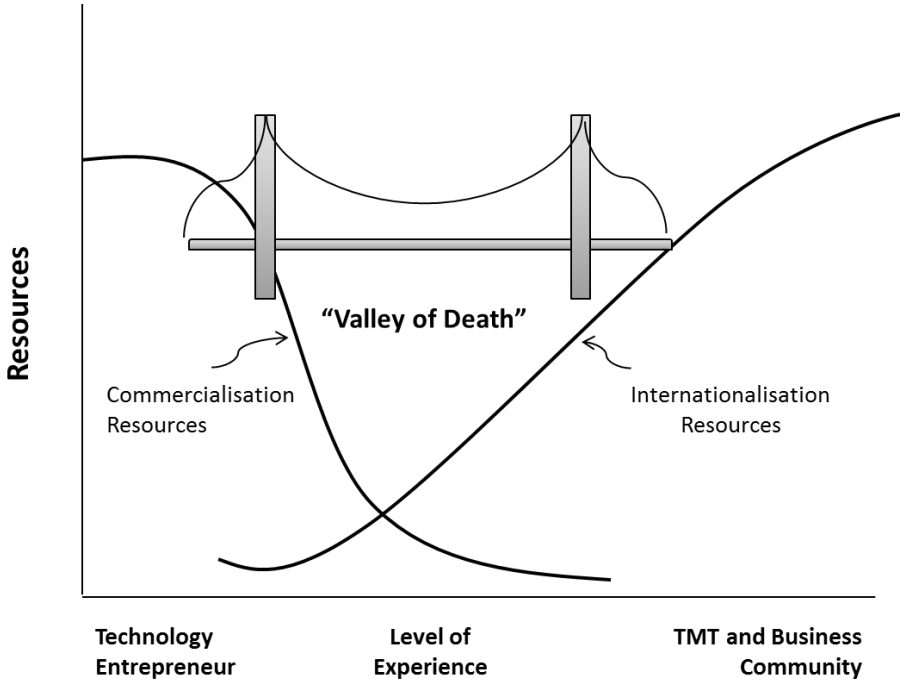
The major problem that drives this research is the observation in Chapter 3 that most technology start-ups are resource constrained, and do not have sufficient managerial, technological and financial capabilities to compete in international markets (Jolly et al. 1991; Shrader et al. 2000; Crick and Jones, 2000). Galbraith (1982) for example was early to discuss the "typical" growth stages that technology new ventures encounter, which include: (1) proof of principle/prototype, (2) model shop, (3) start-up, (4) natural growth, and (5) strategic manoeuvring. Thus, the crux of Galbraith's argument is inexorable problems occur in technology start-ups because entrepreneurs "do not think stagewise" and do not build the necessary capabilities to execute new phases of development (1982: 70). Additionally, Kazanjian (1988) empirically builds on Galbraith's research and finds that technology based new ventures encounter dominant problems at the (1) conception and development, (2) commercialisation, (3) growth, and (4) stability stages. Thus, marshalling financial resource is a primary concern at invention (i.e. prototyping) and commercialisation (i.e. NPD) stage, while production, distribution, market-share, and diversification problems dominate the growth and stability stages (Kazanjian and Drazin, 1990).

However, Mudambi and Zahra (2007) note despite advances in ICT, the reduced cost of travel and increased market access to emerging economies, research continues to find that most technology new ventures still end in failure. A central reason for low-survival rates is most "technology entrepreneurs" (i.e. those with science and engineering backgrounds) struggle to cross the "valley of death" as they do not have the experience or resources to launch a commercial venture (Auerswald and Branscomb, 2003). Barr et al. (2009: 371) notes the "valley of death" is the "institutional, financial and skill gap" between R&D and commercial application. Thus, the authors argue the missing link in a technology

entrepreneur's efforts is when essential start-up costs such as R&D absorb the new ventures initial commercialisation resources (e.g. seed capital) and prevent the creation of a compelling new market driven business (2009: 371). Section 3.3.1 indicates that the founder(s) of most INVs typically have science and engineering backgrounds, but often lack experiential knowledge of internationalisation which is often more critical than access to financial capital alone (Preece et al. 1997; Kuemmerle, 2002).

Section 3.3.3 thus indicates that an early stage entrepreneurial team (McDougall et al. 2003), formalised TMT (Reuber and Fischer, 1997) and board of directors (Bloodgood et al. 1996) are all instrumental for NVI. However, Shrader and Siegel (2007) note that most technology entrepreneurs are unable to recruit an experienced TMT until their NPD has reached a certain phase of development. Thus, technology new ventures face the paradox of surviving the "valley of death" on scant commercialisation resources as they face the imperative of learning how to exploit their emerging technology in underdeveloped markets that have brief windows of commercial opportunity (Barr et al. 2009). Fernhaber and McDougall-Covin (2009) thus note entrepreneurs must quickly build legitimacy in the business community to raise venture capital, which enables NVI. However, these ventures face a "double-edged sword" as resource constraints inhibit the speed of NPD, which consequently inhibits the speed of formalising an internationally experienced TMT (Deeds et al. 2000; Bonardo et al. 2010). Figure 5-1 thus illustrates the challenge technology entrepreneurs encounter as they attempt to cross the valley of death before subsequent aid of a TMT and business community.

Figure 5-1: The Valley of Death – Bridging the Gap between Technology and Commercial Application



Source: Adapted from Barr et al. (2009: 371)

Chapter 3 and 4 therefore argues that networking (Dubini and Aldrich, 1991; Watson, 2007) and social capital (Yli-Renko et al. 2002; Presutti et al. 2007) compensates for the resource constraints that inhibit NVI. However, Mosey and Wright (2007) emphasise that most technology entrepreneurs focus on building scientific networks and do not have the skills or capabilities to create or manage a valuable commercial network of relationships. Empirical research has also found when technology new ventures have access to business networks, the founder(s) are often unable to exploit the commercial opportunities or recognise the threats that embed this industry specific social capital (Maurer and Ebers, 2006; Prashantham and Dhanaraj, 2010). Interestingly, Dubini and Aldrich (1991: 312) were early to specify that it is "critical to investigate how an extended network is created, developed, and strengthened over time, and how an entrepreneur manages to embed the concept of personal network in the company's "culture" so that the company itself becomes "network oriented." Nevertheless, despite this research problem, few studies examine *how* technology start-ups create, manage, or modify an evolving network of relationships.

Therefore, Chapter 4 elaborates that such INVs need to build dynamic capabilities in networking to overcome these growth challenges. Indeed, the general dynamic capabilities

literature (see section 3.4) and with reference to networking (see section 4.3) indicates most interpretations focus on large firms and assume they begin with an established resource and/or network position. However, recent criticism of the dynamic capabilities (e.g. Autio et al. 2011) and networking (e.g. Ozcan and Eisenhardt, 2009) literature have led entrepreneurship scholars to argue that these established theories do not reflect the entrepreneurial behaviour of these technology new ventures. Moreover, section 4.4 reviews IE research on networking capabilities (e.g. Fernhaber and McDougall, 2005; Mort and Weerawardena, 2006; Tolstoy and Agndal, 2010), which provides various interpretations on the importance of these capabilities on NVI. Nevertheless, although these interpretations (see Table 4-3) seek to describe *what* networking capabilities are, they are less clear on *how* they develop over time, and *why* certain processes enable or inhibit NVI. Thus the major research problem is:

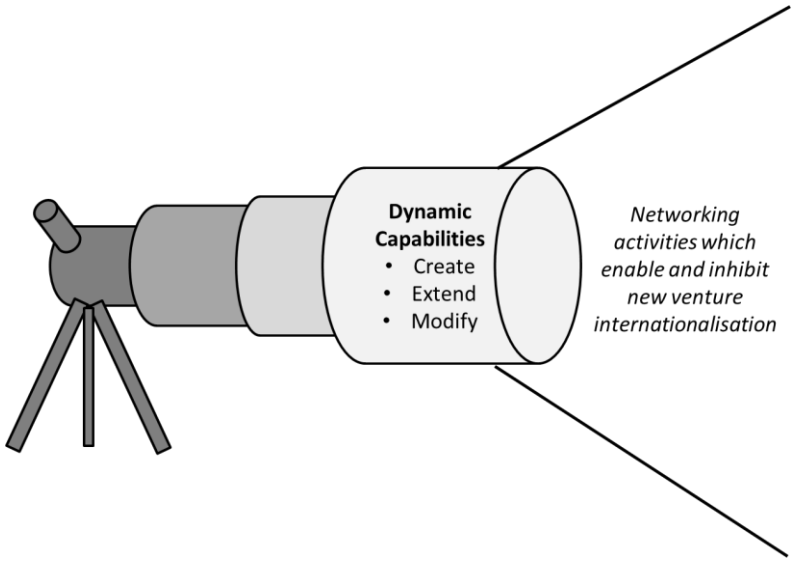
Research Problem Statement

Existing theories do not sufficiently explain *how* technology start-ups build dynamic capabilities in networking to enable their new venture internationalisation.

5.3 Conceptualisation and Theoretical Lens

Sapienza et al. propose that dynamic capability research that examines what INVs "do and the resources they control, including the social capital they and their managers have amassed" would be "enlightening" to advance future research (2006: 930). In Chapter 2, the author argues that Helfat et al. (2007) asset orchestration framework is a useful theoretical lens to examine the development and deployment of dynamic capabilities in technology new ventures. Moreover, section 3.4 demonstrates dynamic capabilities is a useful lens to examine NVI, while section 4.4 indicates the conceptual appeal of this lens to examine an INV's networking capabilities. This study therefore draws on Helfat et al. (2007: 4) definition that a "Dynamic capability is the capacity of an organisation to purposefully create, extend, or modify its resource base." Figure 5-2 thus illustrates that Helfat et al. (2007) is a useful lens to examine *how* INVs (1) create, (2) extend, and/or (3) modify their social capital and *why* certain networking activities enable or inhibit NVI.

Figure 5-2: Dynamic Capabilities as a Research Lens



Source: The Author

Andersen (1993: 220) emphasises in any conceptualisation, researchers must provide an "operational definition" of an emerging concept in order to outline its boundaries in preparation for forthcoming analysis. Nevertheless, Carlile and Christensen (2005: 23) argue: "well intentioned academics unwittingly contribute to the [original research] problem by articulating tight boundary conditions outside of which they claim nothing." Therefore, drawing on Helfat et al. (2007), the researcher adopts a general working definition of networking capability:

> A **networking capability** is the *capacity* of a *focal actor* to *purposefully create*, *extend*, or *modify* its *social capital*.

This general definition aims to integrate dynamic capability (Helfat et al. 2007) and social capital (Nahapiet and Ghoshal, 1998; Adler and Kwon, 2002) perspectives. Firstly, the researcher uses Helfat and Peteraf's (2003) notion of "capacity" to emphasise the focal actor's ability to use network relationships to perform a specific task in at least a minimally satisfactory manner. Secondly, in line with Lavie (2006) the researcher replaces the "organisation" with the "focal actor" to assume that networking capability is an egocentric rather than dyadic concept (e.g. Dyer and Kale, 2007). The term focal actor also assumes away the notion that dynamic capability is an organisational capability, and provides conceptual scope to consider whether this capability may emerge at individual or team levels

of analysis. Furthermore, given the general nature of this definition, researchers can use it to examine large and small firms, with the view of exploring contextually specific capabilities.

Thirdly, the term "purposefully" assumes that entrepreneurial actions reflect some degree of intent. Despite the emergence of effectuation logic (e.g. Sarasvathy, 2001), this study maintains that dynamic capability is a higher-order capability that is rooted in strategic and innovative acts of entrepreneurial behaviour (e.g. Teece, 2007). Therefore, in line with Lavie (2006: 162) this study assumes entrepreneurs and their new ventures that exhibit dynamic capabilities demonstrate "intended rationality" – that is actors *strive* to make rational decisions, despite the cognitive biases and information constraints that skew their choices (Simon, 1961; March, 1994). In other words, this study acknowledges human behaviour is irrational, but assumes that actors *aim* to behave rationally. Following Cui et al. (2011), this study will explore signals of strategic intent and determine whether networking behaviour is effective in the implementation of strategic change.

Fourthly, this study draws on section 4.2 discussion and distinguishes between networking (Dubini and Aldrich, 1991; Watson, 2007) and social capital (Nahapiet and Ghoshal, 1998; Adler and Kwon, 2002). Thus, based on Table 4-1 networking definitions and the discussion in section 4.5, the researcher defines "*networking as the process of forming and strengthening ties through the exchange of information and resources to advance each actor's long-term development.*" This definition encapsulates the major arguments that networking is an: (1) entrepreneurial behaviour (Zhao and Aram, 1995); (2) is an individual (Gilmore and Carson, 1999) and/or firm-level (Jarillo, 1989) process; (3) helps form new and strengthen existing ties; (3) functions through the exchange of information (Cromie and Birley, 1992) and (5) helps build long-term relationships (Miller et al. 2007).

Additionally, this study adopts Nahapiet and Ghoshal's (1998: 243) definition that social capital is "the sum of resources embedded within, available through, and derived from the network of relationships by an individual or social unit." In accordance with Maurer and Ebers (2006: 263), this study uses Nahapiet and Ghoshal's (1998) "organizing framework, as it offers a reasonably comprehensive conceptualization of social capital that accommodates the major concerns of the extant literature." More specifically, this study adopts Pennings et al. (1998) assumption that social capital is an intangible asset that organisations can use to achieve individual or company goals. Therefore, the researcher

emphasises Watson's (2007: 855) argument that the core purpose of networking is to enhance an entrepreneurial actor's social capital.

For analytical purposes, this study also draws on Adler and Kwon (2002) and distinguishes between the sources and effects of social capital. That is, the researcher assumes that the sources (i.e. the inputs) are identifiable through the structural, relational, and cognitive dimensions of social capital (Nahapiet and Ghoshal, 1998). Whereas, the researcher assumes the effects (i.e. the outputs) equate to the information and resources the focal actor can obtain from their involvement in a specific network of relationships (Adler and Kwon, 2002). Therefore, taking a task contingency view (Krackhardt and Hanson, 1993; Helfat and Peteraf, 2003), the focal actors capacity to create, extend (i.e. invest), or modify its social capital is then dependent on whether the actor can utilise this asset to effectively perform a specific "strategic task" in hand. Therefore, based on this capability perspective, the researcher proposes that:

Working Thesis Statement

Networking is a process of dynamic capability development that involves the creation, extension, and modification of social capital, which is likely to enable new venture internationalisation.

5.4 Aim, Objectives, and Conceptualisation

It is important to emphasise that the following aim and research objectives are the eventual outcome of several years of "abductive" research (Dubois and Gadde, 2002). Chapter 6 will therefore describe how the researcher retrospectively arrived at these eventual research objectives. Thus, based on this research problem, the overarching aim of this thesis is:

To *explore how technology start-ups build dynamic capabilities in networking to enable their new venture internationalisation.*

The researcher therefore intends to achieve three research objectives through an exploration of five research questions:

- ***Objective 1****: To explore* ***how*** *INVs create, extend, or modify their social capital in high-technology markets.*

  RQ1: How do INVs ***create*** social capital?

  RQ2: How do INVs ***extend*** their existing social capital?

  RQ3: How do INVs ***modify*** their social capital?

- ***Objective 2:*** *To examine* ***why*** *specific networking activities enable or inhibit new venture internationalisation in high-technology markets.*

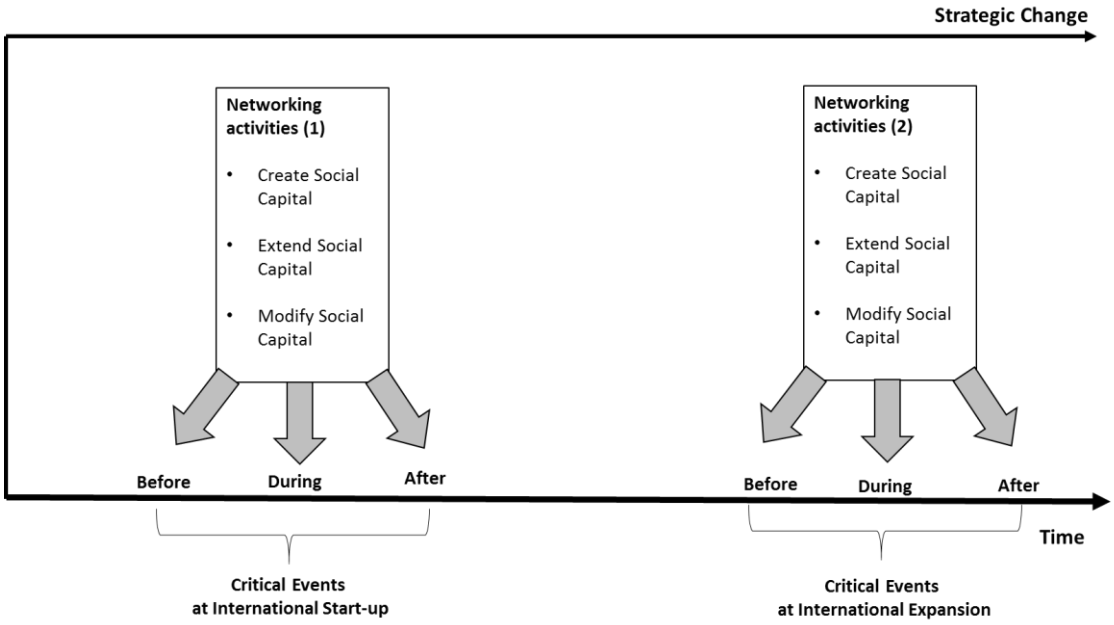
  RQ4: Why do certain networking activities ***enable*** *or* ***inhibit*** new venture internationalisation?

- ***Objective 3***: To determine ***which*** network processes underpin networking capability development in new venture internationalisation?

  RQ5: Which network processes underpin networking capability development in new venture internationalisation?

Figure 5-3 thus presents the theoretical framework that aims to support the researcher achieve these three research objectives.

Figure 5-3: Theoretical Framework



Source: The Author

Section 5.3 indicates that theoretical framework aims to integrate dynamic capability (Helfat et al. 2007) with social capital (Nahapiet and Ghoshal, 1998; Adler and Kwon, 2002) to examine the development and deployment of networking capabilities on NVI. Chapter 4 indicates that networking is a black box within both entrepreneurship and IE research, which means research objective one, aims to unlock the black box of networking. Given this thesis argues networking is a process of dynamic capability development, this study will use Nahapiet and Ghoshal's (1998) framework to examine the networking activities that involve creation, extension and modification of structural, relational, and cognitive social capital for to enable NVI.. In line with Autio et al. (2011), this study assumes in INV research, processes are a more appropriate unit of analysis than routines due to the *de novo* nature of some entrepreneurial practices. Therefore, research objective one will replace the traditional routine based definition with process (Autio et al. 2011) to investigate the various networking activities that help firms create, extend, and modify social capital (Nahapiet and Ghoshal, 1998; Alder and Kwon, 2002). Following section 4.4, this study takes a broader perspective and assumes INV social capital consists of both inter-personal (e.g. Ellis, 2011) and inter-firm ties (e.g. Coviello and Munro, 1997). Section 4.4.1 emphasises that most INVs will need to create new stocks of social capital to support early and rapid growth (e.g. Arenius, 2002; Prashantham and Dhanaraj, 2010). However, section 4.4.1 indicates there is scant research that specifically investigates the networking activities that underpin the

creation on INV social capital. In response to this gap, this study will seek to examine how INVs create social capital.

Following this, section 4.4.2 reports on how INVs "invest" (i.e. resource extension) in social capital. Jones and Coviello (2005) argue the development of specific cross-border relationships (e.g. co-R&D and distribution agreements) are "landmarks" in a new ventures chronology of internationalisation. Consequently, section 4.2.2 reports on the importance of building trust and commitment in relationships, which is a counterstone in the accumulation of relational social capital. Nevertheless, section 4.4.2 reports that various conceptual (e.g. Slotte-Kock and Coviello, 2010) and empirical (e.g. Ozcan and Eisenhardt, 2009) studies report existing literature on "network development" is overly deterministic and does not reflect how new ventures build a network of relationships. Therefore, to address this gap, this study seeks to explore how INVs extend their existing stocks of social capital.

Finally, this study seeks to examine how INVs modify their social capital. Section 2.4.3 indicates that asset orchestration involves several resource modification processes (i.e. retrenchment, retirement, renewal, replication, redeployment, and recombination). Consequently, the researcher uses these modification processes to examine how INVs adapt and transform their new and existing stocks of social capital for the purposes of NVI. Given that section 4.4.3 reports on the potential "dark-side" and deprecation of social capital, conceptually, it is evident that an INV's networking can support the realignment and transformation of its social capital.

Research objective two therefore aims to examine the networking activities that influence NVI. Ireland et al. (2002) note in strategy content research, *why* questions are useful in order to understand the actual context of phenomena. Research objective two will therefore aim to ask why certain networking activities enable and inhibit NVI. This study will therefore examine NVI as the major output of networking behaviour. Dutta et al. (2005: 277) [5] define a capability as "the efficiency with which a firm employs a given set of resources (inputs) [i.e. social capital] at its disposal to achieve certain objectives (outputs) [i.e. NVI]." Dutta et al. (2005: 278) notes this reasoning suggests capabilities are an "intermediate transformation ability" between resources (inputs) and objectives (outputs). Zahra (2005) notes INVs rarely operate with tangible and measurable objectives, and this model therefore assumes ventures work towards "outputs" that are congruent with NVI, rather than "objectives" to increase the potential scope of analysis.

Section 2.3 describes the dynamic capabilities debate, which indicates there is now recognition that the core purpose of dynamic capabilities are to implement strategic change (e.g. Zahra et al. 2006; Helfat et al. 2007). This study adopts Rajagopalan and Spreitzer (1997: 49) definition that strategic change is "a difference in the form, quality, or state over time (Van de Ven and Poole, 1995) in an organization's alignment with its external environment." In the context of INV research, McDougall and Oviatt (1996: 35) note that strategic change is relatively unexplored and concerns the changes in a new ventures internationalisation strategy (i.e. exporting, licensing, alliances, joint ventures, direct investment, etc.) which require unique bundles of competencies. Moreover, section 2.3.3 emphasises that strategic management research indicates that strategic change can result in the realignment (i.e. adaptation) and transformation (i.e. revolution) of organisations (Balogun and Hailey, 2008: 21). However, Zahra (2005: 23) argues: "we need to no more about the role of the top management team's experience, in terms of both maturity and of learning, and therefore may see opportunities to embark on strategic changes to better position their INVs." Zahra and George (2002) also report that IE research on strategic change is rare with the exception of McDougall and Oviatt's (1996) initial findings. Helfat et al. (2007) conceptualisation therefore provides a unique theoretical lens to examine strategic change in INVs.

Finally, objective three will theorise on which network processes underpin networking capability development in NVI. Research question will therefore aim to achieve this third objective. Through the theoretical framework, the aspiration is to build theory that helps explain networking capability development. This abductive research will therefore iterate between theory and data, with the expectation of building a conceptual model that has potential for future empirical testing.

5.5 Conclusion

In conclusion, this chapter presents the aim, objectives, and research question of this thesis. Firstly, this chapter presents the problem that most technology start-ups are resource constrained, and do not have the sufficient managerial, technological and financial capabilities to compete in international markets. Consequently, networking and social capital is widely reported as a means to overcome these resource constraints, but this chapter indicates that most INVs in technology industries do not have the skills or capabilities to originate a high-performing network of relationships. This chapter therefore identifies the

research problem that existing theories do not sufficiently explain how technology start-ups build dynamic capabilities in networking to enable NVI. Secondly, this chapter argues that networking capability is a useful lens to examine this problem, but highlights that existing interpretations are less clear on *how* networking capabilities emerge, and *why* certain networking activities enable or inhibit NVI. As a result, this chapter presents the working thesis that networking is a process of dynamic capability development that involves the creation, extension, and modification of social capital, which is likely to enable NVI. Finally, this chapter presents the overall aim, objectives, and theoretical framework, which now drives this subsequent abductive research.

6 – Research Methodology

Chapter Aim

To describe the research methodology of this study.

Chapter Objectives

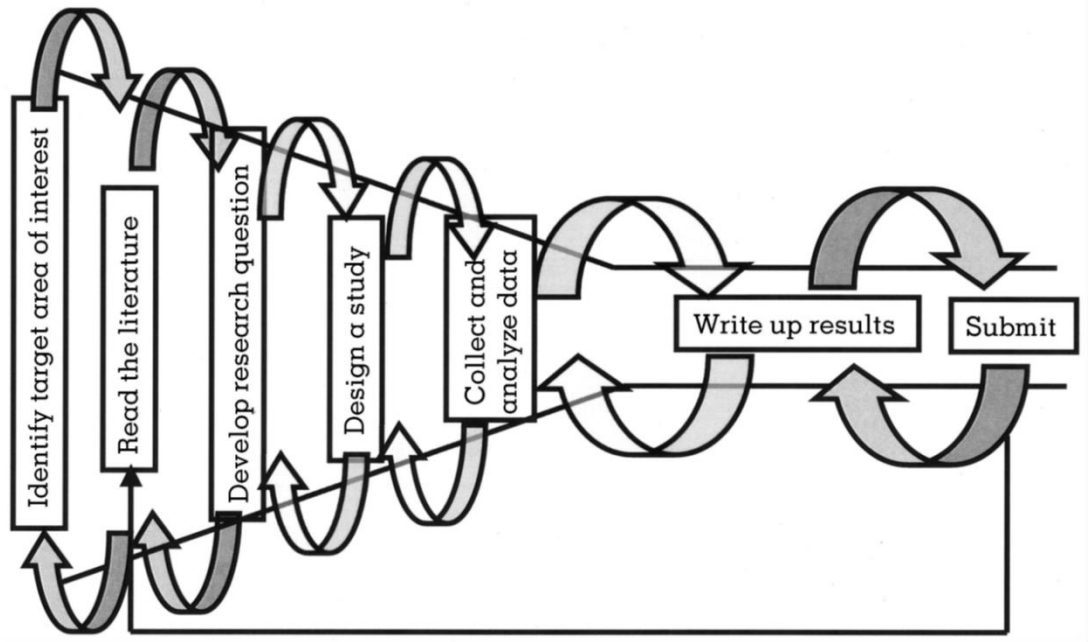
- **To underscore the philosophical assumptions of this study.**
- **To identify a suitable research strategy for this study.**
- **To justify the choice of research design.**
- **To discuss the phases of data collection and analysis.**

6.1 Introduction

This chapter aims to describe the research methodology of this study by providing a comprehensive understanding of this research process. Edmondson and McManus (2007: 1173) note "the process of field research as a journey [that] may involve almost as many steps backward as forward." The authors note this issue conflicts with the traditional implicit view that the research process is linear and occurs over a number of sequential steps or stages which "starts with a literature review, moves onto research questions, data collection, and analysis and ends seamlessly in publication" (Edmondson and McManus, 2007: 1173). Instead, Van Maanen et al. (2007: 1150) argue this traditional view is "now an old complaint and now something of an institutionalised one, but we seem not to have moved toward much of a resolution, beyond that of an infrequently published confession as to how one's research 'actually' unfolded." Edmondson and McManus (2007) thus argue researchers' are more likely to achieve "methodological fit'" through an iterative and cyclical learning journey.

Figure 6-1 therefore illustrates this iterative and cyclical research process. This chapter therefore intends to achieve three objectives. Firstly, this chapter will introduce readers to the researcher's doctoral research journey. This is in accordance with Turner (1981) who argues to understand a researcher's philosophical stance; the reader is entitled to know something of the aims, expectations, hopes, and attitudes that the writer brought to the field with him. Secondly, the researcher will therefore describe the development of his philosophical stance. Thirdly, the researcher will discuss his research strategy in response to the emergence of his research design. Fourthly, the researcher will discuss the emergent phases of data collection and analysis. Finally, this chapter will conclude with an overview of the researcher's methodological approach.

Figure 6-1: Field Research as an Iterative, Cyclic Learning Journey

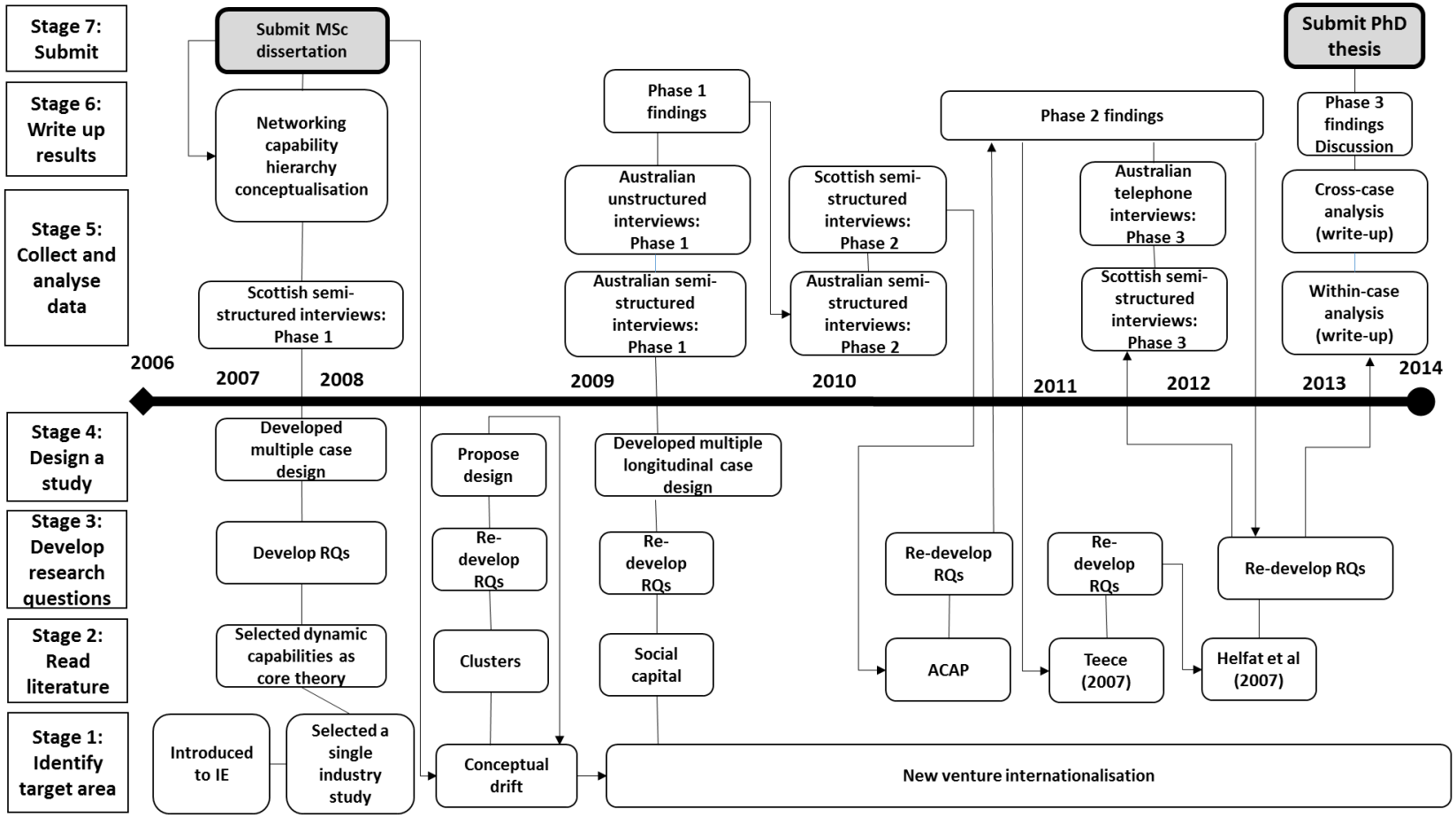


Source: Edmondson and McManus (2007: 1173)

6.2 Research Journey

Figure 6-2 depicts the researcher's doctoral research journey. In accordance with Edmondson and McManus (2007), the researcher chronologically maps his research journey through cycles of a seven-stage process. Indeed, the researcher would argue his research journey has been everything but linear as it has occurred over a series of cyclical stages and learning loops. Indeed, to use Mintzberg's (1979) nomenclature, the researcher's strategy has been emergent in response to challenges, discoveries, conceptual drifts, and epistemological shifts that occurred over this research journey. Nevertheless, in line with Mintzberg's (1979) logic on emergent strategy, the researcher has always maintained the vision to deliver a theory building PhD thesis. Echoing Alvesson and Sandberg (2011), this vision emerged from the desire to address a research problem, which in this case, are the challenges of *networking capability development* in theoretical context of NVI. Moreover, Figure 6-2 illustrates this journey unfolded within the global medical technology sector, as the researcher wanted to *learn* about a single industry empirical context that he initially knew nothing about (Pettigrew, 1990).

Figure 6-2: Research Journey



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6.3 Research Philosophy and Approach

The word ontology derives from the Greek words "ontos" (being) and "logos" (theory or knowledge) (Johnson and Duberley, 2000: 67). Eriksson and Kovalainen (2008) summarise that ontology is about ideas of existence and the relationship between people, society, and the world at the most general. The central tenant of research philosophy is a question of whether social entities (people, organisations, industries or societies) should be "considered *objective* entities that have a reality external to social actors, or whether they can and should be considered *social constructions* built up from the [*subjective*] perceptions and actions of social actors" (Bryman, 2008: 18). Thus, Easterby-Smith et al. (2002) argues the philosophical debate between *objectivism* and *subjectivism*, then offer contrasting views on how scholars should conduct social science research.

Eriksson and Kovalainen (2008) argue *objectivism* is based on the assumption that social reality has an independent existence, which is out with the control of knower (i.e. the researcher), while *subjectivism* lends itself to the view that social actors are the producers of social reality through their involvement in social interaction. Therefore, the assumptions we make about the nature of reality (*objectivism* versus *subjectivism*) allows researchers to base our assumptions about the best and most efficient ways of inquiring (epistemology) into the nature of the world. Johnson and Dunerley (2000: 2) explain researchers derive the term "epistemology" from two Greek words: "episteme" which means "knowledge" or "science" and "logos" which means "knowledge" "theory" or "account." In other words, Johnson and Duberley (2000: 2) argue epistemology is concerned "with knowledge about knowledge." Bryman (2008) explains an epistemological issue concerns the question of what is (or should be) regarded as acceptable knowledge in a discipline. Thus, Easterby-Smith et al. (2002) argue in management research *positivism* (objectivism) and *interpretivism* (subjectivism) are the epistemological traditions that dominate this philosophical debate.

Bryman (2008: 13 defines "positivism is an epistemological position that advocates the application of the methods of the natural sciences to the study of social reality and beyond." Eriksson and Kovalainen (2008) notes positivists are *empiricists* as they construe reality through observation and measurement. Saunders et al. (2003) note positivists most commonly use quantitative methods to conduct deductive research to *explain* casual relationships between variables. Easterby-Smith et al. (2002: 42) also emphasise that the main strengths of quantitative methods is they can "provide a wide range of situations, they

can be fast and economical, and particularly when statistics are aggregated from large samples, they may be of considerable relevance to policy decisions." Indeed, Ghauri and Grønhaug (2005) explain positivistic research is particularly useful when there is a need to confirm the validity, reliability, and most crucially, the generalizability of research findings.

However, since the researcher aims to build theory, it seems this study fits more within an interpretivist paradigm (Saunders et al. 2003). Bryman (2008: 694) explains: "interpretivism is an epistemological position that requires the social scientists to grasp the subjective meaning of social action." Since the researcher seeks to gain a deeper understanding of the research context (i.e. the global medical technology sector) in turn with the *meanings* and *mechanisms* that entrepreneurs attach to certain events, it seems interpretivism is a more appropriate research approach. Consequently, Denzin and Lincoln (1998) note there are many forms of interpretivism, but all share the philosophical view that reality is socially constructed and *understanding* (e.g. making sense of the world) can only be achieved through the researchers' subjective interpretations. Van Mannen (1983: 9) notes that interpretivists commonly use qualitative methods to conduct inductive research that involves "interpretative techniques which seek to describe, decode, translate, and otherwise come to terms with the meaning, not frequency of certain more or less naturally occurring phenomena in the social world."

Denzin and Lincoln (1998) argue *phenomenology*, *hermeneutics*, *postmodernism* and *poststructuralism* are four "philosophical bases" that inform interpretivism. Bryman (2008) explains that although these philosophical perspectives largely overlap, they recommend researchers should be explicit in the interpretive view they adopt. Briefly, Alvesson and Willmott (1996) notes hermeneutics aims to *understand* a social actor's unique perspective but is insufficient for the study of process. Johnson and Duberley (2000: 91) also argue that postmodernism and poststructuralism are "extreme" interpretive approaches that out rightly reject positivistic epistemology and support the ontology that reality is a *socially deconstructive* process.

However, Patton (1990) argues phenomenology aims to gain a deeper understanding of a particular phenomenon through the participant's *experiences*. Consequently, Cope (2005) argues phenomenology empowers the researcher to work within the "context of discovery" to interpret the participant's "world" by exploring the experience and consciousness of a phenomenon (i.e. the entrepreneurial firm). Furthermore, Pettigrew (1990) argues that

phenomenology enables researchers to build process theories by making comparisons based on observed subjective experience. Thus, the researcher would argue that phenomenology is the most appropriate form of interpretivism to conduct this exploratory research. The following section will now discuss choice of research strategy given the researcher's ontological and epistemological stance.

6.4 Research Design

This section outlines the research design of this study. Saunders et al. (2003) argue there is a need for a clear research strategy to ensure the researcher creates a suitable research design. Consequently, Easterby-Smith et al. (2006) argue the choice of a suitable research strategy is primarily dependent on the researcher's aim and objectives. Figure 6-2 depicts that despite various iterative steps the researcher's overall aim has not dramatically changed throughout this process. That is, the researcher has always intended to *explore how technology start-ups build dynamic capabilities in networking to enable NVI*. However, this refined aim is the outcome of multiple iterations as the researcher sifted between theory and data. Nevertheless, as mentioned in section 6.2, the researcher has always maintained the vision to build theory through qualitative research. Therefore, due to this constant iteration between theory and data, the researcher followed an "abductive" approach to case study research (Dubois and Gadde, 2002).

Suddaby (2006: 639) refers to the original work of Pierce (1903) who recognise that pure induction or pure deduction are "necessarily sterile" and that new ideas result from the interplay between induction and deduction, which he termed "abduction." That is, Suddaby (2006: 639) paraphrases Pierce (1903) and describes abduction as the "fallible flash of insight that generates new conceptual views of the empirical world." According to Dubois and Gadde (2002: 559) an "abductive approach is fruitful if the researcher's objective is to discover new things – other variables and other relationships." These authors then propose an analytical process of "systematic combining where the researcher's theoretical framework, empirical fieldwork, and case analysis evolve simultaneously, and is particularly useful for the development of new theories" (2002: 554).

Recent IB (Piekkari et al. 2008; Welch et al. 2011) and IE (Nummela and Welch, 2006) research has emphasised the growing importance of theorising from case study research. Indeed, Langley (1999) argues that case study research is particularly useful for asking *how* and *why* contemporary events and activities unfold over time. Figure 6-2 therefore illustrates

since the researcher initially aimed to *explore* IE within the global medical technology sector, it is apparent case study research would help understand these contemporary issues.

6.4.1 Case Study Research Strategy

This study draws on both the "Eisenhardt Methodology" (e.g. Eisenhardt, 1989) and "Gioia Methodology" (Gioia et al. 2013) as an integrative approach to building theory from case study research. Langley and Abdallah (2011: 203) emphasise that unlike quantitative research, "the rules, formats, and norms for doing, writing, and publishing [qualitative research] are not uniform or well-established." Consequently, on this research journey, the researcher began by using Eisenhardt's (1989) approach to theory building from case study research. However, as data collection and analysis emerged, the researcher became more acquainted with Gioia et al. (2013) approach to theorising from case study research. Interestingly, Langley and Abdallah (2011) argue that the "Eisenhardt Template" and "Gioia Template" have both given rise to some highly influential contributions in strategy process research (e.g. Eisenhardt and Bourgeois, 1988; Corley and Gioia, 2004; Nag et al. 2007; Ozcan and Eisenhardt, 2009). However, Welch and colleagues (e.g. Marschan-Piekkari and Welch, 2004; Welch et al. 2011; Welch et al. 2013) emphasise that there has been a tradition in management research that assumes interpretivism underpins all of qualitative research.

Indeed, recent management research has begun to deconstruct the philosophical and methodological foundations that underpin theorising from case study research. For example, Welch et al. (2011) emphasises that Eisenhardt (1989) and Yin (2004) actually adopt a positivist tradition, whereas case study researchers such as Stake (1995) follow a more interpretivist tradition. Interestingly, Langley and Abdallah (2011: 205) emphasise that Gioia and his colleagues (e.g. Corley and Gioia, 2004; Nag et al. 2007) similarly adopt an interpretivist approach to case study research. Consequently, Langley and Abdallah (2011) argue that the Eisenhardt Method strives to develop theory in the form of testable propositions, whereas the Gioia Method aims to capture participant meaning through the emergence of process models and novel concepts. Section 6.4.3 and 6.4.4 thus describes how data collection and analysis emerged, as the researcher was abductive in his approach, as his case study research strategy contained both deductive (theory inspired) and inductive (data inspired) elements. Therefore, as the researcher's case study strategy emerged, he took inspiration by combining the Eisenhardt Method (e.g. Ozcan and Eisenhardt, 2009; Hallen

and Eisenhardt, 2012) and Gioia Method (e.g. Corley and Gioia, 2004; Maitlis and Lawrence, 2007; Tippmann et al. 2012) to design this case study research.

Indeed, Yin (2003: 39-40) suggests that there are four broad types of case study design. These case study designs consist of a (1) holistic single case design, an (2) embedded single case design with multiple levels of analysis, a (3) multiple-case design, and an (4) embedded multiple-case design with multiple levels of analysis. Relatedly, Patton (2002) notes that making a decision about the unit of analysis is a critical step in the research process. Yin (2003: 23) suggests a general guide to determine the unit of analysis is to consider the initial research questions. Nevertheless, Davidsson (2006) argues in entrepreneurship research the identification of the unit of analysis can be challenging due to conflicting *levels* of analysis. That is, Davidsson (2006) argues since the individual entrepreneur forms a central part of the new venture resource base, their orientation seems to merge with the firm itself. To resolve this challenge, Davidsson (2006) argues entrepreneurship researchers can examine any (or multiple) levels of analysis – i.e. the individual, firm, or region – but researchers must ensure their research design is sufficient to explore the *behaviours* of these entities, whether it be an individual, firm or region.

Davidsson and Wiklund (2001) thus argues that longitudinal case studies are particularly useful for researching the *behaviour* of such entities. However, Leonard-Barton (1990) argues in longitudinal research the unit of analysis is difficult to pinpoint, as this is likely to change as the research design emerges over time. For example, Langley (1999: 692) argues that process data therefore "consist largely of stories about what happened and who did what when – that is, events, activities, and choices ordered over time." Therefore, in accordance with Van de Ven and Huber (1990) the unit of analysis in processual studies are typically associated with "how" and "why" questions. Interestingly, Cope and Watts (2000) argue that entrepreneurial behaviours are likely to unfold through an array of *critical events*, which provide an exploration of the entrepreneurial actor's experience and learning. Miles and Huberman (1994: 111) define an event as "as a specific action or occurrence mentioned by any respondent and not denied or disconfirmed by anyone else." Moreover, the authors define "critical incidents" as those as "important or crucial, and/or limited to an immediate setting" (1994: 113). Based on Yin's (2004) rationale, the researcher made the decision in the first phase of this research, to use *critical events* as a single unit of analysis to create a *holistic* multiple-case study design.

Nevertheless, as section 6.4.3 explains, in phase two and three of this research, the researcher's views on the unit of analysis began to change. That is, Figure 6-2 depicts *after* the researcher's preliminary findings on the importance of networks and social capital his attention shifted towards the importance of specific *network relationships*. Coviello and Munro (1997: 365) define network relationships as "social and industrial relationships among for example, customers, suppliers, competitors, family, and friends." Therefore, by phase three, this longitudinal research meant the unit of analysis had changed as the researcher began to use the *critical event* as a unit of observation (Ployhart and Vandenberg, 2010). This change in research focus meant the researcher made the *subsequent* decision to use *network relationships* as the unit of analysis within this ***holistic longitudinal multiple-case study design***. Therefore, given dynamic capability research is still at an exploratory phase (e.g. Vogel and Güttel, 2013) the researcher argues building theory from case study research is the most appropriate research strategy to *explore how technology start-ups build dynamic capabilities in networking to enable NVI*.

6.4.2 Sampling

Miles and Huberman (1994: 30) argue sampling not only involves decisions about which participants to observe at interview, but also about the settings, events, and social processes. This section therefore describes and justifies the researcher's sampling choices. To being with, Table 6-1 summarises researcher's choices in terms of these sampling parameters:

Table 6-1: Sampling Parameters

Sampling Parameters	**Choices**
Settings:	Global medical technology sector
Focal actor	International new venture
Actors:	Founders, top-management team, network members
Events:	Start-up events, commercialisation events, international events
Processes:	Firm founding, internationalisation, bridging social capital, bonding social capital

Source: Adapted from Miles and Huberman (1994: 30)

The *empirical setting* of this study is the global medical technology sector. Section 1.2 describes the characteristics of this industry sector. The choice of the global medical technology sector was important for several reasons. Firstly, this industry sector is what Crick and Jones (2000) would describe as an "international high-technology market." That is, the authors argue for high-technology firms that face challenges of new and emerging markets that are frequently international and are likely to be involved in a specialised niche market that spreads thinly across the world. Secondly, this industry sector is useful to

conduct IE research since research has found that for non-US based medical device firms internationalisation is a prerequisite for survival and growth (Chatterji, 2009). That is, the US medical technology sector is the single largest and most open medical device market in the world (Ernst and Young, 2010).

However, Frost and Sullivan (2008) report for non-US based medical technology firms, such as UK and Australian start-ups, their national and local governments strictly govern healthcare, which has created an almost impenetrable local barrier to entry. In this empirical setting, this means such firms have no choice but to internationalise (Brännback et al. 2007). Thirdly, start-ups that operate in the global medical technology sector are what Bell et al. (2004) would describe as "knowledge-intensive" firms. The authors define knowledge intensive firms as those "having a high added value of scientific knowledge embedded in both product and process" (2004: 24). Therefore, this reasoning facilitated the researcher's sampling choice to explore the global medical technology sector as a sufficient empirical setting.

Additionally, given the global nature of the medical technology sector, the researcher capitalised on the opportunity to conduct cross-national research in the UK and Australia. Therefore, the *focal actor* of this study is the INV (Oviatt and McDougall, 1994). Ghauri (2004) argues multiple case study research is particularly powerful for IB research that aims to collect data in cross-national settings. Figure 6-2 thus illustrates in phase two of this journey, the researcher secured a visiting scholarship with the *University of Queensland* in Brisbane, Australia. In accordance with the cross-national case study protocols put forth by Loane and Bell (2006) and Loane et al. (2007), the researcher used a multi-method approach to sampling. Firstly, the researcher used purposeful sampling (Patton, 1987) to create a "non-representative" sample of Scottish and Queensland located medical technology firms. Unlike quantitative research, representativeness is not the criteria for case selection (Stake, 1995). Instead, Paton (1987) argues qualitative researchers are more likely to use (1) *quota*; (2) *purposeful*; (3) *snowball*; (4) *self-selection*; and/or (5) *convenience* as non-probability sampling techniques. Following Ghauri and Grønhaug's (2005) guidance on the design of cross-national research, the researcher decided to use purposeful sampling to create this multiple-case design.

Patton (1987) describes there are a variety of purposeful sampling techniques which include (1) *extreme* or deviant case; (2) *maximum variation* (heterogeneous sampling); (3)

homogeneous; (4) *typical case*; and (5) *critical case* sampling. On the review of these techniques, the researcher decided to source a *heterogeneous* purposeful sample of medical technology firms to capture "central themes or principal outcomes that cut across a great deal of participant or program variation" (Patton, 1987: 53). However, in line with Coviello and Jones (2004) the researcher followed a number of "sampling equivalence" protocols to ensure the validity and reliability of this cross-national research. Firstly, the researcher felt the UK (i.e. Scotland) and Australia (i.e. Queensland) would be an interesting comparison due to shared history, language, and institutions that characterise the cultures of these nations. Moreover, another reason why the researcher felt Queensland would be an interesting comparison to Scotland is due to their similar population size and knowledge base. For example, both regions have a similar population of five million inhabitants, and a similar amount of universities with a comparable academic standard. More specifically, both regions are similar in that they are not located in central commerce hub (i.e. London/Sydney), while the majority of life science activity takes place in the Central Belt of Scotland or in South East Queensland[6].

Secondly, the researcher's choice of a single industry study helped control the equivalence of this cross-national sample. Consistent with other IE research (e.g. Autio et al. 2000; Zahra et al. 2000; Jones et al. 2011) the researcher followed a strict protocol that consisted of five criteria to build a purposeful sample of medical technology start-ups. Table 6-2 presents these sampling criteria. In line with Figure 6-2, it is important to emphasise that the researcher sourced a Scottish sample of medical technology firms in the first research phase, and then replicated this sampling technique to source a Queensland sample of firms in the second research phase. In both phases, the researcher used Table 6-2 criteria to source an appropriate sample.

[6] For more details on these regions see:
Life Sciences Scotland (http://www.lifesciencesscotland.com/) and
Life Sciences Queensland (http://www.lsq.com.au/).

Table 6-2: Purposeful Sampling Protocol

	Purposeful Sampling Protocol
1.	• Are independently owned and not a subsidiary (Prashantham and Young, 2011: 277).
2.	• Employ less than fifty full time employees (FTEs) and were less than seven years in age at first foreign market entry (Autio et al. 2000).
3.	• Were independently established to exploit a medical technology in the marketplace (Jones et al. 2011b).
4.	• Have an involvement in inward or outward cross border activities (e.g. R&D, production, or sales and marketing) within five years of inception (Jones, 1999; Zahra et al. 2000).
5.	• Could fit within one of Kazanjian's (1988) "stages of growth" model that examines the growth patterns of technology based new ventures. • These four stages include (1) conception and development; (2) commercialisation; (3) growth; (4) stability

Source: The Author

Firstly, the researcher trailed various online government databases such as *Scottish Enterprise - Life Sciences Scotland, Department of Trade & Industry* (DTI), *Nexxus Scotland,* and the Australian Federal Government sponsored site *AusBiotech.* In line with Mudambi and Zahra (2007), the researcher then developed a database of potential firms, which included key information such as (1) employee count; (2) firm age; (3) international activity; (4) description of technology/company; and (5) contact details including the CEO's name, address, telephone number, website, and email correspondence. Following this search, the researcher identified thirty-one potential companies in Scotland and ten potential companies in Queensland. Moreover, the researcher identified an additional twenty-three Australian companies in the event his local search was unfruitful. In total, researcher identified a potential sample of sixty-four medical technology firms.

The researcher then used Table 6-2 criteria to order and prioritise this sample into groups that most closely fitted his selection criteria. Consequently, the researcher then familiarised himself with the company by learning about the founder, its products and technologies *before* he made contact with the firm. Once the researcher felt confident about his initial knowledge of the company, he then telephoned each firm asking to speak with the CEO explaining he was a doctoral student who was conducting exploratory research on small medical device firms in both Scotland and Australia. This process was highly effective as the researcher secured four Scottish case firms from directly contacting eight firms and secured four Queensland firms within one hour as each firm were willing and enthusiastic to participate in the research. Table 6-3 lists this purposeful sample of medical technology firms. To maintain confidentiality the researcher follows protocols as seen in other case study research (e.g. Brown and Eisenhardt, 1997; Ozcan and Eisenhardt, 2009) and used

pseudonyms to maintain the anonymity of each participant. Table 6-3 thus presents the initial purposeful sample of firms that formed the first and second research phase.

Table 6-3: Purposeful Sample

Firm	Firm Age^	Location	No of found-ers	Firm size˘	Medical device classification†	Major value chain activity□	Cross border activities◊		Speed*
							Inward	Outwd	
Fertility	1	Edinburgh	2	<10	Fertility device – Class II	Production	R&D VC	S&M	< 1 year
FemMed	5	Glasgow	1	12	Fertility device – Class III	Production	VC	Prod S&M	3 years
StentGraft	7	Dundee	4	<10	Cardiology device – Class III	Production	VC	S&M	6 years
BioDevice	25	West of Scotland	2	12	Licensor and Co-R&D partner	R&D	VC	R&D S&M	3-5 years
PaceMaker	1	Brisbane	1	<10	Cardiology device – Class III	R&D	R&D	R&D	< 1 year
HeartBeat	4	Gold Coast	1	<10	Cardiology device – Class I	Production	R&D	R&D Prod S&M	< 1 year
SafeMed	7	Gold Coast	1	<10	Safety syringes – Class II	Production	R&D	R&D Prod S&M	<1 year
BloodTrack	25	Brisbane	2	25	Diagnostic device – Class I	Production	R&D	R&D S&M	< 1 year

^ Firm age is at the time of the first semi-structured interview.

˘ Firm size is based on full-time equivalent employees.

† There is no global standard of medical device classification (MHRA, 2014). However, the MHRA – the UK regulator of medical devices argue most regulatory frameworks encapsulate three classifications of medical device. These are "Class I" which is generally regarded as low risk; "Class II" which is generally regarded as medium risk; "Class III" which is generally regarded as high-risk (MHRA, 2014).

□ This indicates the firm's major value chain activity. "R&D" refers to research and development; in the case of production, this is where the firm is the "legal" manufacturer of a medical device even if they subcontract production.

◊ In accordance with Jones (1999) this refers to the firm's inward or outward cross-border activities. "R&D" refers to research and development, "Prod" refers to production, "S&M" refers to sales and marketing, and "VC" refers to venture capital.

* "Speed" refers speed to the length of time between foundation and the first cross-border activity.

Source: The Author

Figure 6-2 illustrates when the researcher progressed to phase three, he then used theoretical sampling (e.g. Eisenhardt, 1989) to choose cases that are likely to replicate or extend emergent theory. Consequently, section 6.4.4 describes that after the second phase of data analysis, in line with Pettigrew's (1990) recommendations the researcher selected four heterogeneous cases to examine various degrees of *networking capability development*. Since networking capability development is an emergent area of inquiry, the researcher selected (1) Fertility, (2) HeartBeat, (3) FemMed, and (4) SafeMed as these four cases were theoretically interesting and would support theory development.

Primarily, this theoretical sample provided the opportunity to replicate the protocols of existing longitudinal research that examines new venture performance at various stage of

growth (e.g. Kazanjian, 1988; Maurer and Ebers, 2006). Moreover, since initial findings show clear evidence that each participant had different perspectives and approaches towards networking, the researcher felt these case firms were most relevant to support theory development. Finally, the researcher felt this theoretical sample would best facilitate the "constant comparison" method, which Eisenhardt (1989) and Gioia et al. (2013) both argue is an important process in theory development.

6.4.3 Data Collection

Figure 6-2 depicts that data collection took place over a three-year period and unfolded over three phases. This involved a series of semi-structured interviews with entrepreneurs, unstructured interviews with industry experts and policy makers, observation at industry events, and extensive secondary data collection. In total, the researcher used these data collection techniques to examine 101 events that the participant firms identified as being important and in some cases critical to their overall growth and international development. As data collection and analysis emerged into the second and third phase, the researcher collected new data on 51 network relationships that the participant firms identified as having an influence on their growth and international development.

Thus, over this three-year period, the researcher conducted 17 semi-structured interviews with entrepreneurs, which amassed to 30 hours of transcribed data. During this period, the researcher also collected extensive secondary data on each case firm. These secondary data mainly consisted of written material such internal and external press reports, memos, along with text downloads of each case firm's company website over time. Moreover, in some cases the researcher was also able to collect company documents such as marketing material, annual reports, some strategic planning documents, along with email correspondence. In addition to this, the researcher collected 5 hours of unstructured interviews with industry experts and policy makers in combination with 5 days of observation at UK and Australian local industry events, which together helped triangulate this study's findings. Table 6-4 summarises these three phases of data collection:

Table 6-4: Phases of Data Collection

Firm	Phase 1	Phase 2	Phase 3	Totals
Fertility	• Semi-structured interview (1.5hrs) • External documents	• Semi-structured interview (2.5hrs) • Internal documents • External documents	• Semi-structured interview (3hrs) • External documents	• 3 semi-structured interviews • 7hrs
FemMed	• Semi-structured interview (1hr) • External documents	• Semi-structured interview (1hr) • Internal documents • External documents	• Semi-structured interview (1hr) • External documents	• 3 semi-structured interviews • 3hrs
StentGraft	• Semi-structured interview (1.5hr) • External documents	• Omitted from sample	• Omitted from sample	• 1 semi-structured interview • 1.5hrs
BioDevice	• Semi-structured interview (2.5hrs) • Internal documents • External documents	• Semi-structured interview (2.5hrs) • Internal documents • External documents	• Omitted from sample	• 2 semi-structured interviews • 5hrs
PaceMaker	• Semi-structured interviews (1.5hrs) • External documents	• Omitted from sample	• Omitted from sample	• 1 semi-structured interviews • 1.5hrs
HeartBeat	• Semi-structured interviews (2.5hrs) • Internal documents • External documents	• Semi-structured interview (2.5hrs) • Internal documents • External documents	• Telephone interview (1hr) • External documents	• 3 semi-structured interviews • 6hrs
SafeMed	• Semi-structured interviews (1.5hrs) • Internal documents • External documents	• Semi-structured interviews (2hrs) • Internal documents • External documents	• Unavailable for interview • External documents	• 2 semi-structured interviews • 3.5hrs
BloodTrack	• Semi-structured interviews (1hr) • External documents	• Semi-structured interview (1.5hrs) • External documents	• Omitted from sample	• 2 semi-structured interviews • 2.5hrs
Network members	• 1 day of UK observation • 1 day of Australian observation	• Two unstructured Australian interviews (3hrs) • 1 day of UK observation • 1 day of Australian observation	• Two unstructured UK interviews (2hrs) • 1 day of UK observation	• 4 unstructured interviews • 5hrs • 5 days of observation
Total	• 8 semi-structured interviews • 13 hours of interview data • 2 days of observation	• 6 semi-structured interviews • 2 unstructured interviews • 15 hours of interview data • 2 days of observation	• 3 semi-structured interviews • 2 unstructured interviews • 7 hours of interview data • 1 day of observation	• 17 semi-structured interviews • 30hrs of semi-structured interviews • 4 unstructured interviews • 5hrs of unstructured interviews • 5 days of observation
TOTAL AMOUNT OF DATA COLLECTION				• **21 interviews** • **35 hours of interview data** • **5 days of observation**

Source: The Author

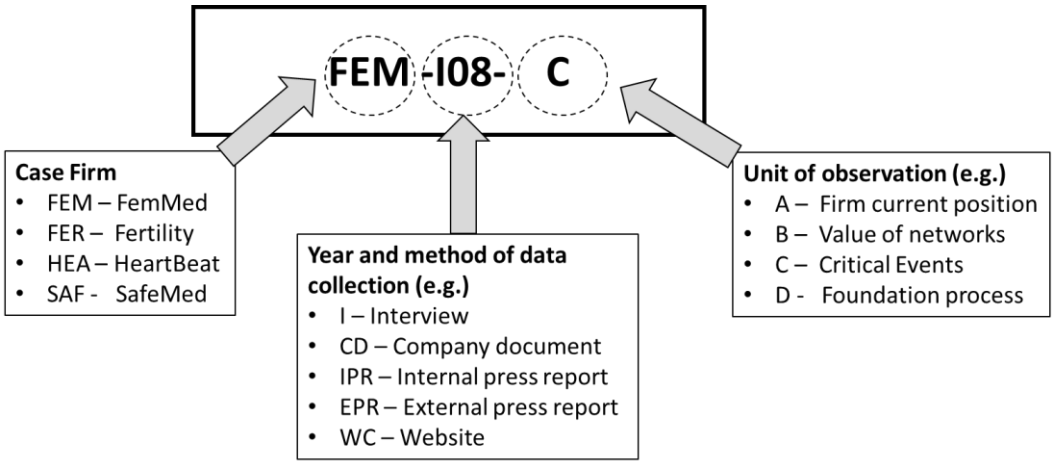
Data Collection Preparation

In accordance with Yin (2003), the researcher took several steps *prior* to data collection, to ensure the reliability of the emergent findings. Initially, the researcher developed a case study protocol, which includes an overview of the project, the goals, objectives, and issues surrounding relevant topics. This protocol was particularly useful in the early stages of data collection as the researcher could show this protocol to participants who wanted to learn

more about this research. This was primarily the case with the Australian case firms who shown a genuine interest in this research process.

Secondly, to improve the reliability of the results the researcher maintained what Yin (2003) describes as a case study database, which is included within Appendix 3. Gibbert et al. (2008) recommends in the event of longitudinal data collection, the researcher should follow Yin's (2003) protocols and maintain a case study database in order to ensure the reliability of these data. Therefore, from the researcher's experience the construction of this case study database was instrumental in helping organise the collection of these longitudinal data. Figure 6-3 illustrates the logical structure of how the researcher designed, listed, categorised, updated, retrieved, and administered this case study database:

Figure 6-3: Illustration of Database Model



Source: The Author

Thirdly, *prior* to data collection, the researcher designed a semi-structured interview guide. Saunders et al. (2000) notes semi-structured interviews are useful for conducting exploratory research and especially for understanding "what" "how" and "why" questions. Bryman (2008) also suggests semi-structured interviews are useful in situations where the researcher has developed a list of pre-defined questions derived from theory that researcher needs to initially address. Collis and Hussey (2003) also argue that semi-structured guides provide the researcher with the ability to ask certain questions, but in an order and sequence that is best suited to ensuring all necessary topics are covered. Cope (2005) argues semi-structured interview guides are particularly useful for entrepreneurship research in order to ensure a

research focus while maintaining a degree of flexibility when new and interesting themes emerge.

Therefore, in accordance with Yin (2003) the researcher used Appendix 2, as a preliminary semi-structured interview guide. As this was a preliminary research guide, the researcher's academic supervisor provided him with a template based on her previous research that was informed by resource-based (e.g. Barney, 1991; Peteraf, 1993) and IE based (e.g. Oviatt and McDougall, 1994; Jones and Coviello, 2005) theories. The researcher then adapted this interview guide for the purpose of his initial research questions with a list of open and closed questions to conduct *Preliminary Research on Resources, Dynamic Capabilities, and Path Dependence in Life Science Firms*. Consequently, following Patton's (1987) recommendations that researcher used a number of questioning techniques to ensure rich and in some focused participant responses.

These included the use of "rapport building" questions (i.e. Coffey and Atkinson, 1996), which are less intrusive questions at the beginning of the interview (e.g. Appendix 2: Section A) to enable the researcher to ask more personal and complex questions as the interview progresses. Following that, the researcher then used "experience/behaviour" questions (i.e. Appendix 2: Section B) which allow the participant to tell a "chronological story" of events, happenings, influences and decisions that the firm took over time (Coffey and Atkinson, 1996). The researcher then used "opinion/belief" questions (i.e. Appendix 2: Section C/D) that are more personal in nature and attempt to understand the cognitive and interpretive processes of the participant (Patton, 1987). Initially, the researcher used the critical incident technique (Flanagan, 1954) to understand the learning processes and experiences of each individual participant. Indeed, entrepreneurship researchers argue, the critical-incident-technique is particularly powerful to understand the stories of the entrepreneur and his/her venture (e.g. Chell and Pittaway, 1998; Deakins and Freel, 1998; Cope and Watts, 2000). Finally, the researcher left sensitive questions such as income, sales revenues, and profitability to end of the interview in order to build a rapport and minimise the risk of irritating the participant at an early stage of the interview.

Data Collection Phase One

In the first phase of data collection, the researcher conducted eight semi-structured interviews with medical technology firms. This included four firms in Scotland (e.g. Fertility, FemMed, StentGraft, and BioDevice) and four firms in Queensland (e.g.

PaceMaker, HeartBeat, SafeMed, BloodTrack). In each of these interviews, the researcher used Appendix 2 as a semi-structured interview guide. Each interview was scheduled for one hour, but Table 6-4 specifies the interviews were between 1 and 2.5 hours in length, which meant the average interview time was just over 1.6 hours in length. In each interview, location was dependent on participant convenience, which meant the researcher travelled throughout the Central Belt of Scotland and South East Queensland to conduct this field research. In Fertility and BioDevice interviews, the researcher's academic supervisor attended to help improve the reliability of the data collection (Gibbert et al. 2008). Prior to each interview, the researcher introduced the participant to Appendix 1, which is the *University of Glasgow: Code of Ethics*. The researcher then explained all data was strictly confidential and would be anonymised and verified prior to any public dissemination. The researcher also asked for permission to tape record each semi-structured interview, and in all cases, the entrepreneurs agreed to these protocols.

After these interviews, the researcher played back these digital recordings and took notes on his observations of the interview. Transcription of these data then took place quickly after these interviews. The researcher then discussed these observations with his academic supervisor to talk through the data. The researcher then began to collect secondary data in form of newspaper reports and monitoring the firm's website to gain a more holistic understanding of these data. Section 6.4.4 explains the researcher then progressed to the first stage of data analysis, which then led to the second phase of data collection.

Data Collection Phase Two

Figure 6-2 depicts after preliminary analysis and submission of the researcher's MSc dissertation, the researcher continued to explore the importance of networks and social capital. Consequently, the researcher designed a semi-structured interview guide to focus on these issues. Firstly, the researcher omitted StentGraft and PaceMaker from his initial sample. This was due to data access issues since StentGraft were no longer willing to participate in the research, while the entrepreneur of PaceMaker relocated to Texas, U.S.A. and were no longer available for interview. This meant in phase two, the researcher conducted semi-structured interviews with six of the eight case firms. In each case, the researcher interviewed the same respondent (e.g. CEO/founder) and initially asked the participant to confirm the validity of his initial findings. The researcher also followed the guidance of Chell and Pittaway (1998) and printed a timeline of the entrepreneurial firms'

chronologies on A3 piece of paper, listing all of the major events. In the first section of the interview, the researcher asked the participant to confirm the validity of these findings such as the sequence and content of each event. The researcher then asked the participant to provide an update on any events or developments since the interviews, where the researcher would list these events on the timeline "post-it" notes. This process helped triangulate initial findings as the participants would confirm or disconfirm the order and content of these chronologies.

Interestingly, section 6.4.4 reveals most of the participants identified the formation of certain network relationships as being critical events. Indeed, these findings correspond with Edvardsson and colleagues (Edvardsson and Strandvik, 2000; Edvardsson and Roos, 2001) research who argue for a relational based view of critical incident methodology. Specifically, Edvardsson and Strandvik (2000) found participants often described the formation of customer relationships as critical events. Consequently, the researcher followed the logic of "narrative sequence methods" (NSM) as a useful technique for theory development (e.g. Buttriss and Wilkinson, 2007). That is, these authors argue in the context of IE, the heart of NSM are to identify the underlying casual mechanisms or generative processes that unfold in new ventures. Consequently, Buttriss and Wilkinson (2007) argue that researchers should use NSM over a three stage-process. Although this is primarily an analytical technique, the authors argue the researcher should ask the entrepreneur to identify and map the narrative sequence of these unfolding events (Buttriss and Wilkinson, 2007).

Consequently, once the participant listed these new events, the researcher asked new questions about the firms' network relationships. This involved asking the participant to identify their most important ties who helped with commercialisation, growth, and international activity. The researcher then allocated different coloured "post-it" notes to each network relationship and placed this on the timeline. Finally, the researcher asked the participant to identify which network relationships were involved in specific events. This then encouraged the participant to discuss openly these events and facilitated the collection of rich narrative data. Thus, the second round of semi-structured interviews were more open ended with more emphasis on encouraging the entrepreneurs to speak openly and freely about a specific topic, which in this case was the role of social capital in NVI. Again, these interviews were tape recorded, transcribed, and ranged between 1 hour and 2.5 hours in length.

Finally, after the researcher built a relationship with the participants, he took advantage of some "snowball sampling" opportunities (e.g. Patton, 1987) as he conducted semi-structured and informal interviews with industry experts and policy makers. For example, HeartBeat's entrepreneur referred the researcher to policy makers in the Queensland Government, who then referred the researcher to a local business angel who was involved in the medical technology sector. Following the same protocols as above, the researcher then conducted semi-structured interviews with these participants. The researcher asked the participants to describe their experiences of the global medical technology sector and discuss what they felt were the core growth challenges for local medical technology start-ups. In addition to this, the researcher continued to collect secondary data on each of the case firms.

When the researcher returned to Scotland, he continued the second phase of data collection by attending local life science industry events, where he held informal conversations with policy makers and industry experts. The researcher then followed the advice of Delbridge and Kirkpatrick (1994) and wrote up these primary observations through a diary method as data collection and analysis progressed. During this phase, the researcher also conducted a semi-structured interview with a Scottish industry expert and replicated the same procedures as with the Australian participants. Finally, section 6.4.4 emphasises as the researcher progressed onto the third phase of analysis, he began to use theoretical sampling (Eisenhardt, 1989) as a technique to focus on the most theoretically rich cases, which then led to the third and final phase of data collection.

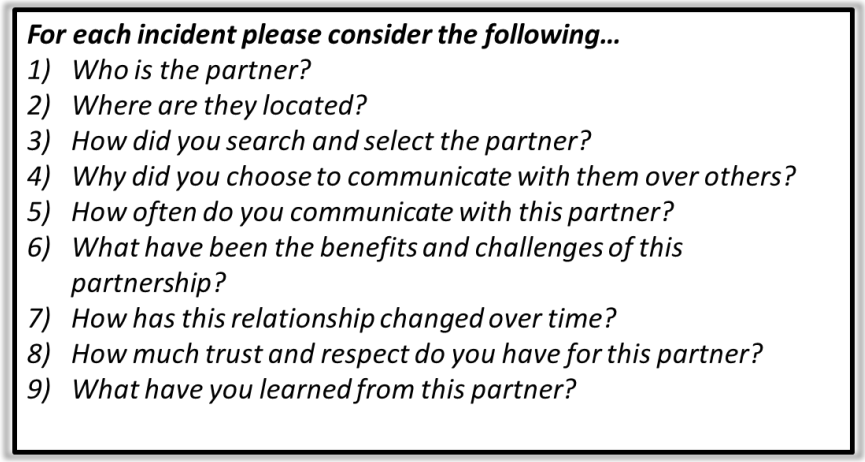
Data Collection Phase Three

Figure 6-2 depicts the final data collection phase was more refined and helped verify the emergent findings. Firstly, the researcher made the decision to select a theoretical sample of four cases. Given the richness of primary data and amount of secondary data, the researcher choose Fertility, HeartBeat, FemMed, and SafeMed as a theoretical sample. These firms were also what Eisenhardt (1989) terms as "theoretically interesting" as they were at various stages of international development and had different approaches to networking. Consequently, emergent findings also shown signs of various strengths of practicing certain networking activities, which helped support the data analysis.

Following the same protocols as phase two data collection, the researcher asked the participants to confirm the validity of his new findings. The researcher also asked each participant to provide an update of events since the last interview. Unfortunately, the

researcher was unable to conduct face-to-face interviews with the Australian firms due to being back in Scotland. Therefore, the researcher conducted a telephone interview with HeartBeat whose entrepreneur confirmed his findings. Nevertheless, the researcher was unable to pursue a follow-up interview with the CEO of SafeMed as he resigned due to an internal company dispute. However, given the weak performance of the firm, and available access to secondary data, due to their PLC status, the researcher made the decision to include SafeMed within the theoretical sample. Therefore, the major distinction between phase two and three semi-structured interviews is the researcher asked the participants to focus on specific network relationships and answer a list of pre-defined questions after their open discussion on these network relationships. Figure 6-4 illustrates the researcher then used "flash cards" (e.g. Bryman 2008) to help guide participants responses.

Figure 6-4: Research Flashcard



Source: The Author

As analysis progressed, the researcher continued to collect secondary data on these case firms. As the researcher began to identify gaps in these longitudinal data, phase three was an essential step to ensure the construct validity of these findings (Yin, 2003). Again, the researcher followed similar protocols as all interviews were tape-recorded and transcribed were possible, and ranged between 1 hour and 3 hours in length. Therefore, over this three-year period, total data collection amassed to 21 interviews, 35 hours of interview data, 5 days of observation and an extensive collection of secondary data mainly consisting of press reports and company documentation.

6.4.4 Data Analysis

The aim of this study's data analysis was to build theory from case study research (e.g. Eisenhardt 1989; Gioia et al. 2013). The researcher thus familiarised himself with high impact management contributions to gain an understanding for the "science" (e.g. Yin, 2004) and "art" (e.g. Stake, 1995) of theory building from case study research (e.g. Corley and Gioia, 2004; Maitlis, 2005; Nag et al. 2007; Maitlis and Lawrence, 2007; Ozcan and Eisenhardt, 2009; Hallen and Eisenhardt, 2012; Tippmann et al. 2012). In each of these contributions, the authors clearly state their analytical process. Therefore, this section aims to demonstrate how the researcher achieved his research objectives over a three-phase process.

Figure 6-2 illustrates the iterative nature of this study's data analysis. Firstly, Nvivo10© was used an organising tool during the three phases of data collection and analysis. The researcher found this software particularly powerful to slice and recode data, whilst identifying emergent themes across cases. Firstly, the researcher developed a set of narratives by constructing a chronological list of key events in each entrepreneurial firm. Secondly, the researcher identified various networking activities in each INV with the aid of conceptually ordered displays (Miles and Huberman, 1994) and wrote "thick descriptions" of each within-case firm (Eisenhardt, 1989). Thirdly, the researcher used cross-case analysis (Eisenhardt, 1989; Yin, 2003) to answer the final research questions by identifying the various conditions that enable networking capability development in NVI.

Data Analysis Phase One

In the first phase of data analysis, the unit of analysis was the *critical event* and researcher treated each firm as a standalone case. The researcher used Nvivo10© to organise the data analysis of each case firm. Firstly, the researcher created a separate "node" for each case firm and uploaded the transcripts of the semi-structured interviews into the Nvivo10© database. The researcher then sifted through the entrepreneurial narratives to construct a chronological list of key events, activities, and interpretations of them, which composed of raw data. The researcher then assigned descriptive codes to everything that seemed interesting about each technology start-ups growth and development. For example, this involved assigning "free nodes" to descriptive codes such as "strategic decision", "technology" "venture capital", "foreign market entry", "reputation", "delays", "suppliers" and so forth. In total the researcher initially allocated 78 free nodes which included a combination of descriptive and In-Vivo coding (Saldaña, 2012).

After this process, the researcher began to categorise the various events. In total, the researcher identified 256 events across eight case firms. This analytical process involved a combination of description and interpretation, as the participant entrepreneur identified most of the events. However, in some cases, analysis of these events was an interpretive exercise as the researcher identified events from the entrepreneurs' storytelling that they did not initially connect with being an important in their firm's history. For example, HeartBeat did not identify signing a co-R&D agreement with a US hospital as an event, although this was instrumental in their future entry into the US market. This is largely due to entrepreneurs who forget or downplay the importance of certain events and activities (Cope and Watts, 2000). Thus, following Chell and Pittaway (1998), the researcher categorised various incidents and identify those that were "critical" events. Flanagan (1954: 327) argues an incident is "critical" where "the purpose or intent of the act seems fairly clear to the observer and where its consequences are sufficiently definite to leave little doubt concerning its effect."

Therefore, the researcher initially sifted through this list of events and used "chronological coding" (Miles and Huberman, 1994) to identify "critical events" at specific points in time. Following Chell and Pittaway (1998), the researcher also assigned descriptive codes as to whether each event was proactive or reactive and whether they had a positive or negative influence on the firm. During this phase, the researcher also searched for secondary data

such as internal and external press reports, company reports, and website activity on these specific events to triangulate the respondents' descriptions to build "thicker" descriptions of each event. The researcher then returned to the firms and asked them to verify the validity of each event and confirm whether these interpretations were accurate. Chapter 7 provides a summary of each chronology of events.

Data Analysis Phase Two

The second data analysis phase was a challenging period for the researcher. During this time, the researcher had an instinctive feeling there was a gap between his theoretical framework and initial data analysis. In an effort to improve construct validity, the researcher's academic supervisor reviewed his initial findings who also felt his initial theoretical framework was insufficient to analyse his data. On reflection, this was partially due to the continued emergence of the dynamic capabilities perspective. For example, to begin with the researcher attempted to "pattern code" (Miles and Huberman, 1994) data by using Winter's (2003) capability hierarchy as lens to observe the "zero-level", "first-order" and "second-order" networking activities. As analysis progressed, the researcher found it particularly difficult to pattern code against these categories, and eventually realised that he was "squeezing" and "forcing" data into boxes – which Saldaña (2003) argues is a common practice amongst junior researchers.

This analytical challenge forced the researcher to return to the literature to consider a theoretical lens that would help make sense of data. This involved a phase of conceptual drift in which the researcher attempted to use Zahra and George's (2002) ACAP framework (i.e. acquisition, assimilation, transformation, and exploitation) and Teece's (2007) dynamic capability framework (i.e. sensing, seizing and reconfiguring) to pattern code his data. However, as the researcher initially attempted to write-up the within-case analysis by using matrix displays (Miles and Huberman, 1994) and "visual maps" (Langley, 1999), he realised these pattern codes did not fully reflect the raw data. This iterative process involved extensive meetings with the researcher's academic supervisor, where she would review his analysis and play the role of "devil's advocate" to ensure the refinement of the pattern codes (Eisenhardt, 1989).

As data analysis progressed, the researcher identified the opportunity to use Helfat et al. (2007) asset orchestration framework (i.e. create, extend, and modify) combined with Nahapiet and Ghoshal's (1998) social capital framework (i.e. structural, relational, and

cognitive) as an analytical lens to pattern code the data. A core reason for this decision to switch theoretical lens, was in combination with recent research (i.e. Autio et al. 2011) who argue that previous dynamic capability perspectives (i.e. Zollo and Winter, 2002; Teece, 2007) do not reflect the idiosyncratic processes of INVs (see sections 2.3.2 and 3.4).

During this abductive process, the researcher used this new theoretical lens to identify emergent themes surrounding networking and social capital. By this point, the researcher had collected another round of data, which provided fresh insight on the role of the INVs network relationships. By this stage, the researcher continued to use pattern coding, but the unit of analysis had shifted from the critical event to the *network relationship*, which required a more fine-grained analysis. Following this discovery, the researcher made the decision to use theoretical sampling to help refine his data analysis through the selection of four cases. Thereafter, the researcher followed the same protocols as in data analysis phase one, and used Nvivo10© to create separate nodes for each network relationship. The researcher then sifted through each narrative, consulting multiple raw data sources where appropriate to build a thick description of each individual network relationship with the use of new pattern codes. Table 6-5 summarises the eventual units of analysis across these four case firms.

Table 6-5: Summary of Events and Network Relationships

Nature of data collection	Number of events or network relationships				Total units of analysis
	Fertility	HeartBeat	FemMed	SafeMed	
Events	30	18	24	29	**101**
Type of network relationship					
Investors	6	4	1	1	12
Mentors	6	5	2	4	17
Buyers	5	2	4	2	13
Suppliers	1	2	2	4	9
Total number of network relationships	**18**	**13**	**9**	**11**	**51**
					152

Source: The Author

Guided by his emergent theoretical framework, the researcher developed pattern codes on nine combinations of how INV (1) create, (2) extend, and (3) modify their (a) structural, (b) relational and (c) cognitive social capital. By this stage, the researcher was then able to write-up the final within-case analysis. The researcher then used "conceptually ordered displays" (Miles and Huberman, 1994: 127) as a within-case analysis technique to structure this within-case analysis. This involved conceptually organising the displays by using columns to introduce the concepts (i.e. create, extend, modify, structural, relational and cognitive) and rows to present the empirical findings of each unit of data. Moreover, in line with

Saldaña (2003: 173) the researcher used "longitudinal coding" to chronologically categorise the use of each pattern code. Table 6-6 lists these final pattern codes.

Table 6-6: Pattern Codes from Phase Two Data Analysis

Category	Sub-Category	Code
Sources of social capital		
Create	Structural Social Capital [year]	C-STR [YEAR]
	Relational Social Capital [year]	C-REL [YEAR]
	Cognitive Social Capital [year]	C-COG[YEAR]
Extend	Structural Social Capital [year]	E-STR [YEAR]
	Relational Social Capital [year]	E-REL [YEAR]
	Cognitive Social Capital [year]	E-COG[YEAR]
Modify	Structural Social Capital [year]	M-STR [YEAR]
	Relational Social Capital [year]	M-REL [YEAR]
	Cognitive Social Capital [year]	M-COG[YEAR]
Effects of Social Capital		
Create	Benefits of social capital [year]	C-BEN [YEAR]
	Problems of social capital [year]	C-PRB [YEAR]
Extend	Benefits of social capital [year]	E-BEN [YEAR]
	Problems of social capital [year]	E-PRB [YEAR]
Modify	Benefits of social capital [year]	M-BEN [YEAR]
	Problems of social capital [year]	M-PRB [YEAR]
Change in Social Capital		
Increase	New to Weak [year a - year b]	INC-NW [YR-YR]
	New to Moderate [year a - year b]	INC-NM [YR-YR]
	New to Strong [year a - year b]	INC-NS [YR-YR]
	Weak to Moderate [year a - year b]	INC-WM [YR-YR]
	Weak to Strong [year a - year b]	INC-WS [YR-YR]
Decrease	Strong to Moderate [year a - year b]	DCR-SM [YR-YR]
	Strong to weak [year a - year b]	DCR-SW [YR-YR]
	Strong to deletion [year a - year b]	DCR-SD [YR-YR]
	Moderate to weak [year a - year b]	DCR-MW[YR-YR]
	Moderate to deletion [year a - year b]	DCR-MD [YR-YR]

Source: The Author

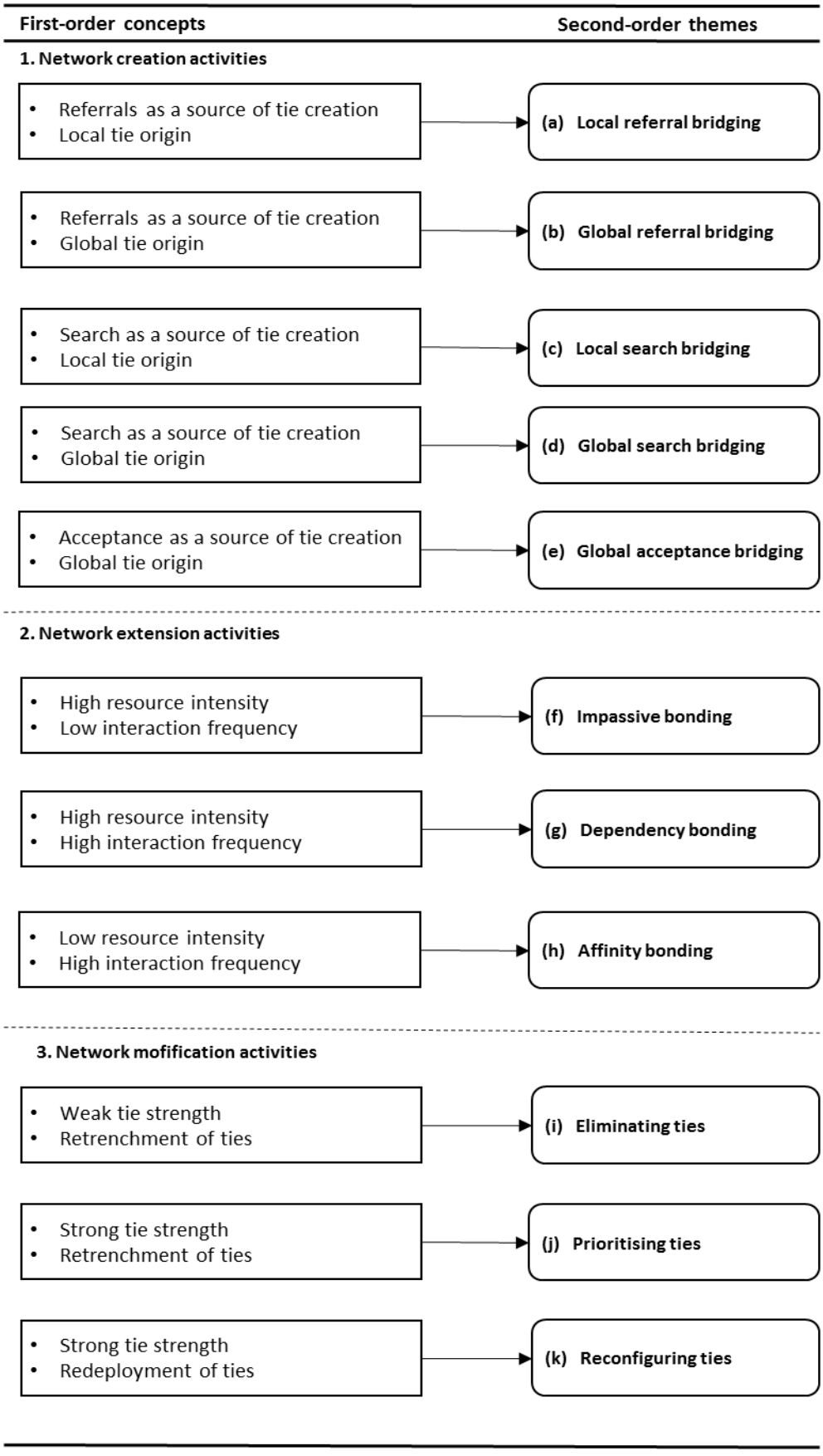
This coding structure then enabled the researcher to focus on the networking activities (i.e. the creation, extension, and modification of social capital) before, during, and after an INV's most critical event that unfolded during the time of data collection (2008-2012). By this point, the researcher was able to follow the guidance of Alder and Kwon (2002) by specifying whether certain structural, relational, or cognitive sources helped INVs create, extend, or modify social capital. Moreover, the researcher then examined these units of analysis in more depth to determine the benefits or problems – i.e. the effects – this social capital had on NVI. The researcher also used visual maps (Langley, 1999) as qualitative data analysis technique to triangulate these emergent findings. Following the write-up of the four individual case studies, the researcher was then able to progress to the final phase of data analysis.

Phase Three Data Analysis

The final phase of data analysis focussed on identifying the various networking activities that enable or inhibit NVI. More crucially, these emergent findings on specific networking activities were critical to understand the network-processes that underpin *networking capability development in NVI*. The researcher then engaged in a five-step analytical process that echoes Gioia et al. (2013) protocols to achieve a higher-level of abstraction. Firstly, the researcher used cross-case analysis to examine the patterns of *how* INVs *create*, *extend*, and *modify* their social capital across the four cases. Drawing on Table 6-6 pattern codes, the researcher complied a comprehensive list of network ties, and then engaged in first-order coding using the constant comparison method (Gioia et al. 2013). The researcher then linked similar types of network ties together such as investors, mentors, buyers, and suppliers to identify first-order concepts such as "referrals as a source of tie creation", "global tie origin," and "acceptance as a source of tie creation."

Secondly, the researcher took inspiration from Maitlis and Lawrence (2007) and used axial coding (Strauss and Corbin, 1990) by grouping these first-order concepts into second-order themes. In line Maitlis (2005), the researcher then used axial coding to search for *distinct* forms of networking. For example, when a network tie was sourced through a referral and its origin was global in scope, this formed a "global referral bridging" activity. The researcher then sharpened these second-order themes by comparing them with existing constructs in literature such as referrals (e.g. Burt, 2005) and international scope (e.g. Mors 2010). Following Maitlis (2005), the researcher then used data grids to experiment with various forms of axial coding. Figure 8-1 illustrates one outcome of this process. Figure 6-5 illustrates the progression and emergence of this theme building where the eventual outcome was eleven second-order themes emerged as aggregating several first-order concepts.

Figure 6-5: Progression of theme building

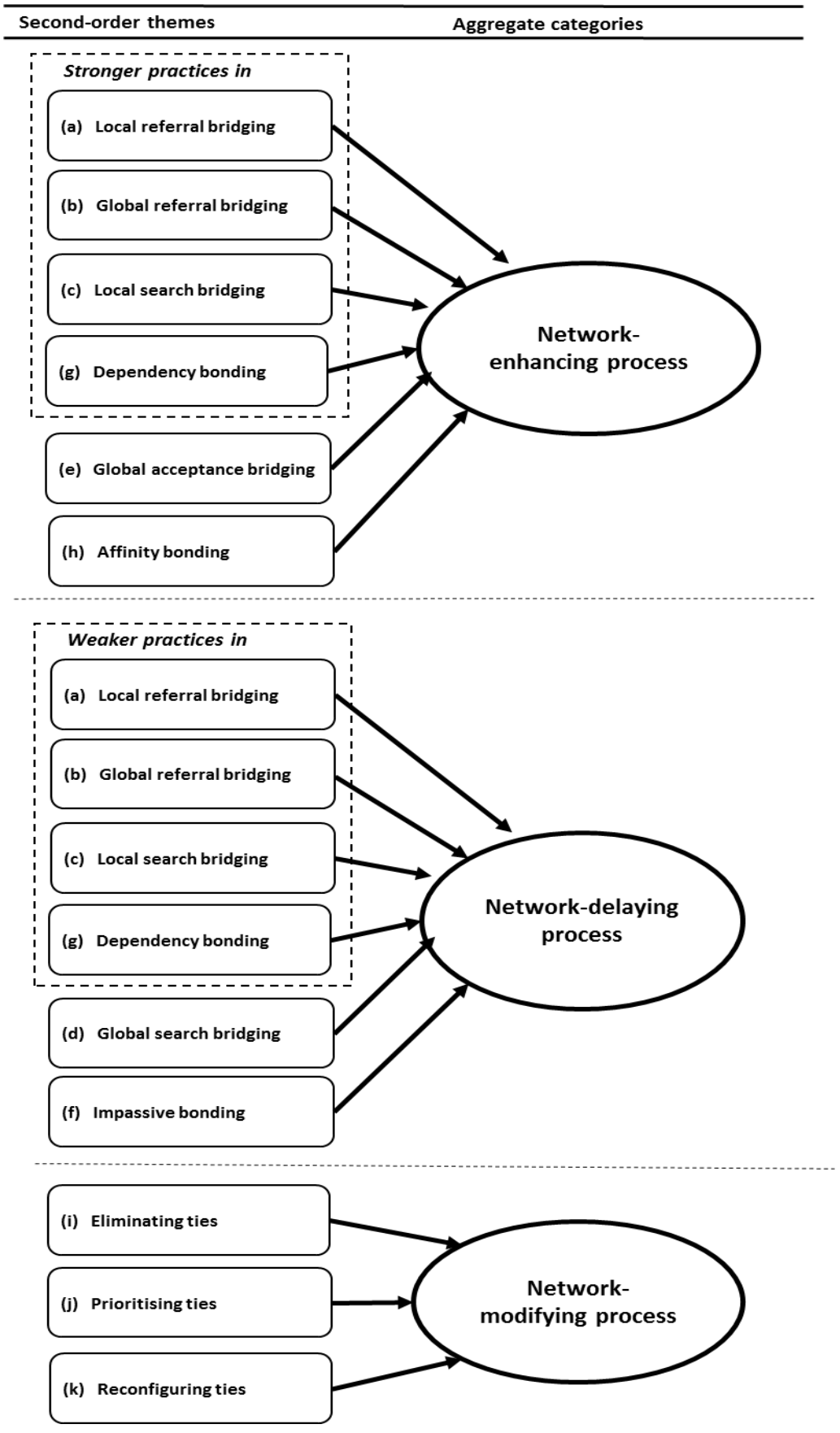


Source: The Author

Thirdly, the researcher crosschecked these second-order themes (e.g. networking activities) against the existing narratives and co-referenced raw data to verify the trail of evidence. For example, Table 8-1 provides representative second-order themes that help triangulate Figure 8-1's summary of findings. The researcher then replicated this process throughout the cross-case analysis. Fourthly, and in a third level of abstraction, the researcher sought evidence of *why* certain networking activities form a specific network-process. In accordance with Miles and Huberman (1994: 210), the researcher used "case-ordered effects matrices" to move beyond exploring and describing, to ordering and explaining. Figure 8-14 illustrates one example of case-ordered effect matrix. Most crucially, this analytical step helped the researcher determine *why* certain networking activities enable or inhibit NVI.

Interestingly, these case-ordered effects matrices helped the researcher identify three overarching aggregate categories. Through the combination of networking activities, the researcher found evidence of the (1) network-enhancing process; (2) network-delaying process; and (3) network-modifying process. Therefore, these three overarching dimensions aggregate eleven second-order themes, which aggregate several first-order concepts. Nevertheless, it is important to emphasise, these concepts emerged at the end of data analysis, in concert with relevant literature, which helped with the refinement of these findings. With these thoughts in mind, Figure 6-6 illustrates this study's overall data structure. The researcher then replicated the protocols set out in the third step, and created raw data tables for each aggregate category to provide another iteration between the raw data and this higher level of abstraction. Table 8-19 provides one example of this theoretical abstraction. Finally, in the fifth step of analysis, the researcher identified *cycles* of networking capability development. That is, the researcher examined the narratives for conditions that triggered, enabled, and accelerated networking capability development in the context of NVI. The analytical process then identified three important cycles (e.g. learning from delays, aspiring for internalisation and nurturing core ties) that help make a step towards *process theory networking capability development*. The researcher then discussed these abductive findings in relation to the literature to increase the validity and reliability of this case study research.

Figure 6-6: Data Structure



Source: The Author

6.5 Conclusion

To conclude, this chapter describes the research methodology chosen *to explore how technology start-ups build dynamic capabilities in networking to enable NVI*. To summarise, this chapter reveals this study adopts a phenomenological stance given the researcher's interpretivist epistemology. Therefore, this study follows an abductive approach based on a longitudinal multiple case study design (Eisenhardt, 1989; Leonard-Barton, 1990; Yin, 2003; Gioia et al. 2013). This chapter also details the purposeful and refined theoretical sample that drove this research. Moreover, this chapter explains that multiple sources of primary and secondary data inform this study. These data collection methods include semi-structured interviews, documents, and observation. The researcher also provides a deep insight into the process that underpinned his within-case and cross-case analysis. The next chapters now present the analysis and findings of this research.

7 – Within-Case Analysis: Summary of Events

Chapter Aim

To provide a summary of events for each case firm.

Chapter Objectives

- **To provide a summary of events for each case firm.**
- **To provide a context for the cross-case analysis.**

7.1 Introduction

This chapter provides a summary of events for each case firm. Given the "thick descriptions" of each individual case study and due to space limitations, these within-cases are available upon request. Therefore, this chapter summarises each case firm by providing a chronology of events. This chapter therefore provides context on each of the four cases, prior to an in-depth multiple case study analysis.

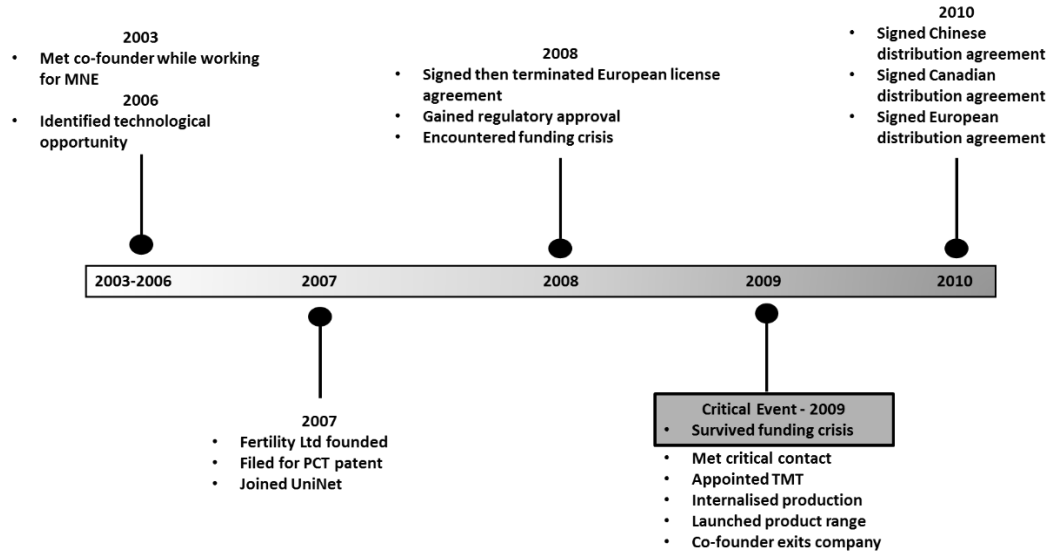
7.2 Case One – Fertility Ltd

Fertility Ltd was independently founded in October 2007 and is located in Edinburgh, Scotland. The company is a manufacturer of class one and two medical devices that focus on women's health and fertility. The company's core product is a clinically proven "fertility lubricant" that supports the motility and fertilising capacity of sperm. The core product targets couples who are trying to conceive and the firm offers supplementary products that include a moisturiser and a conception kit that aims to assist couples optimise the timing of conception. At the time of the final interview [2011], the company employed 10 full-time equivalent (FTE) staff, generated sales of £300,000 per annum, and had a gross profitability ratio of 75% of total sales for the financial year of 2010/2011. IBIS world (2011) reports the US fertility industry is valued at US$2 billion with an annual growth rate of 1.2% per year.

Prior to foundation, Californian entrepreneur Brad Davis met future co-founder Dr Zhan Shi in 2003 while working as Director of Operations for the UK subsidiary of Enhancement Corp an American medical technology MME. At the time, Dr Shi was an R&D director for Enhancement Corp and a leading academic scientist in the manufacture of biomaterials. Consequently, both actors worked on the successful commercialisation of a new cosmetic anti-aging product, which in 2006 led Dr Shi to discover a technological opportunity with respect to the manufacture of a specific biomaterial. Given that Dr Shi was one of only five scientists in the world who had the knowledge to manufacture this biomaterial, the actors decided to co-found Fertility in October 2007 to exploit this technological innovation [FER-I08-C]. The initial founding team of Fertility consisted of the CEO Brad Davis and Chief Scientific Officer (CSO) Dr Zhan Shi. At the time of founding, the CEO was a 34-year-old American male with a Master's degree in Biomedical engineering, an MBA, and 10 years operations management experience. The CSO was a 41 year-old Chinese-UK male with a PhD in biochemistry with 15 years combined academic and R&D experience in medical technology MNEs [FER-I08-C].

The respondent identifies that joining UniNet – a university led entrepreneurial network for local technology start-ups – was an important event in the foundation of the firm [FER-I08-A]. In early 2008, the respondent identifies that the co-founders filed for a Patent Cooperation Treaty (PCT) application that provides provisional patent rights in North America, Europe, and the Asia-Pacific [FER-I08-A]. However, in late 2008, the respondent emphasises how the firm encountered serious financial difficulty during the emergence of the global financial crisis (GFC) of 2007-2009. Figure 7-1 thus presents what the entrepreneur describes as the major events in the history of the firm.

Figure 7-1: Fertility Ltd Chronology of Events



Source: The Author

This meant the firm was unable to access seed-capital through bank finance or angel investment, and were motivated to pursue early sales revenues to ensure the firm's survival during the commercialisation process. This funding crisis triggered a string of networking activities in 2008-2009 in an effort to generate income such as attempting to license their core technology to European MNE, while attempting to build relationships with large venture capital funds and local business angel syndicates (BAS). Unfortunately, most of these networking activities were unsuccessful. By 2009, the firm had reached the brink of bankruptcy, but during this time, the entrepreneur met a "critical contact" who was instrumental in helping the firm survive this funding crisis. By mid-2009, this contact helped the firm secure early revenues through various sales channels, which enabled the generation of new income from a BAS that subsequently supported the commercialisation of the firm's

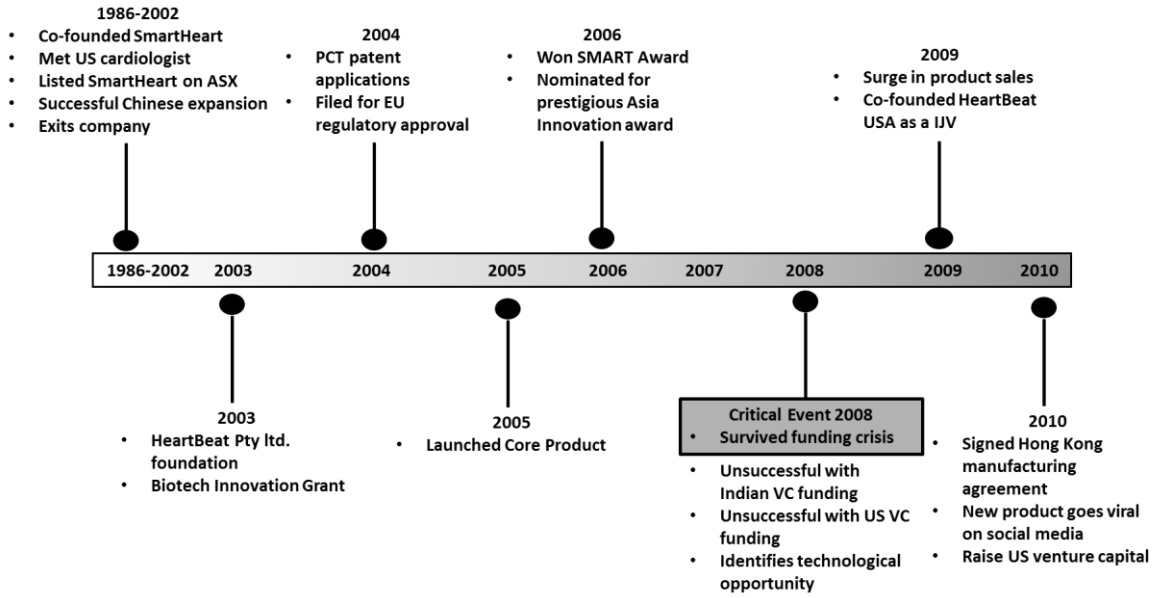
core product range. By 2010, the respondent confirmed Fertility had signed three foreign agreements with a large European, Chinese and Canadian distributor. It was then widely reported that the Chinese distribution agreement was worth an "estimated £70 million revenue" potential over the next seven years [FER-I11-A; FER-EPR10-E].

7.3 Case Two – HeartBeat Pty Ltd

HeartBeat Pty Ltd develop and manufacture a range of wireless and mobile health monitoring systems for the screening, diagnosis, and management of chronic diseases for the consumer health and fitness markets. HeartBeat are headquartered in Gold Coast, Queensland, Australia, and in 2009, established an international joint venture (IJV) with an American firm in Oklahoma City, Oklahoma, U.S.A. At the time of the final interview [2010], the respondent noted the company employed 3 FTE but did not reveal their sales or profitability ratio. However, the respondent did confirm that 95% of all its annual income was from international sales of medical technology hardware and software products within the global telemedicine industry. IBIS world (2012) reports the global telemedicine industry is currently valued at US$1.4 billion with a growth rate of 15% per annum.

HeartBeat Pty Ltd was independently founded in 2003. The company was founded to engage in a large-scale mobile telemedicine R&D project for a hospital in Baltimore, Maryland, U.S.A. The successful completion of this cross-border R&D project, led to the development of the firm's first product – a Bluetooth Heart Monitor – that allows end-users to send a personal ECG (electrocardiogram) of their heart rate electronically to a computer via Bluetooth technology. In late 2003, this innovative product led HeartBeat to win the Australian Government's prestigious Biotechnology Innovation Award providing the firm with a cash injection of AU$100,000 (£60,000) [HEA-I09-C]. In 2004, HeartBeat filed for a provisional patent for their wireless technology and filed for EU regulatory approval. Figure 7-2 thus presents what the entrepreneur confirmed as the major events in the history of the firm.

Figure 7-2: HeartBeat Pty Ltd Chronology of Events



Source: The Author

In 2005, HeartBeat filed for a PCT application and launched the Bluetooth Heart Monitor as their core product [HEA-I09-C]. The entrepreneur describes the firm initially decided to sell the heart monitor as an academic research device, which meant they were able to "avoid some regulatory hurdles" and generate immediate income [HEA-I09-C]. Consequently, the entrepreneur describes within one year, HeartBeat had sold 1000 units to universities and research consortia around the world who used the Bluetooth device to conduct academic research within the area of cardiology [HEA-I09-C]. In late 2005, HeartBeat then used this income to invent their second core product – the Bluetooth Pulse Monitor –, which at the time worked with the first Window's mobile phone [HEA-I09-C].

By 2006, these events resulted in the firm winning a Queensland Government SMART award and reaching the Hong Kong finals of the Wall Street Journal's prestigious Asia Innovation Award [HEA-CDA-F]. However, by late 2008, the respondent emphasises the firm encountered financial difficulty during the emergence of the GFC of 2007-2009. The entrepreneur describes that previous to the crisis the firm was "surviving" on government and innovation grants but these were "beginning to dry up" which meant HeartBeat were reliant on the limited sales of the Bluetooth Heart Monitor as the Bluetooth Pulse Monitor did not sell due to failure of the early Window's mobile phone [HEA-I09-C]. Thus, in 2008, this funding crisis triggered the firm to search for venture capital from a large Indian and US syndicate, but after 6 months of due diligence, both of these attempts were unsuccessful.

This crisis then triggered a sting of networking activities in 2008-2009 where the entrepreneur "fought for survival" [HEA-I09-C]. The respondent identifies in mid-2008 that he confided in his "life-long friend" and US cardiologist Dr Daniel Arthur for help on saving the business. Dr Arthur then invested in the business and identified that the emergence of Apple's iPhone as the "next big opportunity" within the telemedicine industry. Consequently, in 2009, academic researchers published their empirical findings on the "technological superiority" of HeartBeat's core product in a top-tier academic journal, which led to a surge in international sales. By mid-2009, this "surge in sales" had meant HeartBeat had survived this financial crisis. Furthermore, by late 2009, this chain of events motivated the entrepreneur to co-found HeartBeat USA as an IJV with US cardiologist in response to the emergence of Smartphone technology [HEA-I10-A].

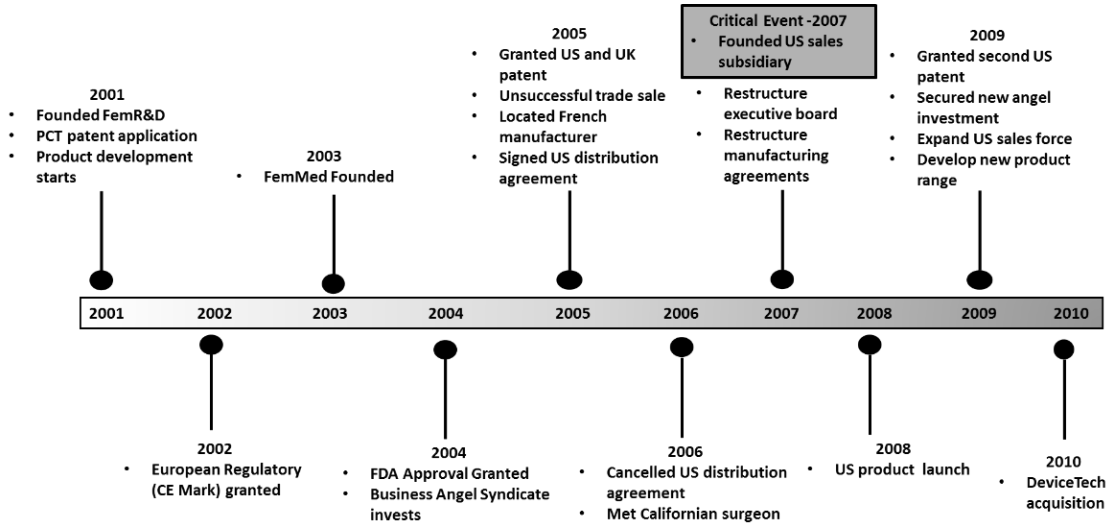
In early 2010, the founders of HeartBeat allocated their attention to the HeartBeat USA venture and focussed on the development of an ECG iPhone application. The founders then invented the software application in-house and searched for a suitable manufacturer who had the technological capabilities to develop new Smartphone hardware. By mid-2010, HeartBeat were successful in signing a production agreement with a "prestigious" Hong Kong MNE who specialise in the assembly of Smartphones and production of Smartphone accessories [HEA-I10-A]. This relationship then enabled the firm to develop a prototype of a unique facia that connects to a Smartphone and enables users to read, monitor, and electronically send their personal ECG to a nominated recipient such as a clinician or carer [HEA-I10-A]. By the end of 2011, HeartBeat had engaged in a successful social media campaign, which led to US TV coverage, which enabled them to raise US$10.5 million of venture capital prior to even receiving FDA approval [HEA-I11-A]. The firm continues to trade internationally under HeartBeat USA.

7.4 Case Three- FemMed Ltd

FemMed Ltd was independently founded in 2003 in Glasgow, Scotland and was the legal manufacturer of a range of "class three" medical devices that aim to restore female pelvic health. At the time of the final interview [2011], the company employed 30 FTE, generated sales of £2 million per annum with a profitability ratio of 75% of total sales for the 2010/11 financial year. The company derived 99% of its annual income from international sales of medical technology hardware products within the US *urology and gynaecology market* [FM-I11-D]. Frost and Sullivan (2008) report this US market is valued at US$2.4 billion with an

estimated annual growth rate of 13% per year [FM-EPR10-G]. Figure 7-3 depicts the major events in the history of the firm.

Figure 7-3: FemMed Ltd Chronology of Events



Source: The Author

Prior to foundation, Dr Philip Charlie a practising urogynaecologist set out to create a unique technological innovation in response to his concern about the quality and efficacy of existing surgical implants that aim to restore female pelvic health. In 2001, this medical concern motivated Dr Charlie to start-up FemR&D Ltd – an R&D company that focussed on exploring ways to improve malleability and efficacy of these surgical implants [FM-I08-A]. At this time, the founder was a practising surgeon and R&D director for a local MNE subsidiary that specialises in female health. Due to his surgical and commercial R&D experience, the founder invented a unique lightweight technology (FemTech) to develop superior surgical implants that were not currently available within the marketplace [FM-I11-C].

By late 2001, the firm had filed for a PCT application to protect this new technology, which subsequently led to the NPD of two core products. In 2002, FemR&D received European regulatory approval, which subsequently led to the foundation of FemMed Ltd in 2003. FemMed Ltd were therefore authorised to sell their products within the EU upon foundation. The initial founding team consisted of CEO and inventor Dr Charlie, and Chief Operations Officer (COO) Dr Catherine Styles who was responsible for quality and NPD. Both of the founding team had MNE experience and were educated to PhD or MBA level. That is, the

CEO was 47 years old at start-up with a Doctor of Medicine (M.D.) and an MBA, while the COO was 33 years old with a PhD in Chemistry, and had 10 years' operations management experience within a pharmaceutical MNE [FM-I08-D10]. Figure 7-1 thus presents what the COO described as the major events in the history of the firm.

In the initial 2008 interview, the respondent reports an important event was in 2004, when FemMed received its US regulatory (510k) approval to sell their products [M-I08-C]. This event triggered a local-based BAS to invest a "significant" sum of capital into the venture via partnership with Scottish Enterprise's Co-Investment Fund (SCF)[7]. The respondent did not reveal the equity share, but did divulge that the BAS invested on multiple occasions from 2004-2009 but did not reveal the amount. On further investigation, the researcher was able to confirm through various press reports that the BAS invested a total of £3.7 million over 5 years [FEM-EPR09-A; FEM-EPR09-B]. Consequently in 2005, FemMed were granted a US and UK patent, which triggered their early internationalisation. In 2005, the respondent confirmed their initial cross-border activities consisted of signing a French manufacturing agreement to subcontract the production of their products, and a US distribution agreement with a large MNE [FM-I09-B]. However, the following section will reveal that despite some initial sales, these cross-border activities were unsuccessful and threatened the firm's overall survival.

On review of the firm's critical events, the respondent confirmed the new venture's strategic decision to establish a US foreign sales subsidiary was the critical event that changed the direction of the firm and supported their international expansion [FEM-I11-B3]. Consequently, the respondent identifies that 2007 was the "turning point" in the new venture's history as FemMed were able to marshal enough financial resource to establish a foreign sales subsidiary in the US market [FM-I08-C]. In 2007, this decision involved the restructure of their executive board and a "significant commitment" to the US medical technology market. In 2008, FemMed officially launched their US product range and by 2009, this US sales subsidiary enabled the firm to secure additional venture capital, expand their product lines, and increase their US sales force [FM-I09-A]. Subsequently in 2010, these events led DeviceTech – a European MNE – to acquire FemMed in a deal worth £22 million [FM-I11-B1; FM-EPR10-D]. Incidentally, these data reveal that networking had a

[7] http://www.scottish-enterprise.com/fund-your-business/scottish-investment-bank/sib-equity-funding/scif.aspx [Last accessed 20/09/2013]

significant impact on the firm's rapid international growth, which is the focus of following cross-case analysis.

7.5 Case Four - SafeMed

SafeMed Plc. design and develop a range of safety medical devices within the syringe and blood collection device markets. SafeMed is headquartered in Gold Coast, Queensland, Australia. At the time of the final interview [2010], the respondent confirmed the company employed three FTE and were yet to generate sales revenues. The respondent confirmed that SafeMed were "in the process of entering the growth phase" as in 2010, they had just signed a US manufacture and distribution agreement with a potential value of "up to US$60 million sales per annum over the next five years" [SAF-I10-A]. SafeMed estimate that the US market for blood collection devices is valued at US$350 million per annum with a growth rate of 10% per annum. The firm estimates the US safety syringe sector is currently valued at US$100 million within the larger worldwide syringe market that is currently valued at US$2 billion per annum with a forecasted growth rate of 20% per annum [SAF-WC-A].

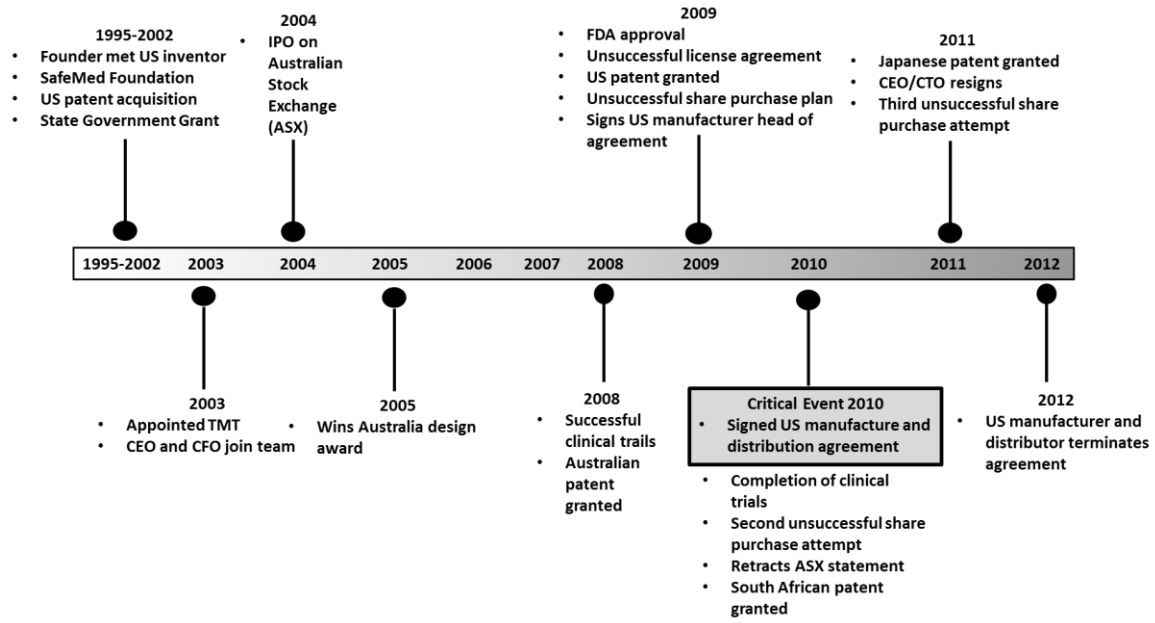
SafeMed Plc. were founded in 1999. Prior to foundation, Australian academic Dr Perry Christopher studied for a PhD in chemistry in the early 1980's at a US university where he met a fellow PhD student and US inventor. By 1995, Dr Christopher maintained contact with the US inventor due to his interest in the inventor's unique safety syringe technology that he was trying to commercialise. However, by 1998, the US inventor had "ran out of money" but Dr Christopher was such a "believer" in the commercial application of this technology that he raised funds in Australia to commercialise this technology [SAF-I09-C]. By mid-1998, Dr Christopher met local Australian property investor and entrepreneur Bruce Hanks who agreed to fund the acquisition of the inventor's US patent [SAF-09-C]. In 1999, the acquisition of these US patent rights led Dr Christopher and Bruce Hanks to found SafeMed in their home town, which is located in Gold Coast, Queensland. In 2000, SafeMed subsequently secured their first state government grant to drive the commercialisation [SAF-09-C]. By 2003, SafeMed used this government grant to appoint a formal TMT, which is when CEO Pat Eden and Chief Financial Officer (CFO) Pauline Branson joined the start-up team. Bruce Hanks then self-appointed himself as company Chairman, while Dr Christopher undertook the position of Chief Technology Officer (CTO).

By 2004, the CEO used his previous corporate law and investment banking experience to float SafeMed on the Australian Stock Exchange (ASX) [SAF-I09-C]. This IPO resulted in

SafeMed raising AU$4 million, which funded the firm's initial commercialisation activity [SAF-I09-A]. Following this IPO, SafeMed won a prestigious Australian design award, but led to a three year "quiet period" where the firm "focussed on commercialisation activity" [SAF-I09-C]. In 2008, the firm were successful with clinical trials and were granted an Australian patent for their safety blood collection device. In 2009 – ten years after foundation – the firm were granted FDA approval for their blood collection device. The firm then began to pursue licensing agreement with a US medical technology MNE [SAF-I09-B]. However, in February 2009 this agreement was unsuccessful which "forced the firm to change their strategy" [SAFE-I10-B].

In March 2009, SafeMed returned to shareholders with a "shareholder purchase plan" in an attempt to raise an additional AUS$2 million to fund the firm's commercialisation. However, this shareholder purchase plan only raised AUS$300,000, but did keep the business afloat [SAF-IPR-09-A]. By late 2009, the firm were granted a US patent for their blood collection device, which provided them with the confidence to enter the US market to secure strategic partnerships with a manufacturer and distributor. During this time, SafeMed started initial negotiations with a US manufacturer but this deal broke down due disagreement on various contractual terms [SAF-I10-B]. Eventually however in late 2009, SafeMed signed a US distribution and manufacturing heads of agreement [SAF-I10-A]. In the 2010 interview, the CEO confirmed that SafeMed had signed a US manufacture and distribution agreement, which he identified as the major critical event in the history of the firm. Figure 7-3 thus presents what the CEO confirmed as the major events in the history of the firm.

Figure 7-4: SafeMed plc. Chronology of Events



Source: The Author

Following this critical event, the CEO confirmed with the researcher that the US manufacture and distribution agreement was contingent on the firm raising new capital to pay for the manufacturer's specialised equipment [SAF-I10-B]. Consequently, in July 2010, SafeMed attempted a second shareholder purchase plan to raise new capital, but despite these advancements, the shareholders failed to invest in the company [SAF-EPR10-A]. By August 2010, this unsuccessful attempt to raise new capital triggered a stream of events. Firstly, in August 2010 the ASX told the CEO to "retract" his announcement that SafeMed had signed an agreement "worth up to US$60 million" as these claims were "unfounded" and "misled" shareholders on the potential value of this agreement [SAF-IPR10-B].

In April 2011, the CEO resigned for "personal reasons" but it was widely reported the CEO agreed to exit the company due to these unfortunate chain of events [SAF-EPR11-A]. Thirdly, directly after the CEO's departure, the CTO exited the company "in pursuit of an academic career" [SAF-IPR11-B]. Fourthly, in December 2011, SafeMed reattempted to raise a share purchase plan, which again was unsuccessful, which led the US manufacturer in January 2012 to terminate this agreement due to the firm's inability to raise capital to purchase the specialised equipment [SAF-EPR12-A].

7.6 Conclusion

To conclude, this chapter provides a short description and summary of events for each case firm. The purpose of this chapter was to provide a context for each firm prior to the cross-case analysis. This chapter therefore identifies that Fertility and HeartBeat both identified surviving an internal funding crisis during the global financial crisis of 2008-2009 as a major critical event in the history of each firm. Additionally, FemMed and SafeMed both identified their foreign market entry into the US medical technology sector as a major critical event. These events therefore structure the forthcoming cross-case analysis as this research aims to explore how INVs create, extend, and modify their social capital before, during, and after these critical events. This forthcoming cross-case analysis provides the researcher with the ability to analyse the temporal issues that underpin networking capability development in NVI.

8 .Cross-Case Analysis and Emergent Findings

Chapter Aim

To analyse and report the cross-case findings on how technology start-ups build dynamic capabilities in networking to enable their new venture internationalisation.

Chapter Objectives

- **To achieve research objective one by reporting how INVs create, extend, and modify their social capital in high-technology markets.**
- **To achieve research objective two by reporting why specific networking activities enable or inhibit new venture internationalisation in high-technology markets.**
- **To achieve research objective three by reporting which network processes underpin networking capability development in new venture internationalisation.**

8.1 Introduction

This chapter aims to analyse and report the cross-case findings on how technology start-ups build dynamic capabilities in networking to enable their NVI. This chapter therefore intends to achieve three objectives. Firstly, this chapter seeks to achieve research objective one by reporting on how INVs create, extend, and modify their social capital in high-technology markets. Research questions one, two, and three will therefore seek to achieve this objective. Secondly, this chapter seeks to achieve research objective two by reporting on why specific networking activities enable or inhibit NVI in high-technology markets. Research question four will therefore seek to address this objective. Finally, this chapter seeks to achieve research objective three by reporting on which network processes underpin networking capability development in NVI. Research question five will therefore seek to achieve this objective. Finally, this chapter will conclude with a summary of key findings.

8.2 RQ1: How do INVs create social capital?

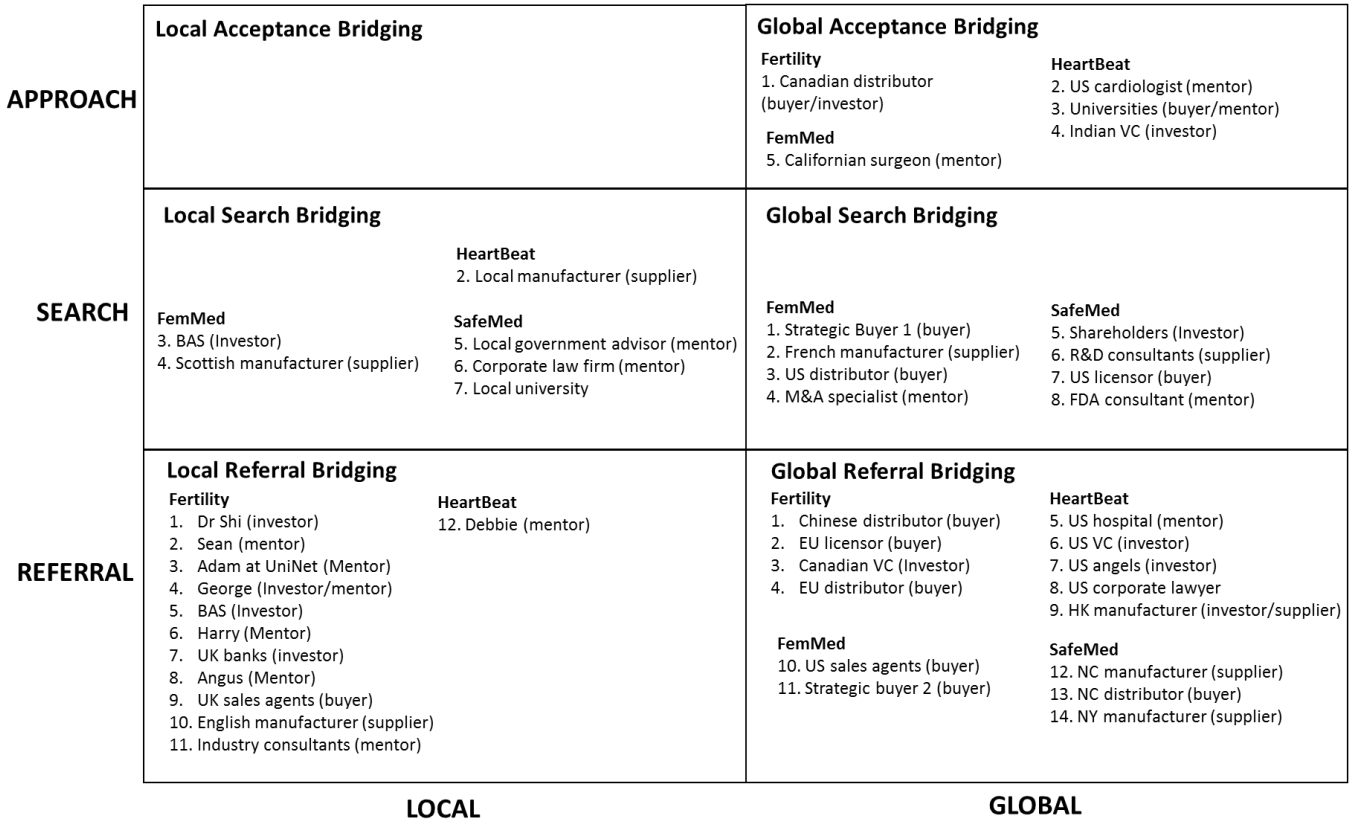
This section reports the cross-case findings on how INVs create social capital. In accordance with Miles and Huberman (1994), the researcher uses a range of data displays to examine how INVs create social capital. It is also important to emphasise the following data displays are aggregates of Appendix 5, which present a more granular cross-case data analysis. To draw useful comparisons and contrasts between each case firm, the researcher categorises the INVs social capital based on forming ties with (1) investors, (2) mentors, (3) buyers, and (4) suppliers. Figure 6-6 presents the overall data structure of this research, which indicates the researcher had found across cases that INVs engage in five central networking activities to create social capital. Consequently, Figure 6-5 illustrates these five networking activities emerged as second-order themes that aggregate several first-order concepts. These second order themes are categorised as "bridging activities" which consist of (1) local referral bridging (LRB), (2) global referral bridging (GRB), (3) local search bridging (LSB), (4) global search bridging (GSB), and (5) global acceptance bridging (GAB). Table 8-1 presents representative data of each second-order theme, while Figure 8-1 summarises the cross-case findings on how INVs create social capital. The remaining data displays provide a cross-case comparison on how INVs create social capital with investors, mentors, buyers, and suppliers, which the researcher explains in detail within the following sections.

Table 8-1: Representative Data supporting Second-Order "Bridging" Themes

Second-order theme	Representative Data
Local referral bridging	Fertility: LRB3 We used another guy through [Adam]... another link through [Adam] on that matrix that you've got for all the networking I did. There's a guy named [George]. He was also a mentor of ours. So, when he...When you're on [UniNet] you're supposed to select a mentor. Well, a lot of people choose mentors in their own field but I developed a team from all over areas, so I had everything covered. So, I chose a mentor called [George] that didn't know anything about my business. He just knew about struggles of being an entrepreneur and so [Adam] ended up helping us make that decision [FER-I09-B5].
	HeartBeat: LRB12 Debbie is the coordinator for the Queensland Government. She is very nice and I regularly meet with her. The local government actually introduced me to her and I'm sure she would be most interested to hear about your project and provide assistance. Call her and let her know I sent you [HEA-CDC-A]!
Global referral bridging	Fertility: GRB1 [Zhan] is so well connected in China. China does not work on English law it works on relationships, you know people will not go and sell you out. So if you've got good friendships and people you can trust that you have had for a couple of years, they won't sell you out there's a loyalty there, so we're banking on that to help our company's entry into China [FER-I08-A].
	HeartBeat: GRB7 [Dr Arthur] has all the connections and everything, so he and I decided to set up a new company just to do all this stuff with the iPhone. So he and I took fifty percent each right, and we got fifty grand from some angel investors, who are just friends of [Daniel's] who I met previously. They put in the fifty grand but they actually gave us the money doing the classic American angels, they are just [Daniel's] friends and made money from his previous companies before, they just singed cheques – let's just figure out the structure later [HEA-I10-A].
Local search bridging	FemMed: LSB4 It was at technology fairs that we identified key subcontractors. And in actual fact, it just so happens that our main subcontractor are local, and we weren't aware of them before we went to the [US] technology fair. You know, it is quite a complex networking activity in the UK, so consultant word of mouth and technology fairs were the main ones [FEM-I09-B1].
	SafeMed: LSB6 So we went around and seen people who we thought were the right calibre as we didn't want one of the big guys, we wanted a second-tier firm who we knew could help us. So we selected them on the basis of personality and capability. Well number one capability – can they do the job. Number two, experience have they done it before. Number three, I guess personality, in other words do you think you can work with these guys are they good guys. Number four, fees – what is it going to cost us [SAF-I10-B].
Global search bridging	FemMed: GSB3 How did we search and select this partner, good question, I think we employed a sales director in the States who really put an advert I think or used his contacts to see if there was any distribution companies who would be interested in selling [FemMed] products. So you really have got to choose someone in the know who has the network and that is what we did [FER-I10-C].
	SafeMed: GSB8 But more recently is identifying, which we think we've kind of now done, a [foreign] manufacturer who will take us forward, and a series of [foreign] distributors who will take us forward. So that will be a key alliance for us in the future, and fundamental, really. Our FDA consultant, the guy who actually helped us get our FDA, and his people has helped us search for these partners [SAF-I09-A].
Global acceptance bridging	Fertility: GAB1 The Canadian guys [Canadian distributor] got in contact with us and I signed a contract with them about 6 months ago, and they called us up and said look boys we'd love to sell your products and it pretty much evolved from there [FER-I10-A].
	HeartBeat: GAB3 I've been in the wireless health telemedicine space for 20 years. We really see ourselves as innovators in the space and I think that's demonstrated in that most of our customers at the moment are really the research groups around the world. We have about 150 research groups as customers, in I think, over 30 countries now, and they all get in touch with us when they are looking to buy product [HEA-I09-A].

Source: The Author

Figure 8-1: Network Creation Activities: Summary of Findings



Source: The Author

8.2.1 The Creation of Investor Social Capital

Table 8-2 reports on how INVs create investor social capital. Firstly, the cross-case analysis shows that three (Fertility, HeartBeat, FemMed) of the four INVs initial networking activities focussed on forming ties with individual or organisational investors. For example, Table 8-2 specifies that Fertility attempted to form multiple ties with investors – specifically eight investment ties – that consisted of local individual angel investors along with commercial organisations such as the UK banks, a local BAS, and a large Canadian VC syndicate. HeartBeat's networking behaviour was also similar due to their attempts to form investment ties with both an Indian and US VC syndicate, along with a group of individual US angel investors. By contrast, FemMed's networking with investors was less intensive and more focussed as they made the early decision to form ties with Harmony – a local BAS – rather than pursuing multiple forms of VC and angel funding. Finally, the cross-case findings show that SafeMed differs from the above case firms, as they believed raising venture capital was a "waste of time" and decided to pursue an IPO.

Of all four INVs, SafeMed were the only the INV to pursue an IPO on the ASX in comparison to Fertility and HeartBeat who were both explicit they had no interest in pursuing an IPO. For example, HeartBeat's founder tells a story that he had previous experience of floating a medical technology start-up on the ASX called SmartHeart, but due to the loss of company control, he decided to "avoid" the IPO route. Relatedly, Fertility in their initial interview specified they had "no interest in going IPO" as they wanted to "keep company control" and over next 15 years become "one of the leading medical device companies in the world." Additionally, FemMed in their first interview discussed an IPO as "potential strategic exit" but emphasised the initial importance of forming ties with the BAS to grow the firm. FemMed's entrepreneur then specified they would consider an IPO on London's Alternative Investment Market (AIM), but would only consider that as an option for gaining a strategic exit for the founding team.

Table 8-2: The Creation of Investor Social Capital

Tie	Tie Type^	Source of tie creation	Tie origin˘	Initial access to information or resources	Future referrals	Network creation activity†
Fertility						
Dr Shi	◐	Referral	Local	Co-founded venture and discovered technological opportunity	Yes	LRB
Canadian VC	●	Referral	Global	None	No	GRB
UK banks	●	Search	Local	Banks were unable to provide finance	No	LRB
Oxford angels	◐	Search	Local	Oxford angel investors only invest in local start-ups	No	LSB
BAS	●	Referral	Local	BAS provided entrepreneur with early seed capital	No	LRB
Canadian distributor	●	Approached	Global	Canadian distributor agreed to fund Canadian regulatory approval	No	GAB
HeartBeat						
Indian VC	●	Approach	Global	None	No	GAB
US VC	●	Referral	Global	None	No	GRB
US angels	◐	Referral	Global	US angels provided entrepreneur with seed funding, emotional support, and access to US networks	Yes	GRB
HK manufacturer	●	Referral	Global	Hong Kong manufacturer funded the firms initial production of a prototype	Yes	GRB
FemMed						
BAS	●	Search	Local	BAS invested seed capital and provided the firm with emotional and business support	Yes	LSB
SafeMed						
Shareholders	◊	Search	Global	An IPO led to an initial investment of AUS$3 million	No	GSB

^ Following Fernhaber and Li (2013), the author considers three types of ties. Thus, "◐" represents an inter-personal tie, "●" represents an inter-firm organisational, while "◊" represents multiple ties which form a network.

˘ The author examines tie origin on whether the connection formed locally or globally. Following Tippmann et al. (2012) the author uses the term "global" loosely to avoid complexity by incorporating various levels of international scope.

† Figure 8-1 illustrates the following network creation activities emerged as second-order themes via data analysis. Thus, "LRB" refers to local referral bridging, "GRB" refers to global referral bridging, "LSB" refers to local search bridging, "GSB" refers to global search bridging, "LAB" refers to local acceptance bridging, while "GAB" refers to global acceptance bridging.

Source: The Author

Table 8-2 and Appendix 5A also show that each INV drew on various "structural sources" to create social capital with investors. Table 8-2 indicates the INVs either relied on (1) referrals; decided to (2) search for new contacts; or actors (3) approached the firm with a collaboration interest. Moreover, these "bridging activities" either occurred at a local or global level. For example, Appendix 4 indicates that Fertility's entrepreneur relied on Adam at UniNet – a local government sponsored university support network – to refer his firm to a local BAS. By contrast, HeartBeat used referrals as a mechanism to create social capital but within a global context. For example, HeartBeat's entrepreneur drew on his inter-personal links (i.e. his friendship) with a US cardiologist to form ties with a US VC syndicate then subsequently formed ties with a US group of angel investors. For example, quotation GRB7 within Table 8-1, illustrates this GRB activity as HeartBeat's entrepreneur tells a story that:

> American angels, they are just [Daniel's] friends and made money from his previous companies before, they just signed cheques – let's just figure out the structure later. HeartBeat [HEA-I10-A].

Fertility also show some signs of GRB as Adam at UniNet referred the firm to a Canadian VC syndicate. Table 8-2 also indicates that three (Fertility, FemMed and SafeMed) of the four firms searched for potential investors within new or existing networks. For instance, both FemMed and SafeMed searched for investors within new networks. In FemMed's case, the firm searched for a BAS locally and selected Harmony as their core investor as the entrepreneur believed: "We looked at VC's and we looked at Angels [BAS], and we felt that we would have more control over the business and there was more support from an angel company than a VC [FEM-I11-B3]." Similarly, Fertility searched within a local mentors existing network and identified angel investors in Oxford, England as potential investors. However, this networking activity was unsuccessful as the entrepreneur discovered the angels "only invest in local start-ups." By contrast, the only evidence where INVs used GSB to create investor social capital was in the case of SafeMed, who decided to use an IPO as a platform to search for global investors, which initially raised AUS$3 million of start-up capital.

Table 8-2 also specifies that HeartBeat where the only INV who were directly approached by an investor who expressed an interest to invest in the company. In this example, an Indian VC syndicate learned of Fertility's unique technology due to their nomination for the prestigious Wall Street Journal Asia Innovation Award, which triggered a stream of early investor interest. The entrepreneur then tells a story that he was very "reluctant" to accept VC offers, but due to the emergent GFC, he accepted the VC's initial offer to start negotiations. This networking activity shows signs of GAB, as the INV's involvement in global R&D networks and ownership of a unique technology were sources that encouraged potential investors to collaborate with the firm.

Finally, Table 8-2 indicates that most INVs were unable to use their initial investor social capital for the purposes of future bridging activities. Fertility, for example, failed to form long-standing ties with most investors, which indicates any initial social capital did not help with forming future connections. This is also apparent in HeartBeat who were unable to form long-term ties with the Indian and American VC, which left no future bridging opportunities. Interestingly, SafeMed's decision to form ties with shareholders provided no future bridging opportunities. However, HeartBeat and FemMed's decision to create social capital with

angel investors did pay dividends as both firms benefited from their angels referring them to new local and global contacts. Overall, these findings show that these INVs did engage in multiple "bridging" activities to create investor social capital.

8.2.2 The Creation of Mentor Social Capital

Table 8-3 reports on how INVs create mentor social capital. Firstly, the cross-case analysis shows that all firms formed ties with mentors at some stage in their international development. Interestingly, both Fertility and HeartBeat discuss the importance of forming ties with mentors at early start-up, while FemMed and SafeMed discuss tie formation with mentors later on in their international development. For example, Table 8-3 specifies that Fertility formed four mentor ties that consisted of local entrepreneurs who were predominately involved in the life sciences industry. Whereas, HeartBeat's networking with mentors differed as it primarily involved American ties that were both inter-personal (i.e. a US cardiologist) and inter-organisational (i.e. universities). For example, these ties approached the entrepreneur as they had similar R&D interests within the telemedicine industry. Similarly, FemMed also formed ties with a Californian surgeon who approached the firm and acted as a mentor and key opinion leader (KOL) when the new venture expanded its involvement in the US medical technology market. SafeMed also formed ties with an American FDA consultant to help with regulatory approval, who as the relationship developed mentored the firm on their entry into the US market.

Table 8-3: The Creation of Mentor Social Capital

Tie	Tie type^	Source of tie creation	Tie origin˅	Initial access to information or resources	Future referrals	Network creation activity†
Fertility						
Sean	◐	Referral	Local	Sean introduced entrepreneur to many contacts	Yes	LRB
Adam at UniNet	◐	Referral	Local	Adam provided the entrepreneur with seed capital and business support	Yes	LRB
George	◐	Referral	Local	Local angel investor also provided entrepreneur with emotional and business support	No	LRB
Harry	◐	Referral	Local	Local mentor provided entrepreneur with access to global networks, emotional and business support	Yes	LRB
Angus	◐	Referral	Local	Local mentor is the VP of MNE subsidiary who provided emotional and business support	Yes	LRB
HeartBeat						
US cardiologist	◐	Approached	Global	US cardiologist built instant friendship with entrepreneur providing emotional support	Yes	GAB
US hospital	●	Referral	Global	US hospital was the coordinator of a R&D project the entrepreneur became involved in.	Yes	GRB
Debbie	◐	Referral	Local	Debbie a local government advisor provided the entrepreneur with access to government grants	Yes	LRB
Universities	◊	Approached	Global	Universities around the world supported the entrepreneur with R&D and were the firm's major customer	Yes	GAB
US corporate lawyer	◐	Referral	Global	US corporate lawyer provided legal advice on contractual negotiations in the US and Hong Kong	Yes	GRB
FemMed						
Californian surgeon	◐	Approached	Global	Californian surgeon provided access to US hospitals and became a key opinion leader for their product	Yes	GAB
M&A specialist	●	Search	Global	M&A specialist provided advice on acquisitions and secured a buyer.	No	GSB
SafeMed						
FDA consultant	◐	Search	Global	FDA consultant provided business support on FDA approval	Yes	GSB

^ Following Fernhaber and Li (2013), the author considers three types of ties. Thus, "◐" represents an inter-personal tie, "●" represents an inter-organisational tie, while "◊" represents multiple ties which form a network.

˅ The author examines tie origin on whether the connection formed locally or globally. Following Tippmann et al. (2012) the author uses the term "global" loosely to avoid complexity by incorporating various levels of international scope.

† Figure 8-1 illustrates the following network creation activities emerged as second-order themes via data analysis. Thus, "LRB" refers to local referral bridging, "GRB" refers to global referral bridging, "LSB" refers to local search bridging, "GSB" refers to global search bridging, "LAB" refers to local acceptance bridging, while "GAB" refers to global acceptance bridging.

Source: The Author

Table 8-3 and Appendix 5 also show that each INV drew on various "structural sources" to create social capital with mentors. Table 8-3 indicates that the INVs predominately relied on (1) referrals and (2) search to create social capital with new mentors. However, on separate occasions in both HeartBeat and FemMed a US mentor approached each firm as they held a personal medical interest in the firm's medical technology. Indeed, Figures 7-2 and 7-3 within the Fertility case provide clear evidence the entrepreneur relied on LRB to form ties with mentors. For example, quotation LRB3 within Table 8-1 provides evidence of LRB as the entrepreneur tells a story whilst on Adam's UniNet programme:

> So I chose a mentor called [George] that didn't know anything about my business. He just knew the struggles of being an entrepreneur and so [Adam] ended up helping us make that decision [FER-I09-B5].

HeartBeat also used LRB to form ties with Debbie a local government advisor who helped the entrepreneur gain access to government grants. However, the majority of HeartBeat's networking with mentors was international in scope. For example, HeartBeat's entrepreneur used his friendship with Dr Arthur a US cardiologist to form ties with a US hospital to conduct R&D within telemedicine. Moreover, HeartBeat also used their social capital with this US cardiologist to source a US corporate lawyer who provided legal guidance on internationalisation in North American and Asian markets.

Table 8-3 also indicates that on only two occasions INVs searched for mentors within new or existing networks. For instance, both FemMed and SafeMed searched for mentors within new foreign networks. In FemMed's case, the firm used GSB to locate an M&A specialist who had the acquisition capabilities to identify and secure a suitable strategic buyer who could acquire the firm. Interestingly, section 8.2.3 reports that FemMed originally used GSB to locate a strategic buyer, but after unsuccessful due diligence they soon realised they did not have the sufficient capabilities to negotiate a trade-sale. Therefore, the entrepreneur tells a story that they had learned from this experience and decided to search for a US M&A specialist who could support them through the acquisition process. Similarly, SafeMed also used GSB to form ties with a US FDA consultant, and the creation of this new social capital initially supported their entry into the US market.

Finally, Table 8-3 indicates that all of the INVs were able to use the majority of their initial mentor social capital for the purposes of future bridging activities. For example, Fertility relied on Harry and Angus – who are influential life science entrepreneurs – endorsements and referrals to help create new social capital with local and global customers. Moreover, HeartBeat's entrepreneur also relied on his friendship with the US cardiologist to connect with American hospitals, mentors, customers, and suppliers. These networking activities were also apparent in FemMed, as after they formed a tie with a Californian surgeon, he became a KOL who promoted the efficacy of their products at US trade fairs and within US hospitals. Lastly, SafeMed also used their global connection with their FDA consultant to create new social capital with American suppliers (e.g. manufacturers) and distributors who shown an initial interest in forming strategic alliances with the firm. These findings then

indicate that INVs engage in multiple networking activities both locally and globally in order to create mentor social capital.

8.2.3 The Creation of Buyer Social Capital

Table 8-4 reports on how INVs create buyer social capital. The cross-case findings show that all firms attempted to form ties with potential buyers (i.e. customers) which consisted of sales agents, foreign distributors, foreign licensors, and strategic buyers (i.e. acquirers). The researcher also found that all of the INVs engage in a diverse range of networking activities to create buyer social capital, where most of which was global in scope. For instance, Table 8-4 reports that Fertility attempted to create buyer social capital with one Chinese, one Canadian, and two European MNEs. Relatedly, HeartBeat's founder indicates that his firm had created social capital with "150 research groups as customers, in, I think over 30 countries now [HEA-I09-A]", while forming a customer tie with a Hong Kong MNE. By contrast, Table 8-4 indicates that FemMed and SafeMed's buyer social capital was more international in scope, since both INVs were specifically involved in US medical technology markets. That is, FemMed attempted to create initial social capital with a strategic buyer who was a US MNE, then subsequently with a US MNE who agreed to distribute their products. Finally, SafeMed also attempted to create social capital with US customers as they formed initial ties with a US MNE in an attempt to encourage them to sign a foreign license agreement, and subsequently with a medium-sized US distributor.

Table 8-4 and Appendix 5A indicate that each INV drew on a combination of "structural sources" such as referrals, search, and being approached to create buyer social capital. To begin with, Table 8-4 specifies that all firms used GRB to create buyer social capital. For example, this cross-case analysis along with Appendix 4 provides clear evidence that Fertility were the most intensive in using GRB to form MNE ties with a Chinese distributor along with a European licensor and distributor. Quotation GRB1 within Table 8-1 is one notable piece of evidence of GRB as Fertility's entrepreneur tells a story of how he has used his Chinese co-founders ethnic network to create social capital with a Chinese MNE. The entrepreneur explains:

> [Zhan] is so well connected in China. China does not work on English law it works on relationships, you know people will not go and sell you out. So if you've got good friendships and people you can trust that you have had for a couple of years, they won't sell you out and there is a loyalty there, so we're banking on that to help our company's entry into China [FER-I08-A].

In addition to this, Table 8-4 illustrates that SafeMed also shown clear evidence of using GRB as they leveraged their FDA consultant's existing industrial network to create initial social capital with a foreign distributor in North Carolina, U.S.A. Interestingly, both HeartBeat and FemMed used this activity, but did so, somewhat indirectly. For example, the researcher found that HeartBeat used GRB to create social capital with a Hong Kong manufacturer (i.e. a supplier) but as the relation began to evolve, this supplier subsequently became the firm's core customer. Moreover, Table 8-4 also specifies that FemMed initially used GSB to identify US customers, but after some unsuccessful attempts at building buyer social capital, the firm moved towards using GRB as an activity to create social capital with US buyers. This is apparent as FemMed relied on their local BAS's (e.g. Harmony) contacts in the US to identify and collaborate with US sales agents while using an M&A specialist (e.g. TechSale) to refer them to a suitable strategic buyer.

Table 8-4 also indicates that two (FemMed and SafeMed) of the four INVs also engaged in GSB to create buyer social capital. Cross-findings show that these networking activities seem to occur early on within NVI. That is, FemMed initially used GSB to source a strategic buyer (e.g. MediBuy) and US distributor (e.g. MedSale) as they did not have the initial US industrial networks in place. Quotation GSB3 within Table 8-1 is one notable example of GSB as the entrepreneur of FemMed describes the process of how they identified their first US customer. The entrepreneur explains:

> How did we search and select this partner, good question, I think we employed a sales director in the States who really put an advert I think or used his contacts to see if there was any distribution companies who would be interested in selling [FemMed] products. So you really have got to choose someone in the know who has the network and that is what we did [FER-I10-C].

Table 8-4: The Creation of Buyer Social Capital

Inter-organisational tie	Source of tie creation	Tie origin˘	Initial access to information or resources	Future referrals	Network creation activity†
Fertility					
Chinese distributor	Referral	Global	Chinese distributor provided the entrepreneur with foreign market knowledge	No	GRB
EU licensor	Referral	Global	None	No	GRB
UK sales agents	Referral	Local	UK sales agents provided access to an initial UK sales channel	No	LRB
EU distributor	Referral	Global	None	No	GRB
Canadian distributor	Approached	Global	Canadian distributor funded the firm's regulatory approval and provided access to a Canadian sales channel	Yes	GAB
HeartBeat					
Universities	Approached	Global	Universities around the world supported the entrepreneur with R&D and were the firm's major customer	Yes	GAB
HK manufacturer	Referral	Global	Hong Kong manufacturer funded the firms initial production of a prototype	Yes	GRB
FemMed					
Strategic Buyer (1)	Search	Global	None	No	GSB
US distributor	Search	Global	None	No	GSB
US sales agents	Referral	Global	Hired US sales agents to sell product and access to local market knowledge	Yes	GRB
Strategic Buyer (2)	Referral	Global	The strategic buyer entered into discussion with the firm about a potential strategic exit	No	GRB
SafeMed					
US licensor	Search	Global	None	No	GSB
US distributor	Referral	Global	None	No	GRB

˘ The author examines tie origin on whether the connection formed locally or globally. Following Tippmann et al. (2012) the author uses the term "global" loosely to avoid complexity by incorporating various levels of international scope.

† Figure 8-1 illustrates the following network creation activities emerged as second-order themes via data analysis. Thus, "LRB" refers to local referral bridging, "GRB" refers to global referral bridging, "LSB" refers to local search bridging, "GSB" refers to global search bridging, "LAB" refers to local acceptance bridging, while "GAB" refers to global acceptance bridging.

Source: The Author

These data indicate that Fertility hired a US sales director in order to search his local network to identify a suitable foreign customer. Another example of GSB is apparent in SafeMed, who described in the interviews that they concentrated their search on large US based medical technology MNEs. The entrepreneur tells story that he individually "cold called" each of the US medical technology MNEs about the prospect of a potential licensing agreement. This search process then resulted in the firm forming initial ties with one US MNE who owned a subsidiary in Sydney, Australia. However, these initial negotiations were unsuccessful.

GAB was also found to be an important "bridging" activity within two (Fertility and HeartBeat) of the four INVs. In both these cases, potential customers approached these firms as they had a specific interest in their unique technology. For example, at international start-up, HeartBeat's early involvement in a US led R&D consortium led to multiple universities

wanting to purchase their research-based products. Additionally, at the international expansion, a large Canadian distributor approached Fertility who asked and agreed to sell the INV's products.

Finally, Table 8-4 indicates most INVs were unable to use their initial buyer social capital for the purposes of future bridging activities. Fertility, for example, were unable to use their initial buyer social capital with Chinese and European MNEs to make future connections. This is also apparent in FemMed who were unable to form long-term ties with their US distributor, which meant there was no possibility for future bridging activities. This situation also occurred in SafeMed, as the firm were unable to form ties with a US licensor and distributor, which meant there was no prospect of future tie referrals. Interestingly, HeartBeat were the only INV to show clear evidence of bridging their customers' networks. For example, HeartBeat were able to encourage their customers to refer them to new customers, which helped create new buyer social capital. Overall, these findings show that these INVs engaged in multiple and simultaneous "bridging" activities to create buyer social capital.

8.2.4 The Creation of Supplier Social Capital

Table 8-5 reports on how INVs create supplier social capital. Firstly, the cross-case analysis specify that all four of the INVs initial networking activities sought to create supplier social capital. In most cases, these supplier ties were subcontractor manufacturers, but the cross-case analysis does provide evidence of forming ties with R&D partners, who in many respects contribute to the supply of "knowledge" within the overall commercialisation process. The researcher also found that three of the four INVs used multiple networking activities to create supplier social capital, which unfolded both locally and globally. This is apparent from Table 8-5, which reports that all of the INVs initially formed ties with subcontractor manufacturers. For example, Fertility initially formed ties with an English manufacturer who had the production capabilities to produce product quickly in an attempt to generate early sales revenues. Similarly, HeartBeat had also initially formed ties with a local manufacturer, as the entrepreneur had known the owner-manager from previous business ventures. However, as HeartBeat began to expand, they subsequently had to locate an international manufacturer (e.g. EliteTech) who had the manufacturing capabilities to produce Heartbeat's product on a global scale.

By contrast, Table 8-5 shows that FemMed and SafeMed's initial ties with suppliers where more international in scope. That is, FemMed created social capital with a French manufacturer who had the specialist manufacturing capabilities to produce the INV's medical device. Nevertheless, as section 8.4.2 explains in more depth, FemMed encountered quality and timing problems with the French manufacturer. This then encouraged FemMed to create new social capital with a Scottish manufacturer who had superior quality control procedures than the previous manufacturer. Interestingly, Appendix 4 illustrates that SafeMed engaged in a higher intensity of social capital creation with suppliers as they attempted to form multiple ties with R&D consultants, a local university, along with two medium sized US manufacturers. One interpretation of this high networking intensity was that the majority of SafeMed's TMT had industry backgrounds in both finance and real estate, which meant they had to subcontract the majority of their R&D and production activities.

Table 8-5: The Creation of Supplier Social Capital

Inter-organisational tie	Source of tie creation	Origin of connectionˇ	Initial access to information or resources	Future referrals	Network creation activity†
Fertility					
English manufacturer	Referral	Local	English manufacturer had the capability to quickly produce product	No	LRB
HeartBeat					
Local manufacturer	Search	Local	Local manufacturer supported the entrepreneur with initial production of his firm's medical device	No	LSB
HK manufacturer	Referral	Global	Hong Kong manufacturer funded the firms initial production of a prototype	Yes	GRB
FemMed					
French Manufacturer	Search	Global	French manufacturer had specialist capabilities to produce the firm's medical device	No	GSB
Scottish manufacturer	Search	Local	Scottish manufacturer provided superior quality control than existing suppliers	No	LSB
SafeMed					
R&D consultants	Search	Global	None	No	GSB
Local university	Search	Local	Local university conducted FDA approved clinical trials	No	LSB
NC manufacturer	Referral	Global	North Carolina manufacturer initially agreed to produce firm's product, but quickly ceased relationship	No	GRB
NY manufacturer	Referral	Global	None	No	GRB

ˇ The author examines tie origin on whether the connection formed locally or globally. Following Tippmann et al (2012) the author uses the term "global" loosely to avoid complexity by incorporating various levels of international scope.

† Figure 8-1 illustrates the following network creation activities emerged as second-order themes via data analysis. Thus, "LRB" refers to local referral bridging, "GRB" refers to global referral bridging, "LSB" refers to local search bridging, "GSB" refers to global search bridging, "LAB" refers to local acceptance bridging, while "GAB" refers to global acceptance bridging.

Source: The Author

Table 8-5 and Appendix 5A indicate that three of the four INVs also drew on a combination of referral and search practices at the local and global level in order to create supplier social

capital. Table 8-5 illuminates that Fertility were limited in their networking when forming supplier ties, as they were the only INV to use LRB to create supplier social capital. In this event, Fertility's mentor Angus referred the firm to an English manufacturer who initially produced the firm's product. However, in most circumstances, referral activities were global, as this was evident in HeartBeat and SafeMed who both relied on key contacts to introduce them to suitable strategic partners. For example, HeartBeat's entrepreneur used his friendship with a US cardiologist to link-in with a Hong Kong manufacturer who had significant production and distribution capabilities. Additionally, SafeMed also relied on their FDA consultant to introduce them to a North Carolina and New York manufacturer.

Table 8-5 also indicates that three (HeartBeat, FemMed, SafeMed) of the four INVs engaged in both LSB and GSB. For example, HeartBeat's entrepreneur describes that he initially searched for a local manufacturer, as he wanted to collaborate with a subcontractor that "he could trust and not have to manage" who was locally accessible during the commercialisation phase. FemMed's reasoning to form a subsequent strategic alliance with a Scottish manufacturer is also similar, as after collaboration problems with their French manufacturer (see section 8.4) they discovered the benefits of local collaboration. However, quotation LSB4 within Table 8-1 provides evidence of the challenges in using LSB to create social capital with suitable suppliers. FemMed's entrepreneur tells a story that they commenced their supplier search in the UK, but once they continued their "local search" in the US having established a sales subsidiary, they ironically found a Scottish manufacturer:

> It was at technology fairs that we identified key subcontractors. And in actual fact, it just so happens that our main subcontractor are local, and we weren't aware of them before we went to the [US] technology fair. You know, it is quite a complex networking activity in the UK, so consultant word of mouth and technology fairs were the main ones [FEM-I09-B1].

SafeMed also shown evidence of LSB as they searched for a local university in Queensland, Australia who had the capabilities to conduct FDA approved clinical trials. Nonetheless, Table 8-5 specifies that both FemMed and SafeMed also engaged in GSB to create supplier social capital. For example, it is evident that FemMed used GSB to form initial ties with a French manufacturer, prior to forming ties with the above local Scottish manufacturer. The above display also indicates that SafeMed used GSB to source R&D consultants in both China and the USA, which sections 8.4 and 8.5 describe as major inhibitor in the INVs long-term development. Finally, Table 8-5 indicates none of the INVs used GAB as mechanism to create supplier social capital, while only one supplier – HeartBeat's Hong Kong

manufacturer – were able to use this social capital to source future connections. Overall, these findings show that most INVs engaged in local and global bridging activities to create supplier social capital.

8.3 RQ2: How do INVs extend their existing social capital?

This section reports the cross-case findings on how INVs extend their existing social capital. In accordance with Miles and Huberman (1994) and Saldaña (2003), the researcher uses longitudinal data displays to examine how INVs extend their existing social capital. It is important to emphasise the following data displays are aggregates of Appendix 6, which present a more granular cross-case data analysis on the various sources that extend INV social capital. Figure 6-5 illustrates that three second-order "bonding" themes emerged during this cross-case analysis, which aggregate several first-order concepts. These second-order themes consist of (1) dependency bonding (DB), (2) impassive bonding (IBG), and (3) affinity bonding (AB). Interestingly, this research found that "bonding" is more than just a general trust building process. That is, this research found evidence there are different types of "bonding" due to the nature and quality of the relationship. Table 8-6 thus presents representative data of each of these second-order themes. Figure 8-2 also summarises the cross-case findings on how INVs extend their existing social capital. Therefore, this section will discuss each of these networking activities with respect to the extension of investor, mentor, buyer, and supplier social capital.

8.3.1 The Extension of Investor and Mentor Social Capital

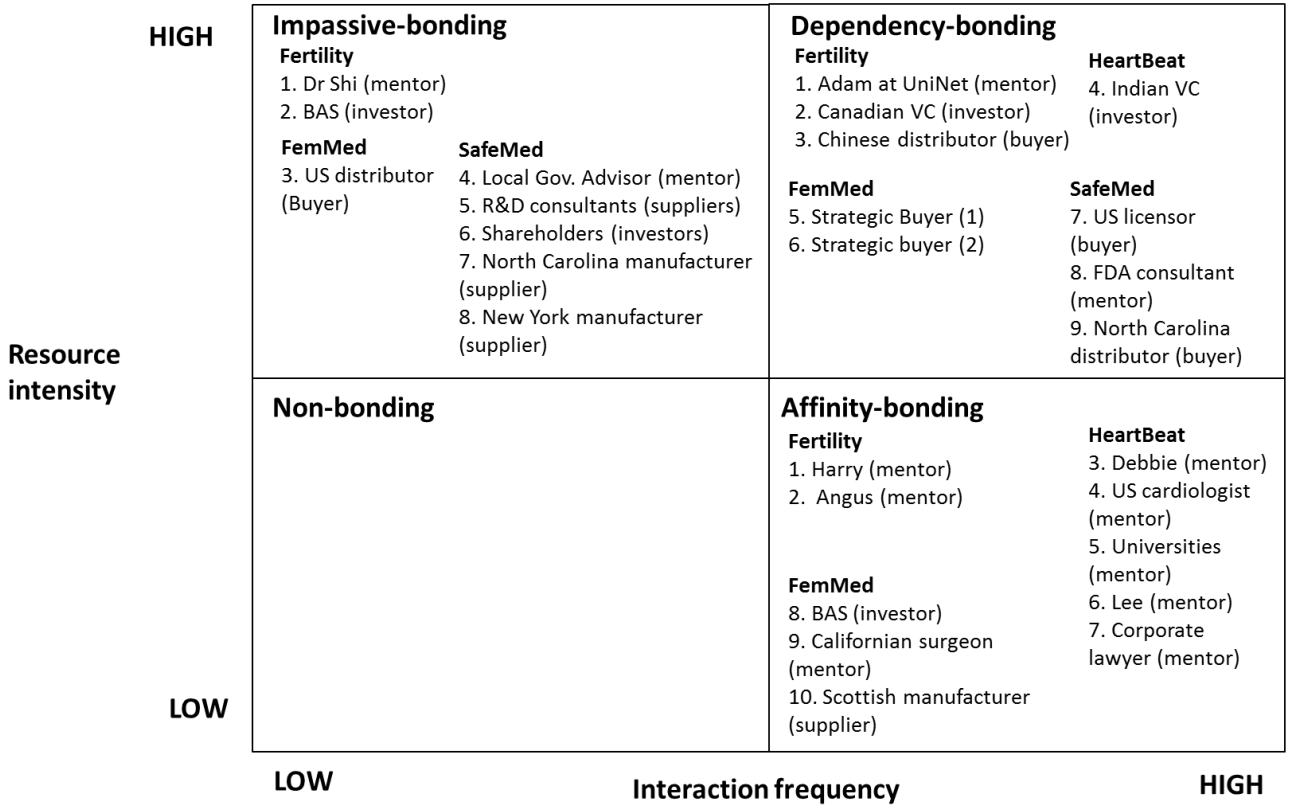
Table 8-7 reports on how INVs extend their investor and mentor social capital. To begin with, Figure 8-2 illuminates an important finding that the INVs initial bonding activities predominately focussed on building relations with investors and mentors. Table 8-7 also provides evidence that all of the INVs attempted to extend their investment in exiting stocks of social capital with at least one investor and one mentor and in some situations the intensity and frequency of their networking was much greater than this. For example, after Fertility attempted to create social capital with eight investors, they were only able to extend investment with two potential investors. Whereas, the other INVs networking activities was less diverse, but in some cases more intensive, as the firms invested more resource in terms of time, money and energy into building individual inter-organisational network relationships.

Table 8-6: Representative Data supporting Second-Order "Bonding" Themes

Second-order theme	Representative data
Dependency bonding	Fertility: DB3 Since [Zhan] left, I would say the relationship [Chinese distributor] has definitely got better. As you know we are continuing to make trips, they made a trip out to Germany to meet us, so we are definitely trying to grow this relationship, and I have sought validation of them constantly. So when I talk about us being valid, I try to validate them. When I met the Chinese ambassador, I endorse them. I guess they are taking reference – they are the references [FER-I11-A].
	HeartBeat: DB4 This [due diligence] went on for about six months, and the financial crisis just started to impact. It wasted a lot of our resources as they went into negotiation and agreements. So that cost us a lot of money in terms of having to pay lawyers and accountants. Then their share price collapsed on the Indian stock market, so at the last minute they withdrew from the deal, which left us in a very difficult situation, in that we'd been trying to close on this deal, and hadn't been able to focus on our other business [HEA-I09-C].
	FemMed:DB5 We had a lot of interest from a big multinational and what big companies do is they require a certain amount of due diligence to determine whether or not the company is something they want to acquire. The amount of resource that is diverted into that instead of the day-to-day running was absolutely immense and to get nothing at the end of it, I think they probably delayed us a good 3 or 4 months while we devoted resource to getting them their due diligence [C-PRB-05].
	SafeMed: DB8 I met them at the end of the trip [after the unsuccessful license deal] and that was kind off the beginning of the relationship. He said forget [MedUSA], forget the big guys, they are never going to get it out in the marketplace for you, stick with me because I have a team of independent sales guys that can actually make this happen for you, because the big guys are not going to help you. So I came back from that trip thinking he is probably on the right track and we developed it from there [SAF-I10-B]
Impassive bonding	Fertility: IB1 [Zhan]… he likes to go to work at 9:00 and get done at 5:00 and that's it. He is an academic scientist and so getting him to spread himself…he won't do it, and then he's like, oh, I'm going to take a four-week vacation in July [2009] and I'm thinking...[FER-I09-B]
	FemMed: IB3 The other thing that delayed us quite a lot was distributors. We had a distributor in the US, we tried to go down that route and it just simply didn't work out because the problem with distributors is if they don't want to sell your product they won't sell it and we lost a good 6 to 8 months on this. The distributor was very keen on our product, we signed a deal and shipped products to them, and just absolutely nothing came of it. Either they didn't want to sell it, or they didn't have the expertise or they were promoting their own product so that was a big lesson learned [FEM-I08-B].
	SafeMed: IB8 We basically had our own views about this guy [North Carolina manufacturer], he never gave us any ideas about how he was going to make it, he had no credibility really, he made all his previous stuff in China, this was the first time he was going to make it in America. We then kept asking how are you going to make it, show us some specs, show us how you are going to do it. So we were quite happy, probably by November [2009], that listen it ain't going to happen with the [North Carolina] manufacturer [SAF-I10-B].
Affinity bonding	Fertility: AB1 Guys like that give you support every week. You can talk to them and they're just happy to hear from you and it's that encouragement that, you know, and you can bounce things off. So, it's having that involvement. I'd say he's definitely one [FER-I09-B]
	HeartBeat: AB4 We had a personal friendship and he [Dr Arthur] and I had a meeting of the minds on doing this iPhone sort of stuff, but we never had the resources to do this all. So he said I will go and get them. So he built a prototype and then we went and got some money to fund what we needed and the small things we needed to do. So he is a friend and one I can trust, he does the right thing by me, so that is how it worked out [HEA-I10-B2].
	FemMed: AB8 So many times over the last 8-9 years any of us could bailed out, because sales weren't picking up, […] but it took an investment and a decision in 2007 to go for it in the States to achieve what we were looking for. So there was commitment on both sides to making [FemMed] a success.

Source: The Author

Figure 8-2: Network Extension Activities: Summary of Findings



Source: The Author

FemMed is one notable example as section 8.2.1 describes that the firm decided to build relations with one investor (i.e. Harmony a local BAS) despite having the early choice of forming multiple investor ties. The choice to extend social capital with only one investor was also apparent in HeartBeat and SafeMed, as the former extended their social capital with an Indian VC syndicate, while the latter attempted to extend their social capital with a network of shareholders. Interestingly, Table 8-7 and Appendix 6 also show that each INV drew on various "relational sources" to extend their investor social capital. In line with Maurer and Ebers (2006), Table 8-7 analyses these relational sources through the (1) "resource intensity" required to build each network relationship; the (2) "frequency" by which the INVs interacted with each tie; and the initial (3) "source of trust" on which each relationship developed. Table 8-7 also specifies that over time, bonding activities with investors led to either an overall increase or decrease in the value of this social capital, which section 8.5 elaborates on.

Interestingly, Table 8-7 provides evidence that the INVs used different types of bonding to extend their investor social capital. For example, during the GFC of 2008-2009, there is evidence that Fertility and HeartBeat both engaged in DB to secure venture capital. In Fertility's case, after using GRB to create investor social capital with a Canadian VC syndicate, the entrepreneur agreed to engage in the VC's due diligence process. During this time, Fertility's entrepreneur describes that the firm allocated all of its time and resource to the due diligence process. Moreover, the entrepreneur describes they interacted on a weekly to daily basis with the VC lawyers in an attempt to satisfy their due diligence procedures, which ultimately was unsuccessful. Consequently, this activity indicates since resource intensity and interaction frequency were both high, a likely interpretation is that dependency was the underlying source of trust as the firm attempted to extend this social capital.

Similarly, once HeartBeat used GAB to create social capital with an Indian VC syndicate, the entrepreneur engaged in their due diligence process. During this event, the entrepreneur describes that this due diligence was a resource intensive and interactive process, which lasted for six months, but subsequently was unsuccessful. Quotation DB4 within Table 8-6, illustrates the nature of this DB when HeartBeat's entrepreneur describes his experience in attempting to collaborate with the Indian VC:

> This [due diligence] went on for about six months, and the financial crisis just started to impact. It wasted a lot of our resources as they went into negotiation and agreements. So that cost us a lot of money in terms of having to pay lawyers and accountants. Then their share price collapsed on the Indian stock market, so at the last minute they withdrew from the deal, which left us in a very difficult situation, in that we'd been trying to close on this deal, and hadn't been able to focus on our other business [HEA-I09-C].

A likely interpretation of this analysis is that DB led to a decrease in this investor social capital. Consequently, section 8.5 examines these practices in more depth with respect to the influence of DB on NVI. However, Table 8-7 also provides evidence that both SafeMed and Fertility engaged in IBG with their existing investors. For example, following SafeMed's IPO, they had entered into a complex shareholder network, but had raised less financial capital than what they initially anticipated. Consequently, there is strong evidence from the narratives, that over time, the firm became increasingly "impassive" with their shareholders. That is, SafeMed's entrepreneur describes that it cost the firm $500,000 per annum to list on the ASX, but since they did not generate revenue, this increasingly became a significant cost to the firm. Additional primary and secondary data also indicates that SafeMed attempted to raise three "shareholder purchase plans" over a two-year period but these attempts were unsuccessful. When the researcher asked the entrepreneur, why these attempts were unsuccessful, he explained that they had scant resource to personally interact or convince shareholders of their growth potential. It would appear a likely interpretation of this gradual decrease in social capital, was the firm were becoming increasingly "impassive" in bonding with their shareholders.

Indeed, this IBG was also apparent in Fertility's relation with their local BAS. To begin with, Fertility's entrepreneur describes they used LRB to create social capital with a BAS, but when they encountered the financial crisis, they became dependent on their new cash injections into business. However, despite allocating a large amount of resource in terms of equity share to extend this social capital, the entrepreneur describes they "rarely" interacted with the BAS. Incidentally, in the later interviews, the entrepreneur did not discuss the BAS involvement, and when probed, mentioned that he had "other priorities" such as building relationships with foreign customers. There are potential conflicting interpretations here, as these events could suggest there were internal conflicts between Fertility and the BAS, however, since the local BAS were unavailable for interview, the researcher assumes this indicates a degree of IBG as this network relationship evolved over time.

Table 8-7: The Extension of Investor and Mentor Social Capital

	Before the Event¥	During the Event				After the Event
	Source of tie creation	Resource intensity^	Interaction frequencyˇ	Source of trust	Network extension activity†	Change in social capital
Investors						
Fertility – Canadian VC	Global referral bridging	High	High	Entrepreneur was dependent on VC investment	DB	Decrease
Fertility – BAS	Local referral bridging	Low	High	Entrepreneur was dependent on business angel investment	AB	Increase
HeartBeat – Indian VC	Global acceptance bridging	High	High	Entrepreneur was dependent on VC investment	DB	Decrease
FemMed – BAS	Local search bridging	High	Low	Firm had trust investor would invest	IB	Decrease
SafeMed - Shareholders	Global search bridging	High	Low	Firm was dependent on shareholder's investment	IB	Decrease
Mentors						
Fertility – Dr Shi	Local referral bridging	High	Low	Entrepreneur had trust in actors competence	IBG	Decrease
Fertility – Adam at UniNet	Local referral bridging	High	High	Entrepreneur was dependent on the UniNet programme for funding	DB	Decrease
Fertility – Harry	Local referral bridging	Low	High	Entrepreneur was comfortable showing his vulnerabilities	AB	Increase
Fertility – Angus	Local referral bridging	Low	High	Entrepreneur was comfortable showing his vulnerabilities	AB	Increase
HeartBeat – Debbie	Local referral bridging	Low	High	Entrepreneur was comfortable showing his vulnerabilities	AB	Increase
HeartBeat – US cardiologist	Global acceptance bridging	Low	High	Entrepreneur had long-term friendship with actor	AB	Increase
HeartBeat – Lee (VP of EliteTech)	Global referral bridging	Low	High	Entrepreneur had long-term friendship with Lee while working in China	AB	Increase
HeartBeat – US corporate lawyer	Global referral bridging	Low	High	Entrepreneur had full trust in lawyers capabilities	AB	Increase
FemMed – Californian surgeon	Global acceptance bridging	Low	High	Firm was likely to show their vulnerabilities to actor	AB	Increase
SafeMed – Local Gov. Advisor	Local search bridging	High	Low	Firm had no real interest in government despite their interaction	IBG	Decrease
SafeMed – FDA consultant	Global search bridging	Moderate	High	Firm believed in actors guidance	DB	Decrease

¥ In 1 relation (see *), tie creation took place during the event. However, for analytical purposes all tie creation is listed as "before the event" to fully examine the extension of social capital during each event.

^ "Low" refers to commitment of few financial and human resources, i.e. less than 5% of resource base. "Moderate" refers to reasonable commitment of resources, i.e. around 25% of resource base. "High" refers to significant commitment of resources, i.e. more than 50% of resource base.

ˇ "Low" refers to an irregular amount of personal interaction, i.e. less than once a month. "Moderate" refers to a reasonable amount of personal interaction, i.e. twice a month. "High" refers to a regular amount of personal interaction, i.e. weekly or even daily interaction.

† Figure 8-2 illustrates the following network extension activities that emerged as second-order themes via data analysis. Thus, "DB" refers to dependency bonding, "IB" refers to impassive bonding, and "AB" refers to affinity bonding.

Source: The Author

By contrast, Table 8-7 provides evidence that FemMed also decided to extend their social capital investment with a local BAS (e.g. Harmony), but used AB as a mechanism to strengthen this tie over time. Drawing on cognitive sources of social capital, the researcher

uses the term "affinity" as there was strong evidence that some actors instantly bond through an intellectual, cultural, or empathic connection. Incidentally, there is strong evidence of FemMed's AB with Harmony as both actors struck an instant connection over the inventor's altruistic reasons for creating a new technology. Indeed, the depth interviews also specify that FemMed decided to collaborate with Harmony as they could commit a lower-equity share in return for a smaller cash investment, but with the benefit of gaining frequent local access to support and guidance. When the researcher asked the entrepreneur how they bonded, she responded the "angels had total belief in the management team and without this trust, the relationship would not have never been successful" [M-I11-B3]. Quotation AB8 within Table 8-6, also illustrates the nature of AB as FemMed's entrepreneur reflects on this bonding experience:

> So many times over the last 8-9 years any of us could bailed out, because sales weren't picking up, […] but it took an investment and a decision in 2007 to go for it in the States to achieve what we were looking for. So there was commitment on both sides to making [FemMed] a success [FEM-I11-B3].

A likely interpretation of this analysis is these data show clear signs of AB as the BAS continued "belief" and "shared vision" were evident cognitive sources, which helped extend this social capital. Interestingly, Table 8-7 finds that AB was most common in extending mentor social capital. That is, in three (Fertility, HeartBeat and FemMed) of the four INVs, there was strong evidence of AB with mentors. For example, section 8.2.2 describes after Fertility's entrepreneur used LRB to create social capital with two mentors (e.g. Harry and Angus), he quickly built an intellectual connection with them due to their involvement in the life sciences industry. Thus, quotation AB1 within Table 8-6 shows signs of Fertility's affinity bonding with Harry a local mentor and life science entrepreneur:

> Guys like that give you support every week. You can talk to them and they're just happy to hear from you and it's that encouragement that, you know, and you can bounce things off. So, it's having that involvement. I'd say he's [Harry] definitely one [FER-I09-B]

Since Fertility regularly confided with these mentors, this indicates the entrepreneur was comfortable in showing his vulnerabilities, which is a clear source of trust that helped extend this social capital. Thus, a likely interpretation of this analysis is one of AB as the entrepreneur frequently interacted with these mentors but allocated a low level of financial resource in order to extend this social capital. Similarly, HeartBeat shows clear signs of using AB with mentors, with specific reference to the entrepreneur's long-term friendship with Dr

Arthur – a US cardiologist – as he became a KOL for the business. In this case, the narratives provide strong evidence that both actors bonded through an immediate intellectual connection, which formed the foundations of a long-term relationship. Quotation AB4 within Table 8-6 exemplifies HeartBeat's bonding activity:

> We had a personal friendship and he [Dr Arthur] and I had a meeting of the minds on doing this iPhone sort of stuff, but we never had the resources to do this all. So he said I will go and get them. So he built a prototype and then we went and got some money to fund what we needed and the small things we needed to do. So he is a friend and one I can trust, he does the right thing by me, so that is how it worked out [HEA-I10-B2].

Moreover, Table 8-7 indicates this "meeting of minds" surrounding an emerging technology is one evident cognitive source, which helped increase the value of this social capital. Moreover, the entrepreneur's "friendship" and "trust [that], he does the right thing by me" are evident relational sources, which helped increase this social capital. Thus, a possible interpretation of this analysis is this low level of resource intensity and high frequency of interaction indicates that HeartBeat used AB as a lubricant to extend this mentor social capital.

Finally, despite this repeated practice of AB, in some cases there were signs of DB, where firms relied on their mentors for global referrals. For example, Table 8-7 specifies that Fertility relied on Adam at UniNet to make initial introductions to foreign investors and buyers, which required a large amount of resource and personal interaction. However, there is evidence that these initial ties with a foreign investor (i.e. Canadian VC) and buyer (i.e. EU licensor) began to severe very quickly, which indicates that Fertility's DB was likely to have decreased the value of this mentor social capital. Similarly, this situation was also apparent in SafeMed as Table 8-7 specifies the firm relied on an FDA consultant to connect with a potential US manufacturer and distributor, which as section 8.4 describes was unsuccessful. Thus, this implicit use of DB appears to have decreased the value of this social capital. These findings then indicate that all of the INVs used multiple networking activities in an attempt to extend their investor and mentor social capital.

8.3.2 The Extension of Buyer and Supplier Social Capital

Table 8-8 reports on how INVs extend their investment in buyer and supplier social capital. Figure 8-2 illuminates that the INVs use different types of bonding to extend their buyer and

supplier social capital. To begin with, Table 8-8 shows that each INV attempted to use at least one type of bonding and in some cases a combination of bonding activities (e.g. FemMed and SafeMed) to extend their buyer social capital. For example, after SafeMed used GSB to form ties with a US licensor, they attempted to extend their initial social capital with this MNE. However, as the narratives describe, the firm allocated a large proportion of its human and financial resource to secure a foreign license agreement. This involved flying to Sydney on a regular basis to negotiate with their Australian subsidiary, while making three trips from Australia to the US in an attempt to sign an agreement. However, despite these attempts to extend this initial social capital the firms did not sign a license agreement.

This indicates since resource intensity and interaction frequency were both high, a likely interpretation is that dependency was the underlying source of trust that motivated the decision to extend this buyer social capital. However, given SafeMed were unable to strengthen this tie, it is evident this implicit use of DB decreased the value of this buyer social capital. Table 8-8 also reports that SafeMed subsequently used DB to extend their social capital with a North Carolina distributor, which was also unsuccessful. Given that these dependencies characterise SafeMed's overall bonding with buyers, a likely interpretation is the firm shown an overall weaknesses in bonding with potential customers. Similarly, Table 8-8 also reports that the researcher found Fertility used DB as they attempted to extend their social capital with a large Chinese distributor. In this case, after using GRB to form ties, Fertility's entrepreneur describes they entered a "trust building phase" which involved making regular trips to China to strengthen this relationship.

Table 8-8: The Extension of Buyer and Supplier Social Capital

	Before the Event¥	During the Event				After the Event
	Source of tie creation	Resource intensity^	Interaction frequencyˇ	Source of trust	Network extension activity†	Change in social capital
Buyers						
Fertility – Chinese distributor	Global referral bridging	High	High	Entrepreneur was dependent on actors business	DB	Increase
HeartBeat – Universities	Global acceptance bridging	Low	High	Entrepreneur was willing to show his vulnerabilities	AB	Increase
FemMed – US distributor	Global search bridging	High	Low	Firm had trust in the actors reliability	IB	Decrease
FemMed – Strategic buyer (1)	Global search bridging	High	High	Firm was reliant on the actor to agree to a trade sale	DB	Decrease
FemMed – Strategic buyer (2)	Global referral bridging	High	High	Firm had trust in actors competence but was reliant in trade sale	DB	Increase
SafeMed – US licensor	Global search bridging	High	High	Firm was dependent on signing licensing deal	DB	Decrease
SafeMed – NC distributor	Global referral bridging	High	High	Firm had trust in actors competence	DB	Decrease
Suppliers						
FemMed – Scottish manufacturer	Local search bridging	Low	High	Firm had trust in actors competence and reliability	AB	Increase
SafeMed – R&D consultants	Global search bridging	High	Low	Firm had trust in actors competence	IB	Decrease
SafeMed – NC manufacturer	Global referral bridging	High	Low	Firm had initial trust in actors competence	IB	Decrease
SafeMed-NY manufacturer	Global referral bridging	High	Low	Firm had initial trust in actors competence	IB	Decrease

¥ In 4 relations (see *), tie creation took place during the event. However, for analytical purposes all tie creation is listed as "before the event" to fully examine the extension of social capital during each event.

^ "Low" refers to commitment of few financial and human resources, i.e. less than 5% of resource base. "Moderate" refers to reasonable commitment of resources, i.e. around 25% of resource base. "High" refers to significant commitment of resources, i.e. more than 50% of resource base.

ˇ "Low" refers to an irregular amount of personal interaction, i.e. less than once a month. "Moderate" refers to a reasonable amount of personal interaction, i.e. twice a month. "High" refers to a regular amount of personal interaction, i.e. weekly or even daily interaction.

† Figure 8-2 illustrates the following network extension activities that emerged as second-order themes via data analysis. Thus, "DB" refers to dependency bonding, "IB" refers to impassive bonding, and "AB" refers to affinity bonding.

Source: The Author

However, when Fertility's co-founder Dr Shi – a Chinese national – left the company, the entrepreneur describes the Chinese MNE began to lose trust. Quotation DB3 within Table 8-6 therefore illustrates how Fertility attempted to bond with the Chinese MNE after the co-founder left the company:

> Since [Zhan] left, I would say the relationship [Chinese distributor] has definitely got better. As you know we are continuing to make trips, they made a trip out to Germany to meet us, so we are definitely trying to grow this relationship, and I have sought validation of them constantly. So when I talk about us being valid, I try to validate them. When I met the Chinese ambassador, I endorse them. I guess they are taking reference – they are the references [FER-I11-A].

One interpretation is this regular interaction and high resource commitment indicates that the INV used DB to extend this social capital. Given this firm signed a multi-million pound distribution agreement, it is evident this bonding activity paid dividends due to the increase in this social capital value. Nevertheless, there are potential conflicting interpretations here as Table 8-7 reports the majority of DB across firms decreased the value of investor and mentor social capital. Table 8-8 also reports that FemMed attempted to strengthen ties with a US MNE who expressed an interest in acquiring the firm. However, quotation DB5 within Table 8-6 describes that FemMed's attempt at bonding with this strategic buyer was fraught with difficulty:

> We had a lot of interest from a big multinational and what big companies do is they require a certain amount of due diligence to determine whether or not the company is something they want to acquire. The amount of resource that is diverted into that instead of the day-to-day running was absolutely immense and to get nothing at the end of it, I think they probably delayed us a good 3 or 4 months while we devoted resource to getting them their due diligence [FER-I08-B].

These data emphasise this due diligence process involved elements of DB, as this frequent interaction with the MNE was a resource intensive exercise. Given FemMed's attempt to extend this social capital was unsuccessful, it is evident this DB decreased the value of this social capital. However, Table 8-8 indicates that FemMed engaged in DB to extend social capital with another strategic buyer called StarBuy, which eventually was successful as they agreed a trade sale. Therefore, this analysis indicates that DB can also increase the value of social capital. Consequently, a likely interpretation of these conflicting results is that DB appears to consist of stronger and weaker practices, which has a bearing on whether this activity increases or decreases the value of social capital. Therefore, moving back to Fertility's case, since the Chinese MNE were unavailable for the interview, the researcher assumes the subsequent signing of a distribution agreement indicates that this DB paid dividends as there was in an increase in the value of this buyer social capital.

Table 8-8 also reports that INVs engaged in IBG as they attempted to extend buyer and supplier social capital. However, it is important to emphasise that there is more evidence of IBG occurring with suppliers than customers, which is logical given the financial benefits and priority to build customer relations. Nevertheless, Quotation IB3 within Table 8-6 show that IBG can occur with customers, which is evident from FemMed's attempt to build ties with MedSale a US distributor:

> The other thing that delayed us quite a lot was distributors. We had a distributor in the US, we tried to go down that route and it just simply didn't work out because the problem with distributors is if they don't want to sell your product they won't sell it and we lost a good 6 to 8 months on this. The distributor was very keen on our product, we signed a deal and shipped products to them, and just absolutely nothing came of it. Either they didn't want to sell it, or they didn't have the expertise or they were promoting their own product so that was a big lesson learned [FEM-I08-B].

In the subsequent interview, the researcher asked the entrepreneur how often FemMed interacted with MedSale, which led to the respondent saying "not enough" which confirms after they signed this distribution agreement, they rarely interacted with this MNE. FemMed's "disappointment" in not achieving early sales, also indicates a growing sense of impassiveness for this customer, as despite the commitment of resource to this tie, they were inefficient in the extension of this social capital. Thus, a likely interpretation of this analysis is this IBG decreased the value of this buyer social capital. Additionally, Table 8-8 specifies that SafeMed implicitly engaged in IBG in various attempts to extend their supplier social capital. For instance, after using GSB to create social capital with American and Chinese R&D consultants, the firm began to encounter significant quality problems with these suppliers. Section 8.5 elaborates on these problems. There is also strong evidence in the narratives, that SafeMed were impassive about their new ties with US manufacturers. For example, in the initial interview, the entrepreneur describes the benefits of forming ties with a North Carolina manufacturer and speaks of them in a positive light. However, in the subsequent interview, quotation IB6 within Table 8-6 illustrates that IBG was likely to have taken place during their attempt to extend this supplier social capital:

> We basically had our own views about this guy [North Carolina manufacturer], he never gave us any ideas about how he was going to make it, he had no credibility really, he made all his previous stuff in China, this was the first time he was going to make it in America. We then kept asking how are you going to make it, show us some specs, show us how you are going to do it. So we were quite happy, probably by November [2009], that listen it ain't going to happen with the [North Carolina] manufacturer [SAF-I10-B].

There is also strong evidence from the narratives that these problems meant the firm became increasingly impassive about this tie. That is, SafeMed's entrepreneur describes there was little interaction with the North Carolina manufacturer, despite the initial resource it took to create this social capital. A likely interpretation of this analysis is this IBG led to an overall decrease SafeMed's supplier social capital. Consequently, section 8.5 examines these practices in more depth with respect to the influence of IBG on NVI. Finally, Table 8-8

shows there were rare occurrences that INVs use AB to extend buyer or supplier social capital. However, this research did find that HeartBeat were the only firm to use AB to build an intellectual connection with universities, who subsequently became a core customer. FemMed also were the only firm to use AB to build a personal friendship with their local manufacturer. Nevertheless, it is apparent that AB seems to occur with actors when an inter-personal connection emerges over time. Overall, these cross-case findings show that these INVs engaged in a combination of bonding activities as they attempted to extend their buyer and supplier social capital.

8.4 RQ3: How do INVs modify their social capital?

This section reports the cross-case findings on how INVs modify their existing social capital. This section replicates the structure of section 8.3 by using longitudinal data displays (Miles and Huberman, 1994; Saldaña, 2003) to examine how INVs modify their social capital. Figure 6-5 illustrates that three second-order "modifying" themes emerged during this cross-case analysis, which aggregate several first-order concepts. These second-order themes consist of (1) eliminating ties (ETS), (2) prioritising ties (PTS), and (3) reconfiguring ties (RTS). Drawing on Helfat and Peteraf's (2003) various forms of resource modification, the researcher found strong evidence that the INVs either "retrench" (i.e. phase out) or "redeploy" (i.e. use for another purpose) their social capital. Figure 8-3 also reports the way in which INVs modify their social capital was largely dependent on the strength and nature of the tie. Table 8-9 thus presents representative data of each of these second-order themes.

An interesting observation when comparing Figures 8-1, 8-2 and 8.3 is there were less instances of how INVs modify their social capital in contrast to how they create or extend this asset. A likely interpretation of this finding is since most INVs are young in age and small in size, it is appears there is an initial need to create and extend their social capital, opposed to modifying this asset. However, Figure 8-3 does report that way INVs modify their social capital differs significantly across cases. For example, Figure 8-3 indicates Fertility most frequently modified their social capital in comparison to FemMed and SafeMed who only modified this asset on a few occasions. There are potential conflicting interpretations here, as one could argue Fertility's regular modification of social capital shows a dynamic capability in networking, while another view is the performance of these networking activities show less experience in the efficient creation or extension of social

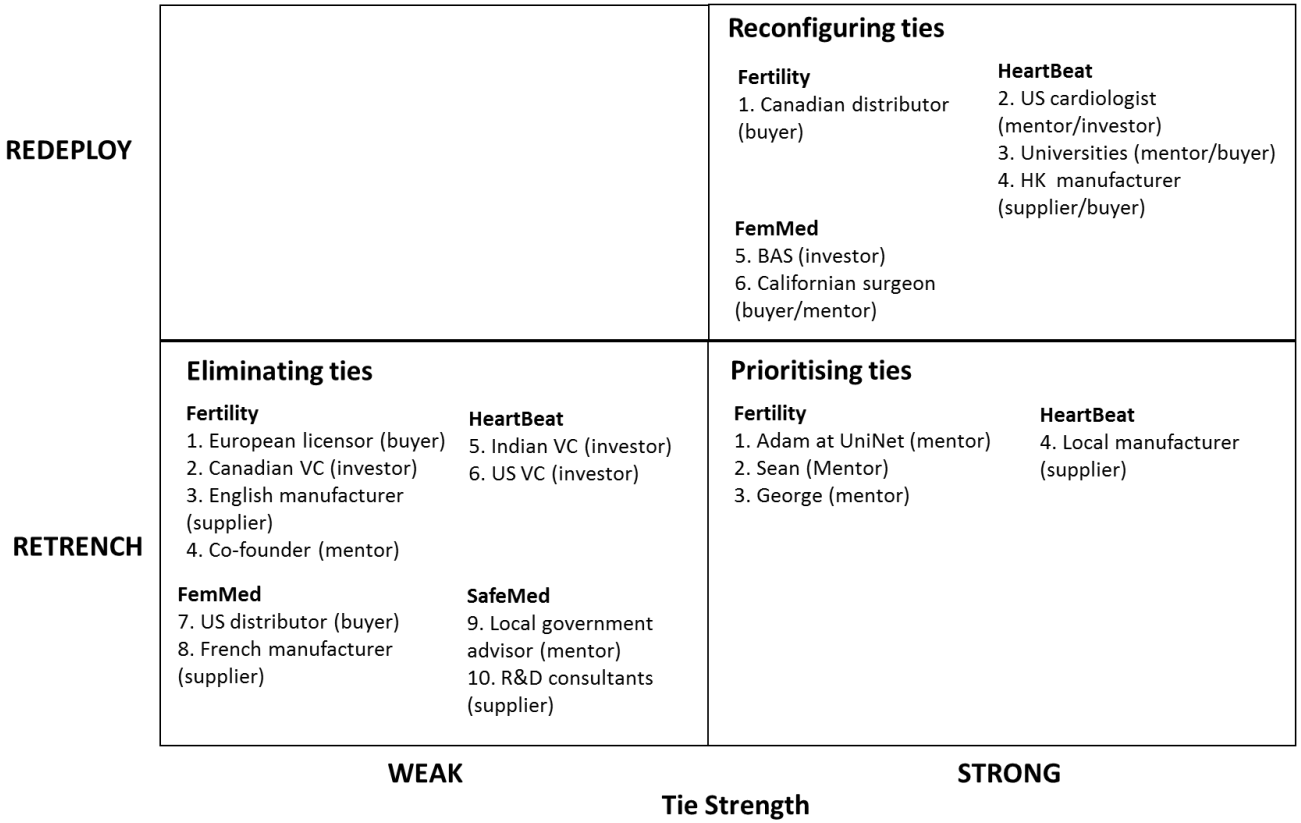
capital. Therefore, the following sections will now examine these networking activities in depth.

Table 8-9: Representative Data supporting Second-Order "Modifying" Themes

Second-order themes	Representative data
Eliminating ties	Fertility: ETS4 I think the thing with [Zhan], which was the most disappointment, was the lack of transparency in what he was doing. If he was scared, he should have been a man and said I'm scared. But he didn't and he just didn't produce. So he left us exposed, incredibly exposed and that was quite cowardly, so we took a huge hit for that [FER-I11-A].
	HeartBeat: ETS5 & ETS6 So many friends of mine, you know, they're trying to get a company off the ground, and they're just spending so much time talking to potential investors and 99% of them aren't even in a position to invest even if they wanted to. So I think we learned that we wasted six months of our lives, that was a very negative kind of thing. So after that [elimination of VC] I decided we would just focus on doing what we could with our own resources. First of all, you have to survive. There's no point… if you can't survive…if you're not successful in raising capital and you're burning money, then you're stuck between a rock in a hard place. You'll just collapse, right? [HEA-I09-C].
	SafeMed: ETS10 We have spent five years doing R&D, that's another story. You can help me write my book about [SafeMed]. We have had several partners on the R&D side. We went through numerous consultants, who helped us then hindered us. So we changed design consultants about three times [SAF-I10-B].
Prioritising ties	Fertility: PTS1, PTS2 & PTS3 Get rid of those ones [Adam, George, Sean]. They aren't important anymore. Maybe at the time they were instrumental at getting me through those small little stages. But now I've got [Bob], and [Stephanie] here. So [Bob] is our new consultant who does sales, and [Stephanie] is our product marketing director/consultant. Those ones [Adam, George, Sean] are now outside my network but [Harry] he is still core [FER-I11-A].
	HeartBeat: PTS4 So we have finished up with our local manufacturer. The problem is we had to change due to the regulatory, as we now have to all the CE mark testing and everything. To sell into Europe we have to have a certified manufacturer who meets all the quality standards. So we now have our [Hong Kong manufacturer] up and going. So they will be able to scale up our manufacturing and they can produce more product in a day than our [local] manufacturer could produce in a month [HEA-I10-A].
Reconfiguring ties	Fertility: RTS1 Just off the phone with Canada today and their order is three times what I expected, and they have just doubled again, so that is 6 times what I expected as initial order. But I don't have any money, so we have had to say look, we don't have any money to do this, and they said look, what do we have to give you to get it done. So we brought somebody in and they said you can pay them to finish the registration and we will discount it against the order when you are placing it. So definitely getting more creative with how we finance ourselves in this time, where traditionally banks were there. They are not there for you, they don't give a shit, I'm not a bank fan [FER-I11-A].
	HeartBeat: RTS4 Our lawyer is basically trying to negotiate that [EliteTech] sell our products to their customers as well. So part of the negotiation is whether they will finance this. The big problem with contract manufacturing is you often have to pay upfront because they have to go out and buy the components. So if you can negotiate and get [EliteTech] to agree to you only paying them for the finished product then you haven't really got a cash flow problem because you can line the customers up, which means you wouldn't be manufacturing unless you have customers [HEA-I10-A].
	FemMed: RTS6 When [FemMed] went into the US market, direct selling, that surgeon became our best preceptor surgeon. He trained a lot of our surgeons for us. He had the experience and because he was involved from a very early stage he has been amazing in terms of the clinical data. We have been able to publish that he has done all of these surgeries, these are the complications, these are the success rates, so that really gave us a good start in terms of having a good preceptor surgeon we could work with and also somebody who really has been shouting about [FemMed] from the hill tops [FEM-I11-B2].

Source: The Author

Figure 8-3: Network Modification Activities: Summary of Findings



Source: The Author

8.4.1 The Modification of Investor and Mentor Social Capital

Table 8-10 reports how INVs modify their investor and mentor social capital. Figure 8-3 also reports that all of these INVs used a variety of networking activities to modify their investor and mentor social capital. Interestingly, Table 8-10 provides evidence that the INVs predominately used ETS to modify their investor social capital. The researcher uses the term "eliminating ties" when there was strong evidence that the INVs decided to retrench (i.e. gradually phase out) a weak tie when it emerged this social capital provided no immediate benefit or became a liability to the firm. For example, Table 8-10 indicates that after Fertility formed ties with a Canadian VC syndicate in 2008, they attempted to extend this social capital over a six-month period. During this time, section 8.3.1 specifies that Fertility engaged in DB to extend this investor social capital, but after six months of due diligence the Canadian VC terminated this agreement.

A potential interpretation of these events is that Fertility were slow to modify this investor social capital. Consequently, this is most likely due to Fertility's DB with both Adam at UniNet and with the Canadian VC themselves. For example, Table 8-10 indicates that Fertility had no choice but to retrench this investor social capital after it became a liability to the firm. Figure 8-4 illustrates these social capital dynamics. That is, before this change, section 8.2.1 describes that Fertility used GRB via Adam at UniNet to connect with this tie. However, it appears Fertility's DB with both Adam at the Canadian VC syndicate led to a gradual decrease in the value of this social capital. Thus, when Fertility eventually decided to retrench this tie – e.g. after the VC withdrawn from negotiations – it appears that ETS had no real value, as this social capital was already a liability. Indeed, after this change, Fertility describes they continued to search for new investors and eventually formed ties with a local BAS who invested seed capital, but as section 8.3.1 outlines the firm also became impassive about bonding with potential investors. One interpretation of these findings indicates that Fertility shown weakness in being able to create, extend, or modify investor social capital.

Table 8-10: The Modification Investor and Mentor Social Capital

	Before the change			During the change		After the change	
	Tie year formation	Tie duration	Tie strength†	Source of change	Action^	Change in social capital	Change in networking activities
Investors							
Fertility – Canadian VC	2008	6 months	Weak	VC terminates agreement with firm	Retrenches the relationship after it became a liability	↓	Entrepreneur continues to create investor ties
HeartBeat – Indian VC	2007	6 months	Weak	VC terminates agreement with firm	Retrenches the relationship after it became a liability	↓	Entrepreneur continues to create investor ties
HeartBeat- US venture capitalist	2009	1 month	Weak	Entrepreneur has no trust that the VC would invest	Retrenches the relationship before it became a liability	↓	Entrepreneur creates ties with US angels
FemMed - BAS	2004	6 years	Strong	Angel's became "friends to us all"	Redeploys the relationship to support formation of US sales subsidiary	↑	Firm extends personal friendship with angel investors
Mentors							
Fertility – Co-founder	2003	6 years	Strong then weak	Entrepreneur loses trust in co-founder's commitment to venture	Retrenches relation after it became a liability	↓	Entrepreneur extends ties with business mentors
Fertility – Adam	2007	2 years	Strong	Entrepreneur felt contact was no longer important	Retrenches the relationship as no longer a priority	↓	Entrepreneur extends ties with other mentors
Fertility – George	2007	2 years	Strong	Entrepreneur felt contact was no longer important	Retrenches the relationship as no longer a priority	↓	Entrepreneur extends ties with other mentors
Fertility – Sean	2007	2 years	Strong	Entrepreneur felt contact was no longer important	Retrenches the relationship as no longer a priority	↓	Entrepreneur extends ties with other mentors
HeartBeat – US cardiologist	1995	14 years	Strong	Entrepreneur had great trust in cardiologist as a friend	Redeploys the relationship by making mentor a business partner	↑	Entrepreneur extends ties with US cardiologist
HeartBeat – Universities	2006	3 years	Strong	Entrepreneur encouraged universities to buy his products	Redeploys the relationship by making mentor a core customer	↑	Entrepreneur extends ties with universities
FemMed – Californian surgeon	2006	1 year	Strong	Californian surgeon offered to be a key opinion leader	Redeploys the relationship by making mentor a key opinion leader	↑	Firm extends friendship with surgeon
SafeMed – Local government advisor	2000	5 years	Weak	Loss of trust in actor's ability to source start-up grants	Retrenches this relationship as no longer a priority	↓	Firm decides to source investors through IPO

† There is no standard measure of tie strength in the literature because the nature of tie strength depends on the types of relations involved (Ozcan and Eisenhardt, 2009: 276). Thus, in line with Capaldo (2007) this study measures tie strength through the interaction frequency, resource intensity, and duration of each relationship. Thus, "weak" ties are those where there is a low frequency, low resource intensity and have formed over a short time period, i.e. less than one year. Whereas, "strong" ties are those where there is a high level of frequency, high allocation of resources and have formed over a long-time period, i.e. more than one year.

^ The author uses Helfat and Peteraf's (2003) various forms of resource modification (see section 2.4.3) to analyse the way in which INVs modify their social capital.

Source: The Author

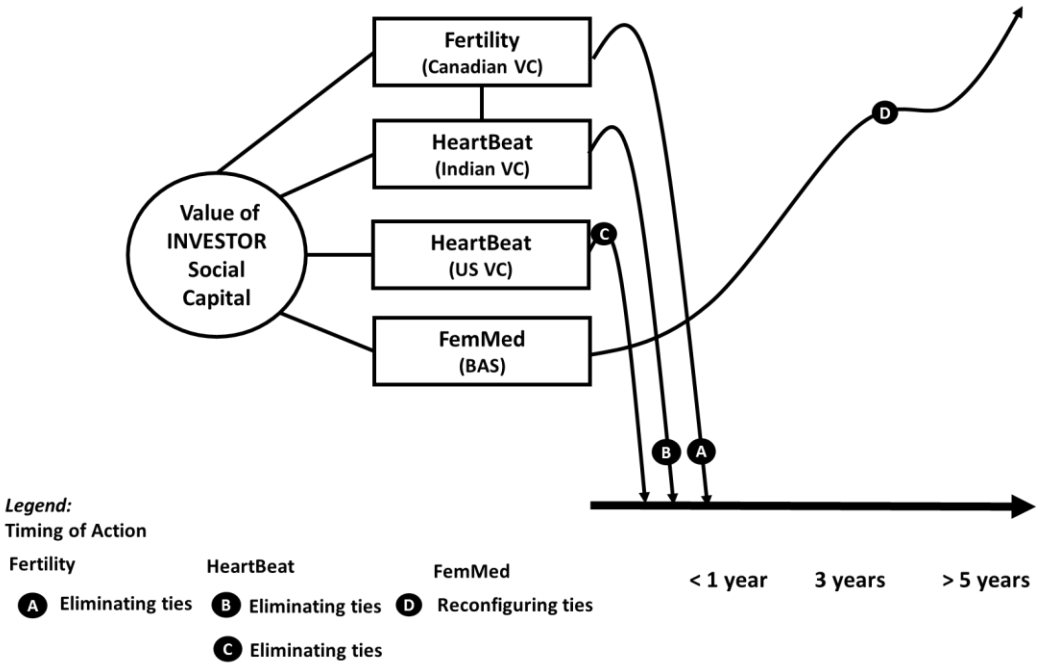
Table 8-10 also indicates that after HeartBeat used GAB to create social capital with an Indian VC syndicate in 2007, they used DB over a six-month period to extend this social

capital. However, due to the GFC on 2008-2009, the Indian VC syndicate also terminated their agreement. A similar interpretation of these events is HeartBeat's initial use of DB meant they were slow to modify this investor social capital. Table 8-10 then indicates that HeartBeat also had no choice but to retrench this social capital after it became a liability to the firm. Additionally, Figure 8-4 illustrates their late and slow response with using ETS to retrench their relationship with the Indian VC had no real value, as this social capital had become a liability. By contrast, Table 8-10 indicates that HeartBeat did re-attempt to create social capital with a US VC in 2009, which was at the peak of the GFC. However, after their experience with the Indian VC, HeartBeat's entrepreneur decided to retrench this tie before this social capital became a liability. Quotation ETS4 and ETS5 within Table 8-9, summarises the use of ETS to change these Indian and US VC relationships:

> So many friends of mine, you know, they're trying to get a company off the ground, and they're just spending so much time talking to potential investors and 99% of them aren't even in a position to invest even if they wanted to. So I think we learned that we wasted six months of our lives, that was a very negative kind of thing. So after that [elimination of VC] I decided we would just focus on doing what we could with our own resources. First of all, you have to survive. There's no point… if you can't survive…if you're not successful in raising capital and you're burning money, then you're stuck between a rock in a hard place. You'll just collapse, right? [HEA-I09-C].

A likely interpretation of this analysis is ETS led to a general decrease in this investor social capital. However, Figure 8-4 illustrates that HeartBeat retrenched this tie with the US VC syndicate much earlier, which meant they modified this social capital before it became a liability for the firm. Consequently, section 8.5 examines these practices in more depth with respect to the influence ETS has on NVI. However, as Table 8-10 highlights, this triggered a change in networking as HeartBeat used GRB via his friendship with the US cardiologist to create social capital with local US business angels who subsequently invested and supported the new venture's internationalisation.

Figure 8-4: The Modification of Investor Social Capital



Source: The Author

Table 8-10 also reports that FemMed decided to modify their investor social capital with Harmony a local BAS. However, by contrast there is evidence that Harmony used RTS as a mechanism to modify their investor social capital. Drawing on dynamic capability perspectives on redeployment (see section 3.4.3), the researcher uses the term "reconfiguring" to show that firms can modify an existing asset to serve a new, but closely related product or service market. From a social capital perspective, there is strong evidence that FemMed "redeployed" their existing relationship with Harmony by encouraging them to invest in the establishment of a US sales subsidiary as quotation AB8 within section 8.3.1 previously identifies. Figure 8-4 thus illustrates a likely interpretation of this analysis is that RTS with Harmony led to an overall increase in the value of this social capital. Thus, as the local BAS committed additional financial and human resource to FemMed's foreign operations, this increase in the value of social capital helped support NVI. Section 8.5 therefore elaborates on RTS influence on NVI.

Table 8-10 also reports on how INVs modify their mentor social capital. In contrast to the above, these cross-case findings show that this sample of INVs rarely used ETS to modify mentor social capital, with the exception of SafeMed and Fertility who retrenched two mentor ties. For example, after SafeMed's IBG with their local government advisor, which

section 8.3.1 elaborates on, they lost trust in their mentor's ability to source start-up funding, which meant eliminating this tie led to an overall decrease in the value of this social capital.

Whereas, Table 8-10 indicates that after Fertility's implicit use of IBG to extend social capital with its co-founder Dr Shi, the entrepreneur began to lose trust in the co-founder's commitment for the venture. This involved a six-month period, where the co-founder did not communicate with the executive board, which led to allegations that Dr Shi was working on Chinese R&D projects without the permission of Fertility's board. Incidentally, Fertility's entrepreneur describes that this relationship "went south very quickly" after they had discovered the co-founder no longer wanted to conduct R&D for the business. Quotation ETS4 within Table 8-9 emphasises these tensions:

> I think the thing with [Zhan], which was the most disappointment, was the lack of transparency in what he was doing. If he was scared, he should have been a man and said I'm scared. But he didn't and he just didn't produce. So he left us exposed, incredibly exposed and that was quite cowardly, so we took a huge hit for that [FER-I11-A].

One interpretation of these events is that Fertility were slow to use ETS, which led to a decrease in the value of this social capital. Therefore, Table 8-10 reports that this strong tie had become a weak tie, due to the low level of trust and irregular interaction between actors. Therefore, Figure 8-5 illustrates that Fertility's late and slow response at using ETS to change the relationship with Dr Shi had no real value since this social capital had already become a liability. By contrast, Table 8-10 also provides evidence that Fertility used PTS to modify their mentor social capital. The researcher uses the term PTS when there was strong evidence that the INVs decided to retrench (i.e. gradually phase out) a strong tie when the entrepreneurs no longer considered this tie as priority in the firm's international development. For example, Table 8-10 reports that Fertility were the only INV to use PTS as a mechanism to modify their investor social capital. Section 6.4 describes that over a three-year period, the researcher combined the critical incident and narrative sequence techniques to collect rich longitudinal data on Fertility's network development. During this iteration between data collection and analysis, the researcher and a second researcher[8] used depth interviews with the entrepreneur to map out the evolution of Fertility's network. Quotation PTS1, PTS2 and PTS3 is one narrative that illustrates this networking activity:

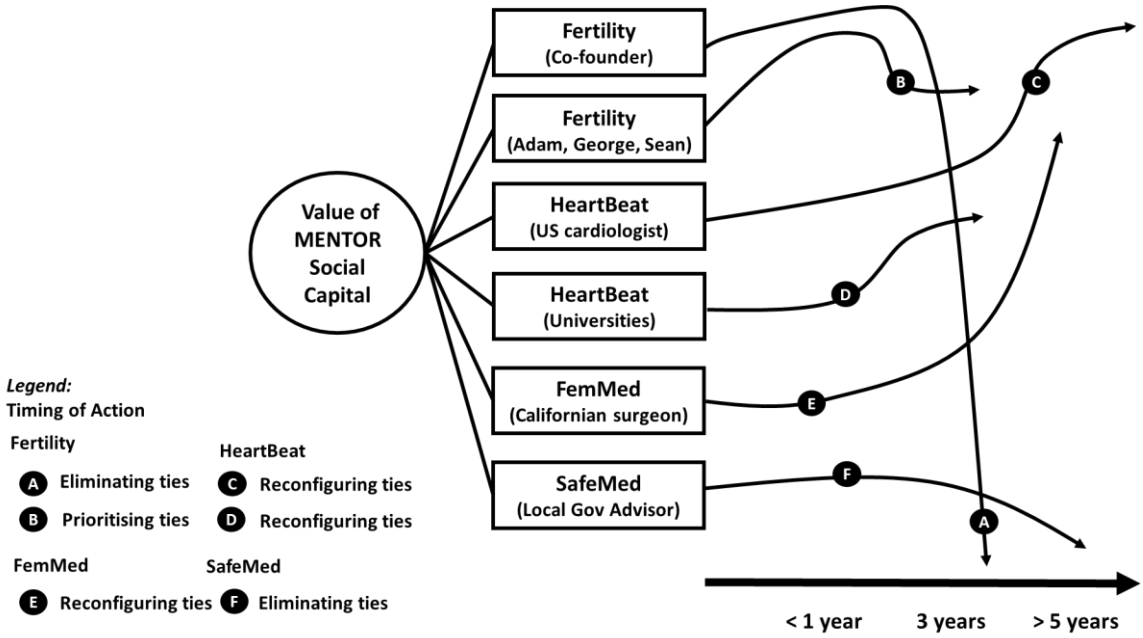
[8] The 'second researcher' is the researcher's academic supervisor who attended all of Fertility's semi-structured interviews.

> Get rid of those ones [Adam, George, Sean]. They aren't important anymore. Maybe at the time they were instrumental at getting me through those small little stages. But now I've got [Bob], and [Stephanie] here. So [Bob] is our new consultant who does sales, and [Stephanie] is our product marketing director/consultant. Those ones [Adam, George, Sean] are now outside my network but [Harry] he is still core [FER-I11-A].

A clear interpretation of these data is that following this research exercise, Fertility's entrepreneur was cognizant that they were PTS with individual mentors. The researcher also classifies these mentors as strong ties since the entrepreneur confirms that he had known them for over two years and committed a large amount of resource through regular interaction with them. A likely interpretation of the above narrative is since the entrepreneur believes these mentors were "instrumental" at the "small stages" – i.e. at international start-up – it is evident this triggered a decision to gradually modify this social capital as the firm began to internationally expand. Indeed, Figure 8-5 illustrates that Fertility's prioritising of these mentor ties decreased the value of this social capital, but not to the stage where these assets became a liability, as they maintained a reasonable level of value.

By contrast, Table 8-10 reports that HeartBeat and FemMed both used RTS as a mechanism to modify their mentor social capital. For example, HeartBeat's entrepreneur redeployed his existing relationship with Dr Arthur a US cardiologist through the joint agreement to establish a US-based IJV. Thus, section 8.3.1 reports that the use of AB meant they "had a meeting of minds" with respect to the commercialisation of a medical device for the iPhone. Consequently, Figure 8-4 illustrates a likely interpretation of this analysis is the use of RTS to modify the US cardiologist relationship led to a gradual increase in the value of this social capital. Thus, since Dr Arthur committed new financial and human resource to HeartBeat's foreign operations, this increase in the value of social capital helped support the new venture's international expansion, which section 8.5 examines in more depth.

Figure 8-5: The Modification of Mentor Social Capital



Source: The Author

Table 8-10 also reports that HeartBeat used RTS as a mechanism to modify its mentor social capital with universities. That is, section 8.2.2 reports that HeartBeat initially used GAB as mechanism to create this mentor social capital. However, there is strong evidence from section 8.3.2 that once the HeartBeat used AB to strengthen these ties, the entrepreneur identified an opportunity to redeploy this social capital, as these mentors became the firm's core customer. Consequently, the entrepreneur describes that HeartBeat collaborated with the universities on co-R&D projects, which meant they were compelled to buy the firm's products. Moreover, the universities also published that they used HeartBeat's products in top-tier academic journals, which led to surge in international sales. Therefore, Figure 8-5 illustrates that HeartBeat's use of RTS lead to an increase the value of this mentor social capital. Section 8.5.1 therefore elaborates on RTS influence on HeartBeat's subsequent international expansion.

Table 8-10 similarly reports that FemMed used RTS as mechanism to modify its mentor social capital. Namely, section 8.2.2 reports that FemMed also used GAB to create mentor social capital with a Californian surgeon. As section 8.3.2 describes, FemMed and the Californian surgeon implicitly engaged in AB to form an intellectual and emphatic connection over the altruistic value of the firm's unique technology. Consequently, there is strong evidence that FemMed identified an opportunity to redeploy this initial social capital,

when the Californian surgeon expressed his willingness to have a greater involvement in the business. Quotation RTS6 within Table 8-9 illustrates how FemMed's use of RTS helped modify this mentor social capital:

> When [FemMed] went into the US market, direct selling, that [Californian] surgeon became our best preceptor surgeon. He trained a lot of our surgeons for us. He had the experience and because he was involved from a very early stage he has been amazing in terms of the clinical data. We have been able to publish that he has done all of these surgeries, these are the complications, these are the success rates, so that really gave us a good start in terms of having a good preceptor surgeon we could work with and also somebody who really has been shouting about [FemMed] from the hill tops [FEM-I11-B2].

One interpretation of these data is that FemMed shown strength in practicing RTS to change their relation with the Californian surgeon. That is, the above narrative explains the Californian surgeon became a "preceptor surgeon" whose endorsement amongst American surgeons evidently helped the firm's US expansion. There is then clear evidence that FemMed changed and strengthened the nature of this tie since the Californian surgeon committed additional resource and became a KOL who regularly interacted with the firm. Consequently, Figure 8-5 then illustrates this networking activity led to a rapid increase in the value of this mentor social capital. These cross-case findings then indicate that this sample of INVs used a combination of networking activities in order to modify their investor and mentor social capital.

8.4.2 The Modification of Buyer and Supplier Social Capital

Table 8-11 reports how INVs modify their buyer and supplier social capital. In contrast to section 8.4.1, Figure 8-3 reports that only two of the INVs (e.g. Fertility and FemMed) were found to modify their buyer social capital, while all of INVs appear to use a variety of networking activities to modify their supplier social capital. For example, Table 8-11 indicates that FemMed formed ties with a US distributor in 2005, and attempted to extend this social capital over a nine-month period. During this time, section 8.3.2 specifies that FemMed were impassive in their bonding with this US distributor, which meant despite perfunctory attempts to extend this social capital, they decided to retrench this tie. A clear interpretation of these data is that FemMed retrenched its tie with this US distributor. There is also strong evidence that this relation was a weak tie, as the entrepreneur describes their increasing lack of trust in the US distributor, and the irregular interaction that took place between actors. Consequently, it appears that FemMed's IBG with the US distributor led to

a gradual decrease in the value of this buyer social capital. Thus, when FemMed eventually decided to retrench this weak tie – e.g. after realising the distributor would not sell their products – it appears that using ETS had little value, as this social capital was already a liability. Figure 8-6 also illustrates that FemMed were slow to modify this tie despite the gradual decrease in the value of this social capital.

Nevertheless, section 8.5.3 describes despite the firm's slow response, this decision to retrench this social capital did trigger the firm's re-entry into the US through the establishment of a foreign sales subsidiary. Therefore, despite the decrease in this social capital, section 8.5.3 does specify that ETS helped modify this buyer social capital. Table 8-11 also reports that Fertility used ETS as a mechanism to modify its buyer social capital. For example, section 8.2.3 reports that Fertility used GRB as a mechanism to create buyer social capital with an EU MNE who agreed to license their technology.

Table 8-11: The Modification of Buyer and Supplier SC

	Before the change			During the change		After the change	
	Tie formation year	Tie duration	Tie strength†	Source of change	Action^	Change in social capital	Change in networking activities
Buyers							
Fertility – European licensor	2008	1 year	Weak	Entrepreneur loses focus to implement license strategy	Retrenches the relationship before it became a liability	↓	Entrepreneur creates new ties with sales agents and suppliers
Fertility – Canadian distributor	2010	6months	Strong	Distributor is encouraged to financially invest in firm	Redeploys relationship as buyer becomes an investor	↑	Entrepreneur becomes more "creative" in raising finance
FemMed – US distributor	2006	9months	Weak	Distributor does not sell the firm's products	Retrenches the relationship after it became a liability	↓	Firm creates ties with a US key opinion leader
Suppliers							
Fertility – English manufacturer	2009	9months	Weak	Loss of trust in manufacturers production capabilities	Retrenches the relationship due to quality issues	↓	Entrepreneur decides to internalise production
HeartBeat– Local manufacturer	2005	5 years	Strong	Manufacturer did not have FDA regulatory approval	Retrenches the relationship before it becomes a liability	→	Entrepreneur avoids relational lock-in
HeartBeat– HK manufacturer	2010	6months	Strong	Manufacturer is encouraged to financially invest in the firm	Redeploys relationship as supplier became a buyer and investor	↑	Entrepreneur creates new ties in this US market
FemMed – French manufacturer	2005	2 years	Weak	Lost trust in manufacturers production capabilities	Retires the relationship before it became a liability	↓	Firm creates new ties with local Scottish manufacturer
SafeMed – R&D consultants	2005	3 years	Weak	Lost trust in suppliers R&D capabilities	Retrenches relationship after it became a liability	↓	Firm decides to internalise R&D

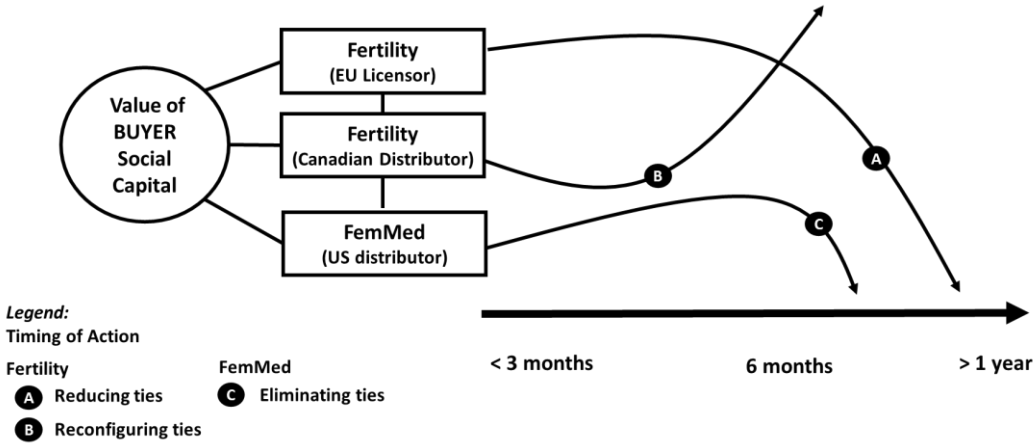
† There is no standard measure of tie strength in the literature because the nature of tie strength depends on the types of relations involved (Ozcan and Eisenhardt, 2009: 276). Thus, in line with Capaldo (2007) this study measures tie strength through the interaction frequency, resource intensity, and duration of each relationship. Thus, "weak" ties are those where there is a low frequency, low resource intensity and have formed over a short time period, i.e. less than one year. Whereas, "strong" ties are those where there is a high level of frequency, high allocation of resources and have formed over a long-time period, i.e. more than one year.

^ The author uses Helfat and Peteraf's (2003) various forms of resource modification (see section 2.4.3) to analyse the way in which INVs modify their social capital.

Source: The Author

Interestingly, the entrepreneur describes that after this initial agreement, it became apparent the licensor began to lose interest following the emergence of similar technology. Consequently, the entrepreneur describes that following this event, they rarely interacted with the EU licensor. Subsequently, the entrepreneur describes after bonding with Harry and Angus, these mentors encouraged Fertility to change their internationalisation strategy and focus on selling products through agents and distributors. This advice then motivated Fertility to retrench this weak tie, which indicates ETS was an important mechanism that helped modify this buyer social capital. Figure 8-6 therefore illustrates that Fertility retrenched this tie with the EU licensor much earlier than FemMed's attempt, which indicates a more proactive attempt to modify buyer social capital before it became a liability to the firm.

Figure 8-6: The Modification of Buyer Social Capital



Source: The Author

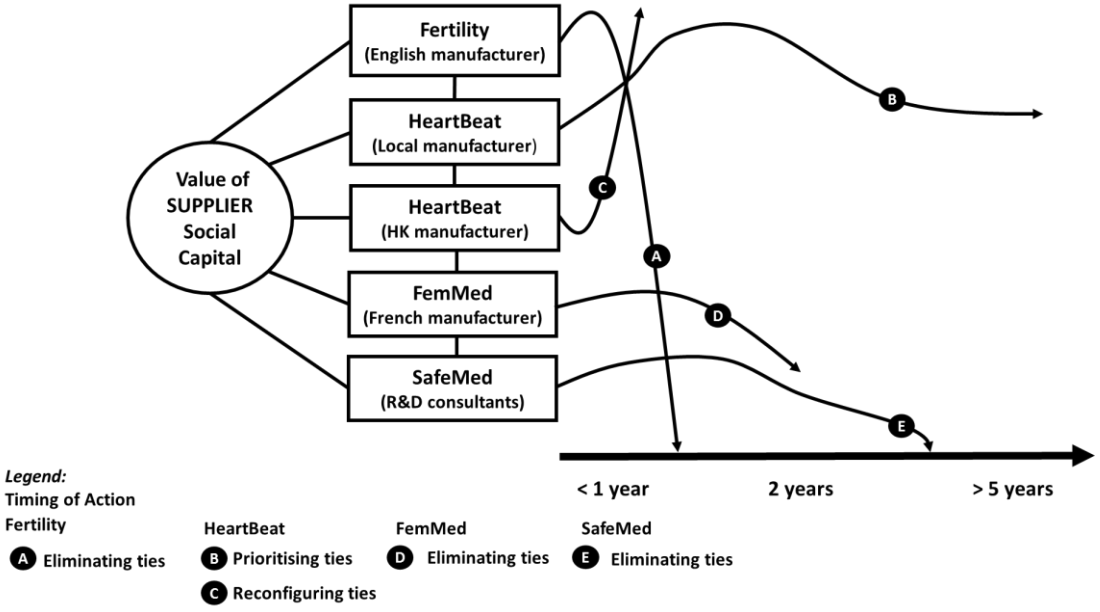
Table 8-11 also reports that Fertility used RTS as mechanism to modify its buyer social capital. That is, there is strong evidence that Fertility encouraged the Canadian distributor to fund their Canadian regulatory approval and product launch. Quotation RTS1 within Table 8-11, summarises the nature of how Fertility were reconfiguring ties with this foreign customer:

> Just off the phone with Canada today and their order is three times what I expected, and they have just doubled again, so that is 6 times what I expected as initial order. But I don't have any money, so we have had to say look, we don't have any money to do this, and they said look, what do we have to give you to get it done. So we brought somebody in and they said you can pay them to finish the registration and we will discount it against the order when you are placing it. So definitely getting more creative with how we finance ourselves in this time, where traditionally banks were there. They are not there for you, they don't give a shit, I'm not a bank fan [FER-I11-A].

One interpretation of these data is that Fertility used RTS to redeploy their tie with the Canadian distributor, which helped increase the value of this buyer social capital. For example, the above narrative explains that Fertility encouraged the Canadian distributor to invest in the business if they wanted to secure their products. There is then clear evidence that Fertility had strengthened the nature of this tie since the Canadian distributor committed financial resource by funding the Canadian regulatory approval and the initial production launch. Consequently, Figure 8-6 illustrates that the redeployment of this tie led to an overall increase in the value of this buyer social capital.

By contrast, Table 8-11 reports there is strong evidence on how INVs modify their supplier social capital. For example, cross-case findings indicate that three (e.g. Fertility, FemMed and SafeMed) of the four INVs used ETS as a mechanism to modify their supplier social capital. For example, one point of comparison is that Fertility and FemMed both describe how they changed their relations with local manufacturers. However, it is evident from the cross-case analysis that these firms differed in using ETS at local or global level. In Fertility's case, section 8.2.4 reports that the firm used LRB to form ties with an English manufacturer in order to quickly get products to market. However, during this time Fertility began to encounter quality problems with the English manufacturer, which led to a loss in trust in the manufacturer's existing production capabilities. Furthermore, the entrepreneur also confirms that they rarely interacted with the English manufacturer and did not resolve these quality issues.

Figure 8-7: The Modification of Supplier Social Capital



Source: The Author

Instead, Table 8-11 reports that Fertility decided to retrench this weak tie due to quality issues, which indicates the firm used ETS as a mechanism to modify this supplier social capital. Consequently, Figure 8-7 illustrates that eliminating this tie led to a decrease in the value of this supplier social capital. Moreover, Fertility were slow to retrench this tie with the English manufacturer, which meant the use of ETS had little value since this social capital was already liability. Similarly, section 8.4.1 reports that Fertility were also slow at using ETS with a Canadian VC, which indicates some weakness with respect to how they modify their social capital.

Table 8-11 also reports that FemMed were slow to modify their supplier social capital. That is, section 8.2.4 specifies that FemMed attended US trade fairs and used GSB as mechanism to form ties with a French manufacturer. Like Fertility, FemMed also began to encounter quality problems with their French manufacturer, which led to a loss in trust in the manufacturer's production capabilities. Additionally, the entrepreneur also confirms that given their French location, the firm found it difficult to interact with this subcontractor and resolve these quality issues. Consequently, Table 8-11 confirms that FemMed decided to retrench this weak tie, and used ETS as a way to modify this supplier social capital. Figure 8-7 also illustrates the similarities between these firms as this late response at using ETS meant this social capital had already become a liability.

Evidence of this networking activity was also apparent in SafeMed as they used ETS as a way to modify their social capital with a group of Chinese and American R&D consultants. In this case, section 8.2.4 specifies that SafeMed used GSB to form ties with R&D consultants who supported the firm's commercialisation. Consequently, section 8.3.2 reports that SafeMed had become increasingly impassive about extending this social capital. Indeed, one interpretation is over a three-year period, there is strong evidence this relationship would hinder their NVI. Incidentally, quotation ETS1 within Table 8-9 emphasises SafeMed's decision to modify this supplier social capital:

> We have spent five years doing R&D, that's another story. You can help me write my book about [SafeMed]. We have had several partners on the R&D side. We went through numerous consultants, who helped us then hindered us. So we changed design consultants about three times [SAF-I10-B].

A clear interpretation of these data is that SafeMed used ETS as a mechanism to modify this social capital. However, this narrative in combination with Figure 8-7 is the clearest indication that SafeMed's impassiveness towards their R&D consultants had led to gradual decrease in the value of this social capital. Consequently, it is evident that SafeMed were slow to modify this social capital, which indicates this was a significant burden for the firm. Therefore, an interesting finding is that each of the firm's attempt at using ETS was in response to a decrease in the value of supplier social capital. Therefore, this indicates that firms are most likely to use this networking activity when there is scant chance of improving the strength of a relationship. By contrast, Table 8-11 reports that HeartBeat retrenched its ties with a local manufacturer, but unlike Fertility and FemMed, they decided to modify a strong tie. That is, section 8.2.4 reports that HeartBeat used LSB as a mechanism to form ties with a local manufacturer in order to start production. However, the entrepreneur describes despite their trustworthy relationship with the local manufacturer, they had reached a phase that required a partner with advanced production capabilities to support their international expansion. Quotation PTS4 within Table 8-9 consequently provides additional context on this situation:

> So we have finished up with our local manufacturer. The problem is we had to change due to the regulatory, as we now have to all the CE mark testing and everything. To sell into Europe we have to have a certified manufacturer who meets all the quality standards. So we now have our [Hong Kong manufacturer] up and going. So they will be able to scale up our manufacturing and they can produce more product in a day than our [local] manufacturer could produce in a month [HEA-I10-A].

A clear interpretation of these data is that HeartBeat used PTS as a mechanism to modify this supplier social capital. Moreover, Figure 8-7 illustrates that HeartBeat's use of PTS decreased the value of this social capital, but not to the extent where this asset became a liability. Incidentally, the narratives indicate that HeartBeat shown a strength in being able to reduce its dependency with a supplier by moving to a new supplier with advanced production capabilities. Finally, Table 8-11 reports that HeartBeat were only the firm to use RTS as a mechanism to modify their social capital. In this case, section 8.2.3 specifies that HeartBeat used GRB as mechanism to form ties with a Hong Kong manufacturer who as quotation PTS4 describes agreed to mass-produce their product. The entrepreneur then describes that within a six-month period, HeartBeat attempted to redeploy this social capital. Quotation RTS4 within Table 8-9 provides insight into the firm's attempt at reconfiguring this tie:

> Our lawyer is basically trying to negotiate that [EliteTech] sell our products to their customers as well. So part of the negotiation is whether they will finance this. The big problem with contract manufacturing is you often have to pay upfront because they have to go out and buy the components. So if you can negotiate and get [EliteTech] to agree to you only paying them for the finished product then you haven't really got a cash flow problem because you can line the customers up, which means you wouldn't be manufacturing unless you have customers [HEA-I10-A].

One interpretation of these data is that HeartBeat were effective at using RTS to change their relation with the Hong Kong manufacturer. That is, the above narrative explains that the Hong Kong manufacturer became a customer and investor in the business. There is then clear evidence that HeartBeat strengthened the nature of this tie since the Hong Kong manufacturer committed additional resource as they agreed to fund the cost of production prior to the sale of product. Consequently, Figure 8-7 illustrates this networking activity led to a rapid increase in the value of this supplier social capital. Section 8.5.2 therefore examines RTS influence on NVI. These cross-case findings then indicate that the sample of INVs primarily used ETS to modify their buyer social capital, while they used a combination of networking activities to modify their supplier social capital.

Table 8-12: Networking Activities Induced from Data Analysis

Networking activities (second-order concepts)	Definition
A. Local referral bridging (Referrals + local connection)	When the ego uses an alters referral to create a local tie
B. Global referral bridging (Referrals + global connection)	When the ego uses an alters referral to create a foreign tie
C. Local search bridging (Search + local connection)	When the ego searches new networks to create a local tie
D. Global search bridging (Search + global connection)	When the ego searches new networks to create a foreign tie
E. Global acceptance bridging (Approach + global connection)	When an ego accepts an alter's request to form a global tie
F. Impassive bonding (High intensity + Low frequency)	When the ego commits a large amount of resource to the alter but limits interaction following disinterest in this social capital
G. Dependency bonding (High intensity + High frequency)	When the ego commits a large amount of resource to interact frequently with the alter due to their reliance on the future outcomes of this social capital
H. Affinity bonding (Low intensity + High frequency)	When two actors instantly bond through an intellectual, cultural, or empathic connection
I. Eliminating ties (Weak ties + Retrenchment)	When the ego decides to retrench a weak tie
J. Prioritising ties (Strong ties + Retrenchment)	When the ego decides to retrench a strong tie
K. Reconfiguring ties (Strong ties + Redeployment)	When the ego decides to redeploy a strong tie for a new purpose

Source: The Author

Finally, Table 8-12 defines the various networking activities that create, extend, and modify their social capital. Thus, this cross-case analysis found that INVs use a combination of eleven networking activities in an implicit attempt to increase the value of their social capital. The next section will therefore consider why certain networking activities enable or inhibit NVI.

8.5 RQ4: Why do certain networking activities enable or inhibit new venture internationalisation?

This section reports the cross-case findings on why certain networking activities enable or inhibit NVI. This section uses case-ordered effects matrices (Miles and Huberman, 1994) as an analytical tool to order and explain why certain networking activities enable or inhibit NVI. However, in accordance with Saldaña's (2003) arguments on longitudinal qualitative data analysis, the researcher examines the "influence" rather than "effects" of specific networking activities to avoid over precise predictions. Moreover, the following displays report longitudinal data that provide evidence on the initial and subsequent influence of networking activities on NVI. Table 8-13 therefore presents a summary of this section's

cross-case findings and will now discuss the influence of each of these networking activities on NVI.

Table 8-13: Enablers and Inhibitors: Summary of Findings

	Fertility	HeartBeat	FemMed	SafeMed	Outcome
Network creation activities					
Local referral bridging	Both	Enabler	-	-	Capability based
Global referral bridging	Both	Both	Enabler	Inhibitor	Capability based
Local search bridging	-	Enabler	Enabler	Inhibitor	Capability-based
Global search bridging	Inhibitor	Inhibitor	Inhibitor	Inhibitor	Inhibitor
Global acceptance bridging	Enabler	Enabler	Enabler	-	Enabler
Network extension activities					
Affinity bonding	Enabler	Enabler	Enabler	-	Enabler
Dependency bonding	Both	Inhibitor	Enabler	Inhibitor	Capability based
Impassive bonding	Inhibitor	-	Inhibitor	Inhibitor	Inhibitor
Network modification activities					
Eliminating ties	Enabler	Enabler	Enabler	Inhibitor	Capability based
Prioritising ties	Enabler	Enabler	-	-	Enabler
Reconfiguring ties	Enabler	Enabler	Enabler	-	Enabler

"Enabler" refers to when there was multiple evidence across cases that a specific networking activity enabled NVI.
"Inhibitor" refers to when there was multiple evidence across cases that a specific networking activity inhibited NVI.
"Both" refers to when there was evidence of both strong and weak practice when performing a networking activity, which enabled and inhibited NVI.
"Neutral" indicates there was not enough evidence to determine whether the networking activity enabled or inhibited NVI.
"Capability based" assumes the strength of capability determines whether a networking activity enables or inhibits NVI opposed to the specific activity itself.

Source: The Author

8.5.1 Network Creation Activities Influence on NVI

Table 8-14 reports why certain network creation activities enable or inhibit NVI. It is also important to emphasise that Table 8-14 aggregates Appendix 7, which presents a more granular cross-case data analysis. To begin with, Table 8-13 reports that two (e.g. Fertility and HeartBeat) of the four INVs were found to use LRB as a mechanism to create social capital. Consequently, Table 8-13 reports that LRB appears to have a varied influence on each of these new ventures' internationalisation. Incidentally, this finding indicates there is evidence of stronger and weaker practices in terms of how these INVs perform this networking activity. These stronger and weaker practices therefore give insight into why certain LRB activities enable or inhibit NVI.

Firstly, Table 8-14 reports on Fertility's attempts at using LRB to create social capital. Indeed, Appendix 7A specifies that Fertility initially used LRB to form ties with mentors, and subsequently used LRB to form ties with buyers and suppliers. Consequently, Appendix 7A provides evidence that Fertility's early use of LRB was effectual in forming ties with Harry and Angus, but these mentors did not initially enable NVI. However, Fertility's entrepreneur describes the biggest benefit of forming ties with Harry and Angus was they

provided early emotional and business support on how to commercialise a medical device. However, over a three-year period, the entrepreneur does describe that these mentors introduced Fertility to an EU MNE labelled as HealthMed who initially provided international marketing advice and subsequently agreed to distribute the firm's products. Nevertheless, section 8.3.1 specifies that Fertility also used AB to extend this social capital. Thus, one possible interpretation of these data is that Fertility shown strong practices in LRB with mentors, which combined with AB brought long-term benefits and enabled NVI.

Table 8-14: Network Creation Activities Influence on New Venture Internationalisation†

	Fertility		HeartBeat		FemMed		SafeMed	
	Initial influence on NVI^	**Subsequentˇ influence on NVI**	**Initial influence on NVI**	**Subsequent influence on NVI**	**Initial influence on NVI**	**Subsequent influence on NVI**	**Initial influence on NVI**	**Subsequent influence on NVI**
Local referral bridging (LRB)								
Stronger practises	(□) Local mentors provided business and emotional support but no influence on NVI	**(▲+AB)** These mentors introduced the entrepreneur to an EU distributor which enabled NVI	**(+)** Local mentor helped secure R&D grants, PCT patent applications and US FDA approval	**(▲+AB)** Mentor provided emotional and business support which enabled NVI	(□) No involvement in LRB		(□) No involvement in LRB	
Weaker practices	(□) Used LRB to connect with investors, mentors, suppliers and buyers who had no influence on NVI	**(▼+ DB & IB)** New ties with investors, mentors and suppliers formed through LRB inhibited NVI	(□) The majority of the entrepreneur's bridging activities were globally focussed					
Global referral bridging (GRB)								
Stronger practises	**(+)** Used GRB to form ties with foreign buyers who brought sales, reputational benefits and access to foreign market knowledge	**(▲+DB)** New ties with foreign buyers continued to generate international sales which enabled NVI	**(+)** Used GRB to form ties with mentors, investors, suppliers and buyers who had a positive influence on NVI	**(▲+AB & RT)** GRB helped gain access to foreign R&D networks, angel investment, and signed production and distribution agreements	(□) Did not use GRB until later on its international development	**(▲)** Used GRB to source by using an M&A specialist to identify and secure an suitable strategic buyer		
Weaker practices	**(+)** Used GRB to form ties with EU licensor and Canadian VC which had growth opportunities	**(▼+ DB)** Buyer and investor both terminated agreements which inhibited NVI	**(-)** Used GRB to form ties with a US VC, despite lack of commitment from VC to invest	**(▼+ ET)** No longer used GRB and retrenched ties to prevent additional costs	(□) No sign of weaker practices due to limited performance of the activity		**(+)** Used GRB to form ties with two USA suppliers and one buyer, which initial reputational benefits	**(▼+ DB & IB)** Signed imbalanced production and sales agreements which inhibited NVI
Local search bridging (LSB)								
Stronger practises	(□) No involvement in LSB		**(+)** Used existing local networks to source a trustworthy local manufacturer, which had a positive influence on NVI	**(□+ PT)** Local manufacturer never had regulatory approval to produce product, which meant firm used GRB instead	**(+)** Used LSB to source a BAS and suitable manufacturer while operating with the US market	**(▲+AB & RT)** Local investor and supplier was they both enabled NVI		

Weaker practices							**(+)** Used LSB to source a government advisor and a corporate law firm to source grants and launch an IPO	**(▼+ IB)** stopped interacting with mentor and the IPO meant they were not eligible for government grants, which inhibited NVI
Global search bridging (GSB)								
Stronger practises	(□) No involvement in LSB	-	(□) No involvement in LSB	-				
Weaker practices					**(-)** Used GSB to source strategic buyer, distributor and manufacturer who delayed NVI	**(□+ DB & IB)** Poor use of GSB as both ties were unsuitable and inhibited NVI	**(-)** Used GSB to initially source investors, mentors, buyers and suppliers who all delayed NVI	**(□+ DB & IB)** Poor uses of GSB as all these ties inhibited NVI
Global acceptance bridging (GAB)								
Stronger practises	**(+)** Used GAB with foreign buyer to tap into their sales network	**(□+DB & RT)** GAB led to foreign sales revenues which enabled NVI	**(+)** GAB with a US mentor provided friendship, R&D, sales expertise	**(▲+AB & RT)** US mentor became key opinion leader who enabled NVI	(+) GAB with a US mentor encouraged them to establish a US sales subsidiary	**(▲+AB & RT)** US mentor became key opinion leader who enabled NVI	(□) No opportunity of GAB	
Weaker practices			(-) GAB with Indian VC became a burden	**(▼+ DB)** GAB with Indian VC inhibited NVI				

† This table is a summary of Appendix 7, which provides a more granular cross-case analysis.

^ "NVI" refers to NVI. In accordance with Zahra and George (2002), Jones and Coviello (2005) and Oviatt and McDougall (2005) the researcher analysed NVI with respect to: (1) inward/outward cross-border activities (i.e. R&D, production or sales), (2) speed (i.e. the length of time between foundation and foreign market entry) and scope (i.e. the (3) extent to which the new venture enters foreign markets outside its home region)

(+) refers to the initial benefits a specific networking activity had on NVI: while (-) refers to the initial problems a networking activity had on NVI

(▲) refers to networking activities that enabled NVI over the long-term: while (▼) refers to networking activities that inhibited NVI or the long term

(▲+…) indicates that a combination of networking enable NVI: **(▼+…)** indicates that a combination of networking activities inhibit NVI

"AB" refers to affinity bonding; "DB" refers to dependency bonding; "IB" refers to impassive bonding; "ET" refers to eliminating ties; "PT" refers to prioritising ties; "RT" refers to reconfiguring ties

(□) refers to networking activities that appear to have no clear influence on NVI

Source: The Author

By contrast, Table 8-14 reports that Fertility's LRB practices also inhibited NVI. For example, section 8.2.1 specifies that Fertility used LRB to form ties with Adam, George, and Sean who were a local group of mentors. Consequently, the entrepreneur describes George and Sean as both "local guys" who appear to have had no influence on their NVI. Whereas, Appendix 7A reports that Adam at UniNet initially provided the firm with an interest-free start-up loan, workspace and mentoring. Subsequently, after this LRB, Adam referred Fertility to an EU licensor and Canadian VC syndicate. In both cases, Fertility signed an initial agreement to collaborate with these firms. However, within less than one year, sections 8.3.1 and 8.4.1 specify that due to Fertility's DB and IBG, the EU licensor and Canadian VC both terminated their initial agreements, which placed a six-month delay on the firm's commercialisation. Therefore, a possible interpretation of these findings is that Fertility were weak in using LRB given the entrepreneur's decision to create social capital with Adam at UniNet, who subsequently inhibited NVI.

Whereas, Table 8-14 reports evidence that HeartBeat's use of LRB in combination with AB enabled NVI. For example, section 8.2.1 specifies that HeartBeat's entrepreneur initially used LRB to form ties with Debbie – a local government advisor – who helped the firm secure R&D grants, file for a PCT application and US FDA approval. Subsequently, section 8.3.1 specifies that the entrepreneur used AB to build an inter-personal relation with Debbie, which helped the firm secure innovation grants and provided emotional and business support. Thus, one possible interpretation of these findings is that HeartBeat shown a strength in using LRB as these practices subsequently enabled NVI. Given that Table 8-14 reports cross-case evidence of both stronger and weaker practices, the researcher assumes that LRB can either enable or inhibit NVI. Thus, the ability of each INV to practice LRB in combination with bonding activities seems to influence whether these activities will enable or inhibit NVI.

Table 8-14 also reports that the INVs' vary in their ability to use GRB as a mechanism to create social capital, as there is evidence this activity can enable or inhibit NVI. That is, three (e.g. Fertility, HeartBeat and FemMed) of the four INVs show a strength in using GRB as they formed ties with investors, mentors, buyers and suppliers. For example, Fertility used GRB to form ties with foreign buyers, who provided international sales, reputational and foreign market knowledge benefits. Incidentally, section 8.3.2 specifies that following a period of DB, these ties with foreign buyers (e.g. EU distributor and Chinese distributor) helped generate international sales and subsequently enabled NVI. Moreover, Appendix 7B

reports that HeartBeat also used GRB to create social capital with mentors, investors, buyers, and suppliers, which had the initial benefit of gaining access to foreign R&D networks and angel investment. Consequently, sections 8.3.1 and 8.3.2 specify that after a period of using AB and RTS, the firm was able to sign a foreign production and distribution agreement with EliteTech, a Hong Kong based MNE. Thus, one likely interpretation of these findings is this repeated practice of GRB in combination with the above networking activities helped enable HeartBeat's NVI.

Interestingly, section 8.2.3 reports that FemMed initially used GSB as mechanism to create social capital with strategic buyers, which was unsuccessful. However, Table 8-14 reports that during the firm's international expansion, HeartBeat decided to hire an M&A specialist and use GRB in a reattempt to create social capital with a new strategic buyer. Consequently, FemMed used GRB to identify and secure a suitable strategic buyer, which provided the founders and investors with a strategic exit. Nevertheless, Table 8-14 provides evidence that Fertility, HeartBeat, and SafeMed shown a weakness in practicing this GRB activity. For example, section 8.2.1 specifies that SafeMed used GRB to form ties with a US distributor and two US manufacturers, which brought initial reputational and financial benefits as news of this agreement increased the firm's share price. However, there is strong evidence that SafeMed shown a weakness in practicing GRB as section 8.3.2 describes that they had formed ties with the wrong foreign actors.

This led the US buyers and suppliers to terminate these initial agreements with SafeMed, as they were unable to deliver the terms of their initial contract. Thus, one possible interpretation of these findings is that SafeMed's initial practice of GRB appears to have indirectly inhibited their NVI. That is, if SafeMed conducted more extensive due diligence and negotiated a superior agreement before forming strategic alliances with these partners, it is likely there would have been a greater chance of increasing the value of this social capital. Thus, one possible interpretation of these findings is the ability of each firm to practice GRB is also contingent on using bonding activities, which seems to influence whether this networking activity will enable or inhibit NVI.

Table 8-14 also reports that three (HeartBeat, FemMed and SafeMed) of the four INVs used LSB as a mechanism to create social capital, yet, this activity was only used to form ties with a limited range of actors. For example, HeartBeat initially used LSB to source a local manufacturer, but this supplier did not have the regulatory approval to produce medical

products outside its domestic market. Interestingly, section 8.2.1 indicates that SafeMed also used LSB to form ties with a local government advisor and corporate law firm. That is, Table 8-14 reports this initial activity helped SafeMed secure two early stage R&D grants. Soon after these grants, SafeMed then decided to pursue an IPO to raise start-up capital. Nevertheless, Appendix 7C reports that SafeMed's IBG and early pursuit of an IPO meant they were unable to secure future R&D grants. One possible interpretation of these findings is that SafeMed shown a weakness in practicing LRB as after they formed a connection with a mentor, they did not extend these ties, which decreased this social capital value. Thus, this initial use of LRB in combination with IBG appears to have inhibited their NVI.

By contrast, Table 8-14 reports that FemMed's use of LSB in combination with AB and RTS enabled their NVI. For example, Appendix 7C reports that FemMed used LSB to form ties with Harmony – a local BAS – who initially provided seed capital and access to foreign market knowledge. Subsequently, sections 8.3.1 and 8.4.1 specifies that the firm used AB to build an inter-personal connection and used RTS as mechanism to support their continued expansion within the US market. Thus, one possible interpretation of these findings is that FemMed shown an initial strength in practising LSB through the selection of a valuable partner, which combined with the above activities, enabled NVI. Given that Table 8-14 reports cross-case evidence of both stronger and weaker practices, the researcher assumes that LSB can either enable or inhibit NVI.

Interestingly, there is strong evidence that GSB inhibits NVI. That is, Table 8-14 reports that only two (FemMed and SafeMed) of the four INVs used GSB as a mechanism to create inter-organisational social capital. Nevertheless, in these cases there is strong evidence that early use of GSB had a negative influence on each of the firm's immediate and long-term development. For example, section 8.2.3 reports that FemMed used GSB to form ties with foreign buyers and suppliers, who initially delayed NVI. Moreover, section 8.4.2 reports that FemMed engaged in DB and IBG with these ties, which indicates a weakness in being able to practice GSB in order to source and select suitable strategic partners. Consequently, Appendix 7D reports a similar situation in SafeMed as they predominately used GSB to create social capital with a wide range of investors, mentors, buyers, and suppliers.

There are potential conflicting interpretations here, as these weaker practices could simply suggest that both FemMed and SafeMed did not have the sufficient networking capability to perform this activity. However, given these firms used GSB at an early stage of their

development to form inter-organisational rather than inter-personal ties, another interpretation is this activity is more effectual at later stages of international development. Moreover, given Fertility and HeartBeat did not use GSB as initial networking activity and are younger in age, a likely interpretation is this activity is more likely to be effectual when INVs are in a unique strategic position to form ties with such buyers and suppliers. Furthermore, since section 8.3.2 reports that both firms used DB and IBG after their use of GSB when they initially formed buyer ties. Therefore, one possible interpretation of these findings is these firms never had the unique resources to create this social capital. Thus, based on these specific data, the researcher assumes the *early* use of GSB before they own unique resources is likely to inhibit NVI.

By contrast, there is strong evidence that GAB enables NVI. That is, Table 8-14 reports that three (Fertility, HeartBeat and FemMed) of the four INVs used GAB to create social capital. In each of these cases, Appendix 7E reports that GAB had a positive influence on NVI. For example, section 8.2.3 reports that that a Canadian distributor approached Fertility with an interest in their products. Consequently, sections 8.3.2 and 8.4.2 explain that Fertility increased the value of this social capital by using DB and RTS that led the foreign distributor to invest in the business, which enabled NVI. Appendix 7E also reports a similar situation in HeartBeat and FemMed who used GAB as a mechanism to create highly valuable mentor social capital. Specifically, Table 8-14 summarises that HeartBeat and FemMed both used GAB, AB, and RTS as a combined process to enable NVI.

Interestingly, HeartBeat were the only firm to show a weakness in practicing GAB, as they agreed to form ties with an Indian VC syndicate despite their reluctance to source venture capital. Section 8.3.1 explains that HeartBeat were unsuccessful in securing venture capital, which delayed their commercialisation by six-months, and consequently inhibited their NVI. Since SafeMed did not have the opportunity to take advantage of GAB, this is another factor, which emphasises the firm's poor performance as few buyers or independent investors shown any interest in their existing technology or products. One possible interpretation of these findings is that engaging in GAB provides an initial indication that the focal actor owns or has access to strategically valuable resources and capabilities. Therefore, these findings indicate a central attribute of INVs capability to practice GAB, is having the foresight and intuition to collaborate with actors who can have a positive influence on their growth and development. Thus, within these contextual settings, the researcher assumes GAB is likely to enable NVI.

8.5.2 Network Extension Activities Influence on NVI

Table 8-15 reports why certain network extension activities enable or inhibit NVI. It is important to emphasise that Table 8-15 aggregates Appendix 8, which presents a more granular cross-case data analysis. To begin with, Table 8-15 reports that all of the four INVs used DB as a mechanism to extend their social capital. However, Table 8-13 reports that DB appears to have a varied influence on NVI. Incidentally, Table 8-15 indicates there is evidence that the INVs shown signs of stronger and weaker practices in terms of using DB to extend their social capital. Thus, the following sections indicate that these stronger and weaker practices give insight into why certain DB activities enable or inhibit NVI.

Firstly, Table 8-15 reports the way in which these INVs use DB to extend their social capital appears to differ across cases. For example, Appendix 8A reports that Fertility used DB to start building trust with a Chinese MNE with the long-term view of signing a distribution agreement to sell their products in mainland China. Sections 8.2.3 and 8.3.2 therefore describe that Fertility used GRB to form ties with this Chinese distributor and immediately entered the "trust building phase" which required a high commitment of human and financial resource to maintain regular contact with the MNE. Consequently, Table 8-15 report after a three-year period of DB, Fertility were successful in signing a foreign distribution agreement with this buyer who is one of China's largest MNEs. Thus, a likely interpretation of these findings is the initial use of GRB in combination with this continuous use of DB helped enable Fertility's NVI.

Table 8-15: Bonding Activities Influence on New Venture Internationalisation

	Fertility		**HeartBeat**		**FemMed**		**SafeMed**	
	Initial influence on NVI†	**Subsequent^ influence on NVI**	**Initial influence on NVI**	**Subsequent influence on NVI**	**Initial influence on NVI**	**Subsequent influence on NVI**	**Initial influence on NVI**	**Subsequent influence on NVI**
Dependency Bonding (DB)								
Stronger practises	**(+)** Uses DB to start building trust with Chinese MNE	**(▲+GRB)** Firm signs distribution agreement with Chinese MNE			(+) Uses DB to raise interest from foreign strategic buyer	**(▲+GRB)** Strategic buyer acquires firm, enabling NVI		
Weaker practices	**(-)** Uses DB with VC investor to secure seed capital	**(▼+ GRB)** VC does not invest which inhibits NVI	**(-)** Uses DB with VC investor due to secure seed capital	**(▼+ GAB)** Due diligence delays NVI by six months			(-) Uses DB to build trust with mentors and suppliers	**(▼+ GRB & GSB)** Mentors suppliers inhibit NVI
Impassive Bonding (IBG)								
Stronger practises			(□) No involvement in IBG which is a strength					
Weaker practices	**(-)** Used IBG with co-founder and BAS as entrepreneur lost interest in actors	**(▼+ LRB, DB & ET)** Ties delayed Chinese relations which inhibited NVI			(-) Engaged in IBG with distributor as they no longer sold products	**(▼+ GSB & ET)** US distributor delayed and inhibited NVI	(-) Engaged in IBG with foreign investors, buyers and suppliers	**(▼+ GSB)** This IBG led to elimination of ties which inhibited NVI
Affinity Bonding (AB)								
Stronger practises	**(+)** Used AB to build trust with mentors who introduced firm to "global contacts"	**(▲+LRB)** Mentors endorsement led to EU distribution agreement which enabled NVI	**(+)** Used AB to build trust with foreign mentor who helped with commercialisation	**(▲+GAB & RT)** Mentor promoted the firm's products globally, which enabled NVI	(□) Used AB with investors, mentors & suppliers which had no initial influence on NVI	**(▲+GAB & RT)** Mentors helped the firm establish a US sales subsidiary which enabled NVI		
Weaker practices							(□) No AB which is a weakness	

† This table is a summary of Appendix 8, which provides a more granular cross-case analysis.

^ "NVI" refers to NVI. In accordance with Zahra and George (2002), Jones and Coviello (2005) and Oviatt and McDougall (2005) the researcher analysed NVI with respect to: (1) inward/outward cross-border activities (i.e. R&D, production or sales), (2) speed (i.e. the length of time between foundation and foreign market entry) and scope (i.e. the (3) extent to which the new venture enters foreign markets outside its home region)

(+) refers to the initial benefits a specific networking activity had on NVI: while (-) refers to the initial problems a networking activity had on NVI

(▲) refers to networking activities that enabled NVI over the long-term: while (▼) refers to networking activities that inhibited NVI or the long term

(▲+…) indicates that a combination of networking enable NVI: **(▼+…)** indicates that a combination of networking activities inhibit NVI

"LRB" refers to local referral bridging; "GRB" refers to global referral bridging; "LSB" refers to local search bridging; "GSB" refers to global search bridging; "GAB" refers to global acceptance bridging; "ET" refers to eliminating ties; "PT" refers to prioritising ties; "RT" refers to reconfiguring ties

(□) refers to networking activities that appear to have no clear influence on NVI

Source: The Author

However, Table 8-15 indicates under certain contextual conditions, particularly in the case of buyer social capital, DB is a necessary and unavoidable activity. Nonetheless, there is evidence that the firms shown stronger and weaker practices in performing this networking activity. For example, Appendix 8A reports on SafeMed's DB with a foreign mentor who initially provided FDA consultancy, but as the relation evolved the firm continued to access the mentor's US network by using GRB to create buyer and supplier social capital. However, section 8.3.1 explains that SafeMed were over-reliant on this US mentor and placed too much trust in these referrals. Moreover, section 8.4.1 reports that this buyer and supplier social capital eventually became a liability to the firm, which indicates that SafeMed's DB inhibited their NVI. Given Table 8-15 reports cross-case evidence that all of the firms shown strengths and weaknesses in practicing this networking activity, the researcher assumes that DB can either enable or inhibit NVI. Thus, one possible interpretation is the ability to avoid an over-reliance on DB seems to be an important condition on whether this activity will either enable or inhibit NVI.

There is also strong evidence that IBG inhibits NVI. Firstly, Table 8-15 reports that three (Fertility, FemMed and SafeMed) of the four INVs implicitly used IBG in attempts to extend their social capital. In these cases, there is strong evidence that the use of IBG had a negative influence on each of these INV's initial and long-term development. For example, section 8.3.1 reports Fertility engaged in IBG with Dr Shi their co-founder and their local BAS, as in both cases, the firm became impassive about interacting with these actors. For example, Appendix 8B suggests, when Dr Shi exited the company, this had a negative impact on relations with the Chinese distributor, which inhibited NVI. Similarly, section 8.3.2 reports FemMed used IBG as they attempted to extend social capital with a US distributor. However, Appendix 8B reports that FemMed had a false sense of trust that the US distributor would sell their products. Nevertheless, section 8.4.2 reports that when FemMed's entrepreneur reflected on this experience, she admitted despite the initial resource they had invested in this tie, they did not interact with this distributor or encourage them to sell their products. Thus, a clear interpretation of these findings is that FemMed's IBG inhibited their NVI.

Interestingly, Appendix 8B reports that SafeMed were most intensive in using IBG with their investors, a US buyer, and multiple US suppliers. In three of these relations, Appendix 8B reports on section 8.5.1 discussion that SafeMed had initially used GSB to create social capital that quickly became a liability, which explains the firm's impassiveness. Thus, given SafeMed's retrenchment of these ties, it is apparent that IBG inhibited their NVI. Finally,

Table 8-15 reports that HeartBeat did not engage in IBG whilst attempting to extend their social capital. Instead, Figure 8-2 illustrates that HeartBeat were found to use AB as a lubricant to extend their social capital, which the below discussion reports in depth. Nevertheless, a likely interpretation of this finding is that HeartBeat was able to avoid IBG, which shows strength in being able to focus on other networking activities such as AB in order to extend their social capital. Therefore, based on these specific data, the researcher assumes that IBG is likely to inhibit NVI.

By contrast, there is strong evidence that AB enables NVI. That is, Table 8-15 reports that three (Fertility, HeartBeat and FemMed) of the four INVs used AB a lubricant to extend their social capital. In each of these cases, Appendix 8C reports that AB had a positive influence on the INVs initial and long-term development. For example, section 8.3.1 reports that Fertility's AB with two life science entrepreneurs – Harry and Angus – led to initial benefits such as access to business and emotional support. Table 8-15 reports that these mentors endorsement subsequently led Fertility to sign an EU distribution agreement, which enabled their NVI. Appendix 8C also reports a similar situation in both HeartBeat and FemMed who used AB as a mechanism to extend ties with their mentors. In both cases, these mentors were US-based surgeons who had a strong interest in each of the firms' technologies and existing products. Consequently, in both cases, Table 8-15 specifies that these US surgeons became KOLs for the firms within the US medical technology sector, which evidently enabled both of their NVI.

Interestingly, SafeMed are the only firm who did not engage in AB, which the researcher interprets as a weakness given the clear importance of this networking activity. Since SafeMed did not engage in AB, this indicates they could not connect on an intellectual or emphatic level with mentors, buyers, and suppliers who are involved in the life sciences industry. One possible interpretation of these findings is given that the majority of SafeMed's TMT's industry experience was within investment banking and commercial real estate, it is apparent the founders were unable to strike an inter-personal connection with actors within the medical technology sector. Therefore, these findings indicate a central attribute of an INV's capability to practice AB, is having the intellect and empathy to connect with actors in contextually specific industries. Thus, based on these contextual conditions, the researcher assumes that AB is likely to enable NVI.

8.5.3 Network Modification Activities Influence on NVI

Tables 8-16 and 8-17 report on why certain network modification activities enable or inhibit NVI. To begin with, Table 8-16 reports that all of the INVs used ETS as a mechanism to modify their social capital. Consequently, Table 8-13 reports that ETS appears to have a varied influence on NVI. Incidentally, Table 8-16 indicates there is evidence of stronger and weaker practice in terms of how these INVs perform this networking activity. These stronger and weaker practices therefore provide insight on why ETS enables or inhibits NVI. One important observation from Table 8-16 is the majority of INVs used ETS as a reactive mechanism to modify social capital that was having a negative impact on the firm. Whereas, Table 8-16 also reports that were some instances where INVs used ETS as a proactive activity to modify their social capital. In most cases, irrespective of whether this retrenchment of weak ties was a reactive or proactive action, there is strong evidence that once these INVs used ETS to modify their social capital, this activity would subsequently enable their NVI.

For example, Table 8-16 reports that FemMed used ETS as a reactive activity to modify their ties with a US distributor. Incidentally, section 8.4.2 explains the US distributor shown a lack of commitment and did not attempt to sell the firm's products. Therefore, this situation left the firm in a vulnerable position as they had forecasted to generate international sales revenues that did not materialise which initially had a negative impact on NVI. Consequently, Figure 8.6 illustrates that FemMed used ETS to prevent an additional decrease in the value of this buyer social capital, before it became a serious liability. However, Table 8-16 reports Fertility's use of ETS did bring a certain amount of serendipity as a Californian surgeon who was a customer of the US distributor approached the firm and "refused to accept he could no longer buy [FemMed's] products." Therefore, this decision to retrench this weak tie did trigger the firm to form a new R&D partnership with the Californian surgeon and establish a US sales subsidiary, which both enabled NVI.

Table 8-16: Eliminating Weak Ties

		Reason for change	Nature of change	Initial influence on NVI		Subsequent influence on NVI	
Eliminating ties – Evidence of stronger practices							
HeartBeat – US VC	Investor	VC shown lack of interest in the venture	Proactive	Retrenched the relation early to prevent additional costs	Positive	Firm targeted universities to generate international sales	Enabler
FemMed – French manufacturer	Supplier	Quality problems with product along with collaboration difficulties due to foreign location	Proactive	Searched for new manufacturer who had stronger production capabilities	Positive	Firm built long term strategic alliance with a local Scottish manufacturer who had superior production capabilities	Enabler
Fertility – EU licensor	Buyer	EU licensor had lost interest in firm's technology	Proactive	This relationship delayed the generation of international revenues	Negative	Retrenchment triggered the firm to focus on its core product range which enabled indirect and direct exporting	Enabler
Eliminating ties – Evidence of weaker practices							
Fertility – English manufacturer	Supplier	Loss of trust in the firm's production capabilities due to ongoing quality issues	Reactive	Firm did not have suitable product to export	Negative	The retirement of this tie triggered the decision to internalise production	Enabler
FemMed – US distributor	Buyer	US distributor shown lack of commitment and did not generate international sales	Reactive	Firm was left in a vulnerable position as they anticipated sales revenues which did not materialise	Negative	Retirement triggered firm to conduct new R&D in partnership with Californian surgeon and the decision to establish US sales subsidiary	Enabler
Fertility – Dr Shi	Mentor	Co-founder felt uncomfortable with commercial aspect of the venture	Reactive	Firm had lost a core R&D partner with influence in China	Negative	The retirement of this tie triggered the decision to reconfigure the TMT	Enabler
SafeMed – R&D consultants	Supplier	R&D consultants did not deliver a quality service	Reactive	Retrenched ties after it became a liability	Negative	Retrenchment motivated firm to internalise R&D which helped over growth challenges	Enabler
SafeMed – Local gov. advisor	Mentor	Firm lost interest in seeking advisors help	Proactive	Firm found itself unable to apply for government innovation grants	Negative	The firm's IPO meant they were no longer eligible for start-up government grants	Inhibitor
Fertility – Canadian VC	Investor	Canadian VC no longer wanted to invest	Reactive	Retrenched ties after it became a liability	Negative	This due diligence process delayed the firm's commercialisation by six-months	Inhibitor
HeartBeat – Indian VC	Investor	Indian VC no longer wanted to invest	Reactive	Retrenched ties after it became a liability	Negative	This due diligence process delayed the firm's commercialisation by six months	Inhibitor

Source: The Author

By contrast, Table 8-16 reports that Fertility used ETS as a proactive activity to modify their ties with an EU licensor. Section 8.4.2 explains that this EU licensor had lost interest in Fertility's technology due to the emergence of similar technologies. Figure 8-6 illustrates that Fertility used ETS to retrench these ties before this social capital became a liability. Moreover, Figure 8-6 also illustrates that Fertility retrenched this tie with the EU licensor much earlier than FemMed's attempt, which indicates a more proactive attempt to modify buyer social capital. Consequently, this decision to retrench this weak tie also triggered the firm to focus on building a core product range, which encouraged the firm to use indirect and direct exporting as a new internationalisation strategy, which enabled NVI. One possible interpretation of these findings is that Fertility shown a greater strength in practicing ETS in comparison to FemMed, as Fertility's decision to retrench these ties was more proactive in nature. Nevertheless, these findings do provide strong evidence that ETS with buyers did enable these firms' NVI.

However, Table 8-16 also provides mixed results on whether INVs use of ETS with investors enables or inhibits NVI. For example, section 8.4.1 specifies that both Fertility and HeartBeat used ETS to modify their investor social capital with Canadian and Indian VC syndicates. Nevertheless, Table 8-16 reports that both firms initially used ETS as a reactive activity to modify this investor social capital. Consequently, Figure 8.4 illustrates that both firms were slow in their use of ETS, which indicates this social capital had become a liability as this due diligence delayed the firms' commercialisation by six-months and initially had a negative influence on NVI. Table 8-16 thus, reports in both cases, given the slow response to use ETS, the weak use of ETS subsequently inhibited NVI as it put a long-term strain on both businesses. However, section 8.4.1 does specify that HeartBeat had learned from these previous mistakes, and used ETS much earlier to modify its social capital with a US VC syndicate. In this event, Table 8-16 reports HeartBeat used ETS as a proactive activity to modify their weak ties with these investors, which prevented this social capital from becoming a liability. Consequently, Table 8-16 reports that since the firm changed its strategy and exported its products to universities, it is evident that ETS subsequently enabled NVI.

Similarly, Table 8-16 reports there were stronger and weaker attempts at using ETS to modify supplier social capital, but in all cases, these attempts appear to enable NVI. For example, Table 8-16 reports that FemMed used ETS as a proactive activity to modify their ties with a French manufacturer. Section 8.4.2 explains that FemMed decided to retrench

this weak tie, as there was on-going quality problems since the firm found it difficult to collaborate with this supplier across borders. Consequently, Figure 8-6 also illustrates that FemMed were early to use ETS before this social capital became a liability. Therefore, Table 8-16 reports that this proactive use of ETS encouraged the firm to use LSB to create social capital with a local Scottish manufacturer, who had superior production capabilities, and subsequently enabled their NVI.

By contrast, Table 8-16 reports that Fertility and SafeMed both used ETS, but as a reactive activity to modify their supplier social capital. For example, Figure 8-6 illustrates that both Fertility and SafeMed were slow to retrench these weak ties, which led to a greater loss in social capital. For instance, section 8.4.2 reports that Fertility had lost trust in their manufacturers production capabilities due to ongoing quality issues, while SafeMed had lost trust in their Chinese and American R&D consultants who did not deliver on their contractual obligations. Nevertheless, Table 8-16 does indicate this use of ETS did encourage both Fertility and SafeMed to internalise R&D and/or production, which over the long-term enabled their NVI.

Interestingly, both firms used ETS to modify their mentor social capital. However, Table 8-16 reports both firms differ on whether they were proactive or reactive in modifying this social capital. For example, Fertility used ETS as a reactive activity to retrench ties with Dr Shi the firm's co-founder, while SafeMed were proactive in using ETS to retrench ties with a local government advisor. Interestingly, Figure 8-5 illustrates that Fertility were slow to retrench this social capital, which meant the firm had lost a core R&D partner and influence in China. Nevertheless, Table 8-16 reports that Fertility's use of ETS did encourage the firm to recruit a more internationally experienced TMT, which subsequently enabled NVI. By contrast, Figure 8-5 illustrates that SafeMed were fast to retrench ties with a local government advisor as they focused on an IPO, but Table 8-16 reports this use of ETS meant the firm were unable to apply for government innovation grants. Consequently, there is strong evidence that the firm were unable to secure future government grants, which over the long-term inhibited NVI.

Table 8-17: Prioritising and Reconfiguring Strong Ties

	Tie type	Reason for change	Nature of change	Initial influence on NVI		Subsequent influence on NVI	
Prioritising ties							
Fertility – Adam	Mentor	Entrepreneur felt the mentor was no longer a priority	Reactive	Adam referred the entrepreneur to an EU licensor and Canadian VC who both delayed NVI	Negative	Retrenchment triggered decision to focus on indirect exporting opposed licensing	Enabler
Fertility – George	Mentor	Entrepreneur felt the mentor was no longer important in the business	Proactive	None	Neutral	Retrenchment provided the entrepreneur with opportunity to build new sales & marketing relations	Enabler
Fertility – Sean	Mentor	Entrepreneur felt the mentor was no longer important in the business	Proactive	None	Neutral	Retrenchment provided the entrepreneur with opportunity to build new sales & marketing relations	Enabler
HeartBeat – Local manufacturer	Supplier	Local manufacturer didn't have FDA regulatory approval or suitable production capabilities	Proactive	Maintained link, but reallocated time to sourcing cross-border production relationships	Positive	Retrenchment meant the entrepreneur signed an overseas production and distribution agreement with HK manufacturer	Enabler
Reconfiguring ties							
Fertility – Canadian distributor	Buyer	Entrepreneur encouraged distributor to invest in the firm's NPD	Proactive	Signed Canadian distribution agreement and distributor agreed to fund regulatory approval	Positive	Redeployment meant Canadian distributor helped the fund the expansion of its domestic production facility, which enabled greater exporting	Enabler
HeartBeat – US cardiologist	Mentor	Entrepreneur wanted to involve the US cardiologist more in the business	Proactive	Founded 50/50 IJV with US cardiologist in USA	Positive	Redeployment triggered US cardiologist to encourage HK manufacturer to sign production & distribution agreement	Enabler
HeartBeat – Universities	Mentor	Entrepreneur identified universities as core customer to generate international sales	Proactive	North American and European universities became the firm's core customer	Positive	Redeployment meant academics began to promote entrepreneur's products, which encouraged a surge in international sales	Enabler
HeartBeat – HK manufacturer	Supplier	Entrepreneur encouraged HK manufacturer to distribute his products	Proactive	Signed outward distribution agreement	Positive	Redeployment meant new distribution agreement enabled growth in international sales for the business	Enabler
FemMed – BAS	Investor	Firm began to build an inter-personal relation with BAS	Reactive	BAS encouraged firm to source a strategic buyer to acquire the company	Positive	Redeployment lead to angels becoming "friends to us all" following a successful trade sale	Enabler
FemMed – Californian surgeon	Mentor	Surgeon offered have more involvement in the business	Reactive	Surgeon became a key opinion leader for US sales subsidiary	Positive	Redeployment led preceptor surgeon to have more involvement which led to growth in international sales	Enabler

Source: The Author

Interestingly, there is also evidence that PTS enables NVI. That is, Table 8-17 reports that Fertility and HeartBeat predominately used PTS a proactive activity to modify their strong ties with mentors and suppliers. For example, section 8.4.1 reports that Fertility used PTS to modify its mentor social capital as they felt certain mentors were no longer important in the firm's international development. Incidentally, this use of PTS is in direct contrast to the above discussion on SafeMed use of ETS to modify their mentor social capital. Incidentally, Table 8-17 reports this use of PTS initially had a neutral influence on NVI as the firm maintained contact with these strong ties, but reallocated their limited resources to other relations. Consequently, Figure 8-6 illustrates that Fertility were early to use PTS which meant this social capital maintained a reasonable level of value. Moreover, Table 8-17 reports this proactive use of PTS motivated the firm to create new sales and marketing contacts, whose industry experience subsequently helped enable NVI.

Interestingly, HeartBeat were the only the firm to use PTS as a mechanism to modify supplier social capital. That is, section 8.3.2 reports that HeartBeat were unique in building an inter-personal relation with their local supplier. However, Table 8-17 reports that this local manufacturer did not have the sufficient production capabilities or US FDA regulatory approval to manufacture the firm's products. Therefore, section 8.4.2 describes that HeartBeat maintained these ties, but relocated their resources to building ties with a Hong Kong manufacturer who had more extensive production capabilities. Consequently, Table 8-17 reports HeartBeat's proactive use of PTS was a trigger to modifying this new social capital, as the Hong Kong manufacturer agreed to distribute the firm's products, which subsequently enabled NVI. Therefore, based on these specific data, the researcher assumes that PTS is likely to enable NVI.

There is also strong evidence that RTS enables NVI. That is, Table 8-17 reports that three (Fertility, HeartBeat and FemMed) of the four INVs used RTS as mechanism to modify their social capital. Moreover, Table 8-17 indicates that Fertility and HeartBeat were both proactive in using RTS to modify their social capital, while FemMed appear to be reactive in the use of RTS to modify their social capital. Additionally, section 8.4.1 explains that both HeartBeat and FemMed used RTS to modify their mentor social capital, as they wanted to redeploy their mentors' involvement within the business. That is, section 8.4.1 explains that both HeartBeat and FemMed redeployed their strong ties with US surgeons as they encouraged them to become KOLs within the business. Incidentally, Table 8-17 reports that for both firms this use of RTS had a positive influence on NVI as these intellectual

connections helped with their US expansion. Consequently, Table 8-17 also reports that this proactive use of RTS helped HeartBeat accelerate the development of Hong Kong manufacturer relation, while helped FemMed increase US sales and secure a trade-sale, which indicates this activity subsequently enabled NVI.

Table 8-17 also reports that these three firms used RTS, which increased the multiplexity of their investor and buyer social capital. That is, section 8.4.1 reports that HeartBeat were early to use RTS in order to increase the multiplexity of their relations with universities. For example, section 8.4.1 specifies that HeartBeat initially formed mentor ties with universities but redeployed these relations, and encouraged these ties to become a core customer. Consequently, Table 8-17 reports that this redeployment meant academic institutions began to promote HeartBeat's products that led to a surge in international sales, which enabled NVI. Similarly, section 8.4.2 also reports that Fertility were early to use RTS in order to redeploy their relations with a Canadian distributor. That is, Table 8-17 reports that Fertility encouraged the distributor to invest in the firm's NPD and regulatory approval. Consequently, this redeployment meant the Canadian distributor helped fund the expansion of Fertility's domestic production facility, which increased the level of direct exports and enabled NVI.

Finally, Table 8-17 reports that FemMed used RTS to modify their strong ties with Harmony a local BAS, as the firm built an inter-personal relation with this investor. This inter-personal tie then encouraged the BAS to invest additional financial capital into the business, despite their initial inability to generate international sales. Consequently, Table 8-17 reports that this friendship meant the firm received extensive mentoring in terms of business and emotional support that helped with the foundation of a US sales subsidiary, which evidently enabled NVI. Interestingly, SafeMed were the only firm who did not engage in RTS, which the researcher also interprets as a weakness given the clear importance of this networking activity. Therefore, these findings indicate RTS is a central activity, as redeployment appears to be crucial practice for resource constrained innovation based firms. Thus, based on these contextual conditions, the researcher assumes that RTS is likely to enable NVI.

8.6 RQ5: Which network processes underpin networking capability development in new venture internationalisation?

This section reports the cross-case findings on which network processes underpin networking capability development in NVI. Firstly, Figure 6-8 illustrates that three network

processes emerged as overarching dimensions that aggregate several second-order themes. Thus, these aggregate categories are the (1) network-enhancing process, (2) network-delaying process, and (3) network-modifying process. Consequently, these various networking activities (e.g. second-order themes) undergird these three network processes (e.g. aggregate categories), which were found to conceptually underpin an INV's networking capability. Figures 8-8, 8-9, 8-10, and 8-11 therefore illustrate the development of networking capability in NVI. Table 8-18 also presents a summary of these cross-case findings, which the following sections will now explain in depth.

Table 8-18: Networking Capability Development: Summary of Findings

	Fertility		**HeartBeat**		**FemMed**		**SafeMed**	
	Initialˆ	**Subsq†**	**Initial**	**Subsq**	**Initial**	**Subsq**	**Initial**	**Subsq**
Local referral bridging	Weak	Strong	Strong	Strong	-	-	Weak	Weak
Global referral bridging	Weak	Strong	Strong	Strong	Strong	Strong	Weak	Weak
Local search bridging	-	-	Strong	-	Strong	Strong	Strong	-
Global search bridging	-	-	-	-	Weak	Weak	Weak	Weak
Global acceptance bridging	Weak	Strong	Strong	Strong	Strong	Strong	Weak	Weak
Affinity bonding	Weak	Strong	Strong	Strong	Strong	Strong	Weak	Weak
Dependency bonding (avoiding)	Weak	Strong	Weak	Strong	Weak	Strong	Weak	Weak
Impassive bonding (avoiding)	-	-	-	-	Weak	Strong	Weak	Weak
Eliminating ties	Weak	Weak	Strong	Weak	Weak	Strong	Weak	Weak
Reducing ties	Weak	-	-	-	-	-	-	-
Prioritising ties	Weak	Strong	Strong	-	-	-	-	-
Reconfiguring ties	Weak	Strong	Strong	Strong	Strong	Strong	-	-

ˆ "Initial" refers to initial evidence of a specific networking activity.

† "Subsq" is shorthand for subsequent and refers to subsequent evidence that indicates this networking activity was used to bridge, bond, or change the content of a new tie.

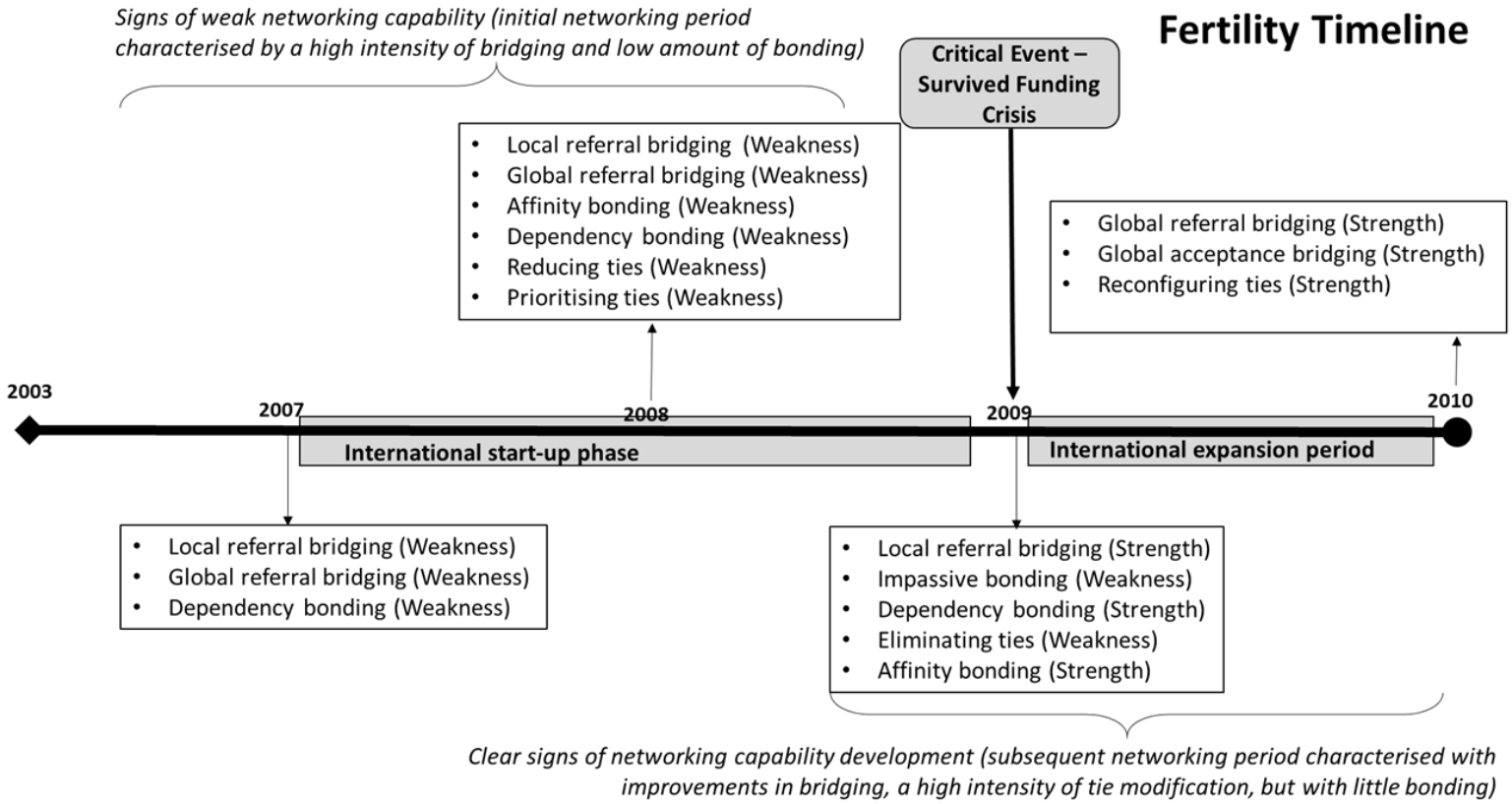
"Weak" practices refers to when the firm performs a networking activity on more than two occasions, which ultimately inhibited NVI.

"Strong" practices refers to when the firm performs a networking activity on more than two occasions, which ultimately enabled NVI.

"-"refers to when there was no evidence of the firm performing this specific networking activity.

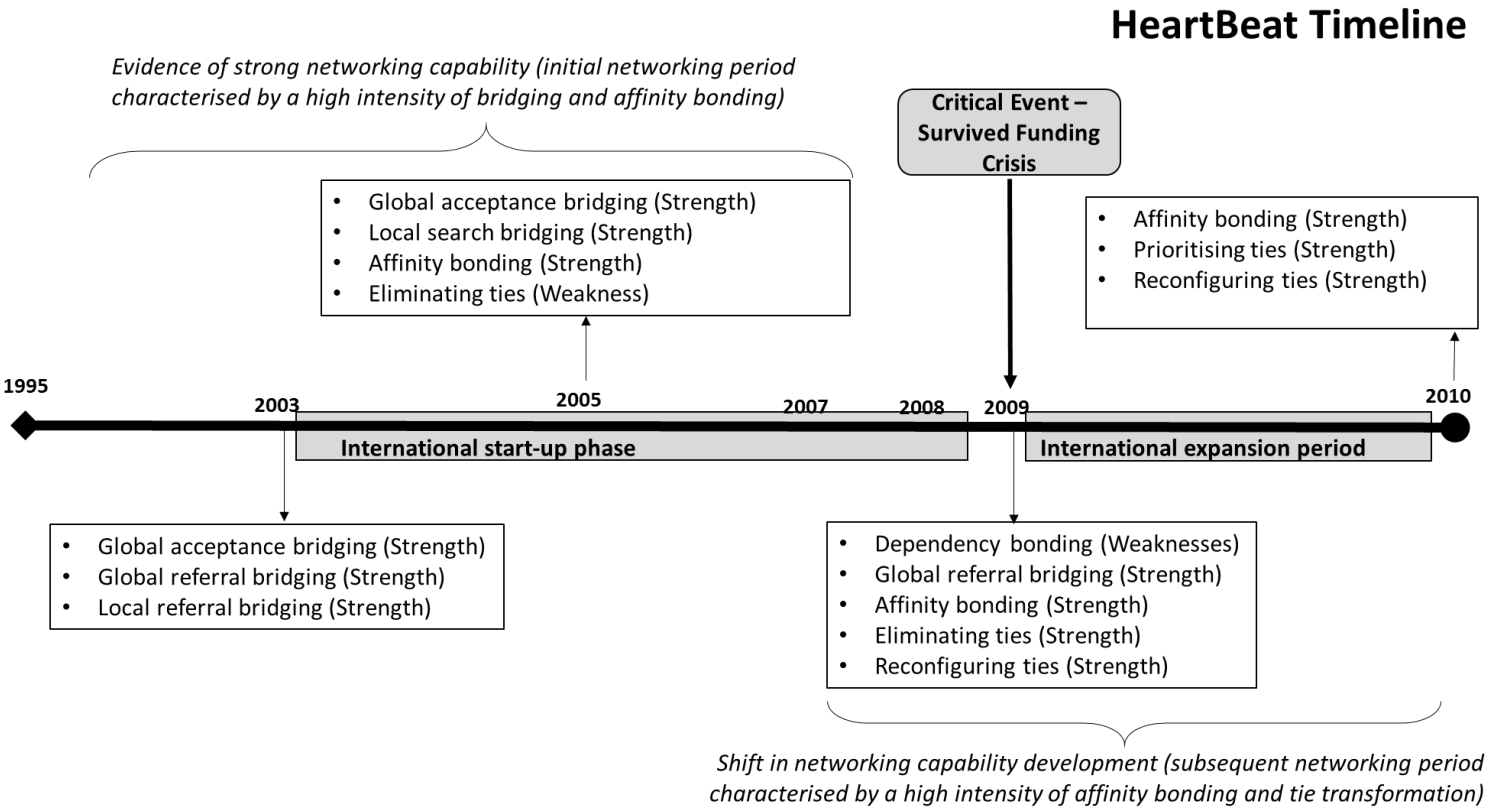
Source: The Author

Figure 8-8: Fertility – Networking Capability Development



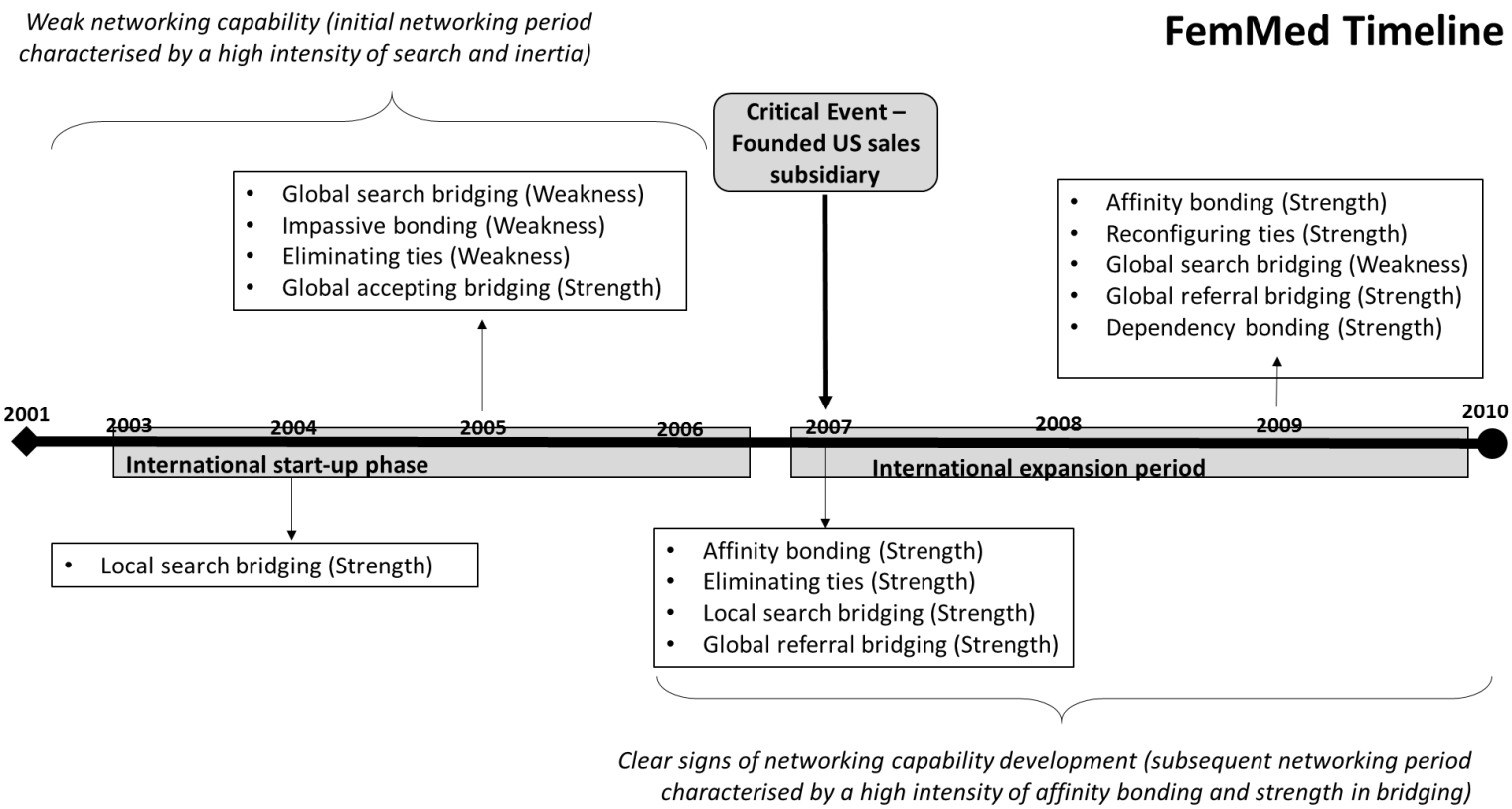
Source: The Author

Figure 8-9: HeartBeat – Networking Capability Development



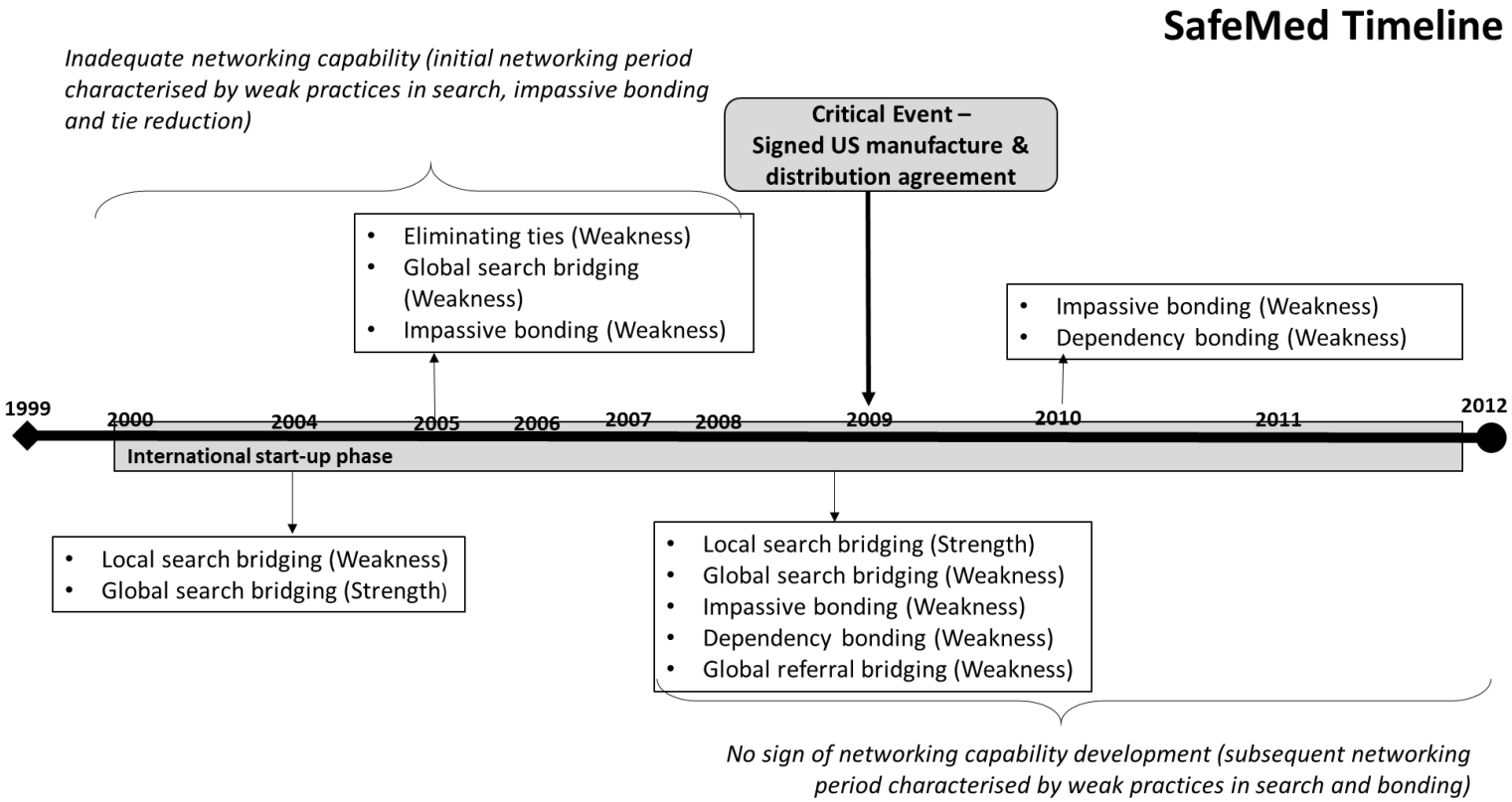
Source: The Author

Figure 8-10: FemMed – Networking Capability Development



Source: The Author

Figure 8-11: SafeMed – Networking Capability Development



Source: The Author

8.6.1 Network-Enhancing Process

Tables 8-19 and 8-20 report the various networking activities that underpin the network-enhancing process. Firstly, section 8.5.2 reports that within knowledge-intensive industries such as the medical technology sector, there is strong evidence that AB enables NVI. Section 8.5.1 reports the strength of the INV's capability to practice network creation activities has a varied influence on NVI. Therefore, this section reports on evidence that indicates the use of stronger practices to perform network creation activities in combination with AB leads to what the researcher terms as a "network-enhancing process." The researcher defines the *network-enhancing process*, as *when the focal actor engages in networking activities that "enhances" the value of its social capital*. Furthermore, the conceptual aggregation of these abductive findings is that this network-enhancing process is integral to the development of networking capability in NVI. It is also evident from this cross-case analysis that three (Fertility, HeartBeat and FemMed) of the four INVs show clear signs of using the network-enhancing process to enable NVI.

Table 8-19 indicates that Fertility's combined use of LRB and AB is one example of the network-enhancing process. That is, Figure 8-8 illustrates that Fertility at the international start-up phase were initially weak in their networking capability to create or extend social capital. Section 8.5.1 reports after Fertility used LRB to create ties with various local mentors, they struggled to maintain the value of this social capital. Incidentally, Appendix 7A reports Fertility had become too reliant on LRB since local mentors such as Adam at UniNet inhibited their NVI. Moreover, section 8.5.2 also reports that Fertility initially shown a weakness in practicing AB as the entrepreneur struggled to build inter-personal relations with mentors. Nevertheless, Figure 8-8 illustrates as Fertility moved into the international expansion phase, they began to show signs of networking capability development as they turned this weakness of practicing LRB into a strength. That is, Table 8-14 reports that Fertility used LRB to create ties with two local mentors (e.g. Harry and Angus) who were instrumental in their NVI. This is evident in quotation NEP1 within Table 8-19, which emphasises their combined use of LRB and AB was apparent as these mentors "were happy to hear from you" and would "provide support every week." Consequently, Tables 8-14 and 8-15 confirm that Fertility's use of LRB and AB led to an increase in the value of their mentor social capital as they helped the firm sign an EU distribution agreement, which enabled NVI.

Table 8-19: Representative Data for Network-Enhancing Process

	Affinity bonding	Aggregate category 1 – Network-enhancing process
Local referral bridging	**Fertility –** Firm shown initial weakness in using LRB to create mentor social capital, but after using AB to extend this social capital, this enabled NVI	**NEP1** Guys like that give you support every week. You can talk to them and they're just happy to hear from you and it's that encouragement that, you know, and you can bounce things off. So, it's having that involvement. I'd say he's definitely one [FER-I09-B].
	HeartBeat – Firm shown initial strength in using LRB and AB to create and extend their mentor social capital, which enabled NVI.	**NEP2** [Debbie] is the coordinator for the [Local] government. She is very nice and I regularly meet with her, she is like a friend to me. I actually had a meeting with her this morning and she has been fantastic in helping us secure R&D grants and promote our products internationally at tradeshows [HEA-I09-B].
Global referral bridging	**HeartBeat –** Firm shown strength in using GRB and AB to create mentor social capital with US hospitals, which enabled NVI	**NEP3** I do have an advisor/friend/mentor in the US who's a cardiologist, but he's a kind of a serial entrepreneur himself. So [Dr Arthur] is our medical advisor chum… and he's the guy who helped us enter the US market by introducing us to the hospitals. You know, I think the US market in particular is such a strange beast to us in Australia that you really need to have people on the ground there who can provide you with that advice [HEA-I09-D].
Local search bridging	**FemMed –** Firm shown strength in using LSB to search for new contacts such as investors and suppliers and building inter-personal relations with them to enable NVI	**NEP4** We looked at VCs and we looked at Angels [BAS], and we felt that we would have more control over the business and there was more support from an Angel company than a VC. Because the thing about a VC is if you don't hit the milestones, they essentially come in, run the company and mothball you if they think it wasn't working. We felt with an Angel that they would let us, maybe not free-rain as such, but there would be more support than just finance [FER-I11-B3].
Global acceptance bridging	**HeartBeat –** Firm shown strength in using GAB and AB as a mechanism to increase the value of their mentor social capital, which enabled NVI	**NEP5** I have known him for fifth-teen years through my previous company. He had another company called [HeartCritical] and we just met at a tradeshow. And I have just kept in contact. His company – [HeartCritical] – got bought by a [large US MNE], and he became the chief cardiologist in [the MNE], but he is an entrepreneur so he stayed there for two or three years. And then he left and we started inventing this new device, but I have always kept in touch with him. Every time I go to the States, I always go and see him, as he is a friend of mine [HEA-I10-A].
	FemMed – Firm shown strength in using GAB and AB as a mechanism to increase the value of their mentor social capital, which enabled NVI	**NEP6** Probably the biggest benefit was we found a fantastic surgeon in California who used our products, so when the distribution agreement came to a halt, or ceased, the Californian surgeon was such a believer in [FemMed's] products that he refused to accept that he couldn't get the product anymore and he insisted that we sold the products to him [FEM-I11-B2].

Source: The Author

By contrast, Table 8-18 reports that HeartBeat shown a greater strength in using LRB and AB as a network-enhancing process. That is, Figure 8-9 illustrates that HeartBeat at the international start-up phase initially shown evidence of strong networking capability as they had the capacity to create and extend their mentor social capital. For example, section 8.5.1 reports that after HeartBeat used to LRB to create ties with a local government advisor (e.g. Debbie) it is apparent the entrepreneur struck an instant connection with this mentor. Incidentally, quotation NEP2 within Table 8-19 emphasises that the entrepreneur mentions that Debbie is "very nice" that "he regularly meets with her" and describes her as "like a friend to me." Figure 8-9 also illustrates that as HeartBeat moved into the international expansion phase there was a shift in their networking capability development as this period was characterised with less bridging and more AB with mentors. Consequently, Tables 8-14

and 8-15 confirm that HeartBeat's use of LRB and AB helped increase the value of mentor social capital, as this networking-enhancing process enabled the firm secure R&D grants, PCT applications and US FDA regulatory approval, which together enabled NVI.

Interestingly, Table 8-19 reports that HeartBeat were the only firm to use GRB and AB as a network-enhancing process. That is, Figure 8-1 illustrates that most of the INVs used GRB to create social capital with foreign buyers and suppliers. Whereas, HeartBeat were the only INV to use GRB as a mechanism to create mentor social capital and then use AB to extend this social capital. For example, section 8.2.2 describes that HeartBeat used GRB and AB to ask a US cardiologist (e.g. Dr Arthur) to introduce them to a US hospital who chaired a global R&D consortium. That is, quotation NEP3 in Table 8-19 describes Dr Arthur as an "advisor/friend/mentor" who had helped them "enter the US market by introducing [them] to US hospitals." Figure 8-9 also illustrates that HeartBeat continued to use GRB and AB, which indicates the increasing strength of their networking capability as they progressed to the international expansion phase. Consequently, Appendix 7B and 8C both confirm that HeartBeat's use of GRB and AB led to an increase in mentor social capital, as this network-enhancing process helped the firm gain access to a global R&D consortium that provided reputational benefits within the academic community, which were vital for enabling NVI.

Similarly, Table 8-19 reports that FemMed were the only firm to use LSB and AB as a network-enhancing process. That is, Figure 8-1 illustrates that most INVs used LSB to create social capital with mentors and suppliers, however Figure 8-2 illustrates that most of these INVs did not bond with these mentors or suppliers. Whereas, FemMed were the only INV within this sample to use LSB and AB to create and extend their investor social capital. For example, quotation NEP4 within Table 8-19 describes that FemMed: "looked at VC's and we looked at Angles [BAS], and we felt that we would have more control over the business and there was more support from an Angel company than a VC." Figure 8-10 also illustrates that FemMed shown strength in using LSB as they were successful in their selection of a strategically valuable partner, but it is also evident they only began to use AB once the firm reached the international expansion phase. Consequently, Tables 8-14 and 8-15 confirm that Fertility's use of LSB and AB led to an increase in investor social capital, as this network-enhancing process helped the firm establish a US sales subsidiary, which enabled NVI.

Interestingly, Table 8-19 reports that HeartBeat and FemMed were the only firms to use GAB and AB as a network-enhancing process. This is an important observation as although

these cross-case findings cannot be generalised, there was strong evidence in each of these cases that GAB and AB is a network-enhancing process that accelerates relationship development, which consequently enables NVI. That is, Table 8-19 reports that both HeartBeat and FemMed shown a strength in using GAB and AB to quickly create and extend their mentor social capital. For example, section 8.2.2 describes that HeartBeat initially used GAB to form ties with Dr Arthur a US cardiologist as they struck an instant connection due to their shared interest in telemedicine. That is, quotation NEP5 within Table 8-19 describes that HeartBeat's entrepreneur "met [Dr Arthur] at a tradeshow" about fifth-teen years ago and "just kept in contact" as Dr Arthur was as a "friend" who helped HeartBeat with "inventing a new [medical] device." Consequently, as section 8.6.3 describes, this network-enhancing process led to Dr Arthur becoming a KOL for the business whose endorsement provided reputational benefits within the US medical community, which enabled NVI.

Table 8-19 also reports that FemMed used GAB and AB as a network-enhancing process to increase the value of their mentor social capital. That is, quotation NEP6 within Table 8-19 describes "probably the biggest benefit [from this process] was we found a fantastic surgeon in California who used our products", then describes that "he was such a believer in [FemMed's] products that he refused to accept that he couldn't get the product anymore and he insisted that we sold the products to him." Similarly, section 8.6.3 describes this network-enhancing process meant the Californian surgeon also became a KOL for the business, whose endorsement had reputational benefits within the US medical community, which enabled NVI. These findings then indicate that GAB and AB is a network-enhancing process that supports the development of networking capability in NVI.

Table 8-20: Representative Data for Network-Enhancing and Delaying Process

	Dependency bonding	Representative Quote
Aggregate category 1 – Network-enhancing process		
Global referral bridging	**Fertility –** Firm shown strength in using existing network to create and extend social capital with a Chinese MNE which enabled NVI	**NEP7** They [Chinese distributor] haven't hindered us at all, they have supported us through this period. I think it is us who has hindered them, because of our manufacturing problems for the last nine-twelve months, those delays have cost them, you know they have hired people just to help us, not us personally, but helping get our products through and it's been a let-down for them [FER-I11-B].
	FemMed – Firm shown strength un using professional network to create and extend social capital with a strategic buyer which enabled NVI	**NEP8** Essentially, five people from [StarBuy] came over to the [FemMed] UK office, and also to our manufacturing/subcontractor site and poured over every single document that I think we have ever produced. I think they had a checklist obviously that went into financial, legal, IP, regulation, quality, manufacturing. They asked for a list of documents as evidence of what we done and it was just a week of us pulling out the documents, them going through it and just ticking boxes. They were very professional and we did everything to keep them happy [FEM-I11-B1].
Global acceptance bridging	**Fertility - Firm** began to show strength in attracting foreign customers and bonding with these customers to enable NVI	**NEP9** The Canadians got in contact with us and I signed a contract with them about six months ago, with the plan that they would register the product into Canada. They called us up and said look boys we're pretty happy with this idea, where are we this, we have pitched your product to a [a large Canadian pharmacy chain], and they liked it so much they wanted it. So that situation was a big ball opportunity, where we had to rededicate, rearrange resources to ensure we didn't drop that ball [FER-I11-A].
Aggregate category 2 – Network-delaying process		
Local referral bridging	**Fertility** – Firm shown weakness in relying too heavily on the advice of local mentors, whose referrals inhibited NVI	N**DP1** Well, [Adam] directed me to all that stuff. Once we'd met [Harry] and [Adam], everything kind of came through them. I mean, I've got hundreds more contacts from the two of them. And a lot of that is just company stuff [FER-I09-B1].
Global referral bridging	**Fertility –** Firm shown weakness in determining which investor referrals where of most benefit and became over-reliant on an VC investor tie	**NDP2** Well, we were completely dependent on them [VC]. We didn't have any back-up alternatives and we were out of money [FER-I09-A].
Global search bridging	**SafeMed –** Firm shown weakness in being able to determine which foreign buyer referral was most beneficial and they became over-reliant on this recommendation	**NDP3** Well, probably we should have been a little bit more aware of who we were actually dealing with. We should have got to a higher level and we always contemplated that. I was always dealing with the guy who said he was in charge, but I don't think he really was. So the lesson there is to always find out who are the decision makers, the real decision makers. And I contemplated going right to the CEO who is based in the UK actually and I also tried to get our chairman to ring him, but he wimped out [SAF-I10-B].
	SafeMed – Firm shown weakness in being unable to search for a suitable mentor they had found through a global search which eventually inhibited NVI	**NDP4** I met the [FDA guy] at end of a US trip and that was kind off the beginning of the relationship. He said forget the big guys, they are never going to get it out in the marketplace for you, stick with me because I have a team of independent sales guys that can actually make this happen for you, because the big guys are not going to help you. So I came back from that trip thinking he is probably on the right track and we developed it from there [SAF-I10-B]
Global acceptance bridging	**HeartBeat -** Firm shown weakness in ignoring the prospect of venture capital and became over-reliant on a potential VC investment	**NDP5** I think a lot of companies find when trying to deal with potential [VC] investors, that they can hold you back a lot. I think in general the whole venture capital industry, there's a lot of what I call… there's a lot of parasites out there and people running around pretending they've got money; they haven't got money, they're not serious [HEA-I09-D].

Source: The Author

Interestingly, Table 8-20 reports that in some cases, the INVs used DB as part of the network-enhancing process. That is, Table 8-20 reports that Fertility and FemMed both shown a strength in using GRB and DB as a network-enhancing process to increase the value of their buyer social capital. For example, sections 8.2.3 and 8.3.2 describe that Fertility used this

network-enhancing process to create and extend ties with a Chinese distributor. Quotation NEP7 within Table 8-20 also describes that Fertility's Chinese distributor "hadn't hindered [them] at all," but the entrepreneur argues that they "had hindered them, because of our manufacturing problems." One possible interpretation of these findings is that DB was a necessary activity in this network-enhancing process if they were to secure a distribution agreement with one of China's largest MNEs. Similarly, Table 8-20 also specifies that FemMed used this network-enhancing process to create and extend ties with StarBuy a foreign strategic buyer. That is, quotation NEP8 within Table 8-20 describes that FemMed engaged in a due diligence process with StarBuy officials which meant they "poured over every single document that I think we have ever produced." FemMed's entrepreneur then describes them as a "very professional and [they] did everything to keep them happy."

One interpretation of these findings is due diligence is one practice that underpins the DB activity, as the candidate under investigation is likely to be reliant on this outcome. Section 8.6.2 also describes there is strong evidence that the majority of the INVs shown a weakness in participating in a strategic buyers due diligence, which indicates that DB practice can also be a network-delaying process that inhibits NVI. However, Figure 8-10 illustrates as FemMed moved into the international expansion phase, they began to develop networking capability as they increased their capacity to extend this social capital. For example, section 8.3.2 explains FemMed's initial due diligence with a strategic buyer inhibited their NVI, but after this experience, the firm hired an M&A specialist and used GRB to create then extend ties with a new strategic buyer. Thus, this use of GRB and DB was a network-enhancing process that enabled their NVI. Interestingly, Figure 8-8 illustrates that Fertility began to develop their networking capability as they used DB and GAB as a network-enhancing process to create and extend ties with a foreign customer. That is, Fertility's entrepreneur describes the Canadian distributor as a "big ball opportunity, where we had to rededicate, rearrange resources to ensure we didn't drop that ball." This reallocation of resources indicates this combined use of DB and GAB was a network-enhancing process that enabled NVI. Therefore, these findings provide evidence that this network-enhancing process enabled networking capability development in NVI.

8.6.2 Network-Delaying Process

The researcher found evidence that a central process which underpins networking capability development, is the *network-delaying process*, which is when the focal actor engages in

networking activities that "delays" their NVI. Tables 8-20 and 8-21 report the various networking activities that underpin the network-delaying process. Firstly, and in contrast to section 8.6.1, there is strong evidence that DB also inhibits NVI. This section reports that once INVs engage in DB, there is evidence that this dependency can evolve into "impassiveness" or some cases denial about the current state or future value of asset-specific social capital. Therefore, this section reports on evidence that indicates the use of DB and/or IBG in combination with various network creation activities leads to what the researcher terms as a "network-delaying process." Nevertheless, the conceptual aggregation of these abductive findings is that this network-delaying process is somewhat conducive to the development of networking capability in NVI. That is, section 2.3 and 5.3 adopts Helfat et al. (2007) view that dynamic capabilities central purpose is for firms to overcome or avoid inertia by modifying their resource base. Therefore, there is evidence from the cross-case analysis that this network-delaying process *triggers* networking capability development, as the firm will ideally deploy this capability to modify its social capital before it becomes a liability.

Consequently, this cross-case analysis provides evidence that INVs use their networking capability to modify network-delaying processes, which can erode the value of social capital. Table 8-20 presents evidence that all of the INVs show signs of engaging in the network-delaying process, which appears to inhibit NVI. For example, Table 8-20 indicates Fertility's use of LRB or GRB in combination with DB are manifestations of the network-delaying process. Figure 8-8 also illustrates that Fertility shown a weakness in networking capability at the international start-up phase as this network-delaying process meant they over-extended their investment in mentor and investor social capital. For instance, Table 8-20 reports after Fertility used LRB to form ties with local mentors, they engaged in DB as section 8.5.2 confirms they were over-reliant on mentor referrals. Moreover, this network-delaying process is evident in quotation NDP1 within Table 8-20, as the entrepreneur describes that he had gained access to "hundreds of contacts from the two of them."

One interpretation of these findings is Fertility were more engaged in increasing the quantity rather than improving the initial quality of their social capital. Incidentally, Table 8-20 highlights that Fertility were also involved in this network-delaying process as these mentors introduced them to a Canadian VC who consequently inhibited their NVI. That is, quotation NDP2 within Table 8-20 describes that the entrepreneur felt "we were completely dependent on them [Canadian VC]. We didn't have any back-up alternatives and we were out of

money." Thus, section 8.4.1 describes Fertility retrenched these ties after this asset became a liability. This indicates Fertility's initial weakness in practicing these networking activities meant they had engaged in a network-delaying process that inhibited NVI. Similarly, Table 8-20 reports that HeartBeat use of GAB and DB was a network-delaying process that inhibited NVI. That is, quotation NDP5 within Table 8-20 describes the entrepreneur felt "a lot of companies find when trying to deal with potential [VC] investors, that they can hold you back a lot" Section 8.3.1 describes HeartBeat shown a weakness in performing these networking activities to secure venture capital as like Fertility, they were dependent on VC investor. Thus, this evidence indicates that the use of GAB and DB is one network-delaying process that can inhibit NVI.

Interestingly, Tables 8-20 and 8-21 report there is strong evidence that within this contextual setting, the use of GSB in combination with DB and/or IBG is a network-delaying process that inhibits NVI. However, Figure 8-1 reports a variation in practicing these activities as FemMed used GSB to create social capital with foreign buyers and suppliers, while SafeMed's GSB was more diverse as they used this activity to create buyer, supplier, investor, and mentor social capital. Nevertheless, Figure 8-11 illustrates SafeMed's their use of GSB was inadequate as they attempted to collaborate with actors that they were highly dependent on who subsequently inhibited their NVI. For example, quotation NDP3 within Table 8-20 describes that SafeMed "should have been a little bit more aware of who we were actually dealing with" when attempting to collaborate with the strategic decision makers of MNEs. Thus, this combination of GSB and DB appears to be a network-delaying process that is likely to inhibit NVI. Table 8-21 also reports on the dangers of DB. That is, section 8.6.1 explains there is strong evidence in some instances that an INV's over-dependence on certain actors, can evolve into an "impassiveness" or denial, especially when this social capital begins to decrease in value. Section 8.5.2 therefore reports that there is strong evidence that under these contextual conditions IBG is likely to inhibit NVI.

Table 8-21: Representative Data for Network-Delaying Process

	Impassive Bonding	Aggregate category 2 – Network-delaying process
Global search bridging	**FemMed –** Firm shown weakness in being able to search for a suitable foreign distributor and were unable to successfully bond with this tie	**NDP6** How often did we communicate or interact with this partner, well not enough. They did come over and meet with us, but essentially everything was done remotely. Once we signed the distribution agreement we had very little communication with them, apart from an update on how they were doing and any knowledge transfer that needed to happen. We probably met them perhaps every couple of months if you were lucky but most communication was either done verbally on the phone or through email that was a bit more regular [FER-I11-B2].
	SafeMed – Firm shown weakness in bonding as they had scant resources to form ties with investors, buyers and suppliers who inhibited NVI	**NDP7** Two [R&D partners] are in China and we have had some bad experiences there. Quality, timeliness, the Chinese guys we think were screwing us. On the design side we had an American guy who were taking far too long, charging big fees, and we then realised we could do this ourselves. So the R&D prototyping phase has been problematic. Not smooth sailing as I say through three different partners. And again causing us the same problems, delay, hence time problems, hence money problems [SAF-I10-B].
Local search bridging	**SafeMed –** Firm stopped interacting with mentor, which meant after their IPO, they were not eligible for government grants, which inhibited NVI	**NDP8** The government have been, well we have had three grants. So they have been useful but some could say they could have been more useful. We didn't get any big grants, the government hasn't given us any money apart from some small amounts of money. Could they have? Well I suppose that is a philosophical view on whether they should or shouldn't be investing in PLC's like us. You know they are all interested in our story. [Dr Christopher] has been up there doing presentations. They all say the right thing, but no one has ever come-forth with any real money [SAF-I10-B].
Local referral bridging	**Fertility** – Firm shown weakness in bonding with local mentors and investors, as actors became impassive about interacting with each other, which inhibited NVI	**NDP9** [Zhan]… he likes to go to work at 9:00 and get done at 5:00 and that's it. He is an academic scientist and so getting him to spread himself…he won't do it, and then he's like, oh, I'm going to take a four-week vacation in July [2009] and I'm thinking...[FER-I09-B]
Global referral bridging	**SafeMed –** Firm shown weakness in being able to refuse certain manufacturers (suppliers) that came as a result of a global referral, which is evident as they shown a lack of interest in the bonding process	**NDP10** Well you know it has been up and down sort of thing. Getting deals has obviously been a challenge. Being let down by the [North Carolina manufacturer] is a challenge. What that leads to is time, hence money. Because that means that everything is wasted. All those efforts, two or three year's effort basically trying to do this. You know we are being stretched out, every day we sit here burning cash is a day we got less and less money. And to be honest we are still not over the negotiation process yet. American's aren't easy they are pretty tough [SAF-I10-B].

Source: The Author

For example, section 8.3.2 reports FemMed engaged in DB with a US distributor, but then became impassive, as they were unable to extract value from this social capital. Quotation NDP6 within Table 8-21 also emphasises that after they signed the US distribution agreement they had "very little communication" with this actor. Consequently, quotation IB3 within Table 8-6 indicates the US distributor had "delayed us quite a lot" which meant they lost interest in this tie as "[e]ither they didn't want to sell it, or they didn't have the expertise, or they were promoting their own product so that was a big lesson learned." Thus, one possible interpretation of these data is FemMed had shown a weakness in these networking activities as they were unable to search for a suitable foreign distributor and struggled to bond with this tie, which inhibited their NVI.

Similarly, Table 8-21 also reports that SafeMed's use of GSB and IBG was a network-delaying process that inhibited their NVI. For example, section 8.5.2 reports that SafeMed

shown a weakness in bonding as they had scant resources to extend their buyer, supplier, and investor social capital. There is also strong evidence a large amount of SafeMed's social capital was beginning to burden the firm, which inhibited NVI. For example, quotation ND7 within Table 8-21 indicates that: "the Chinese guys [R&D consultants] we think were screwing us. On the design side, we had an American guy who were taking far too long, charging big fees, and then we realised we could this ourselves." A likely interpretation of these data is that FemMed were either overwhelmed or in denial about the growing liability of this social capital.

Additional evidence also indicates when SafeMed also practiced GRB and IBG this was a network-delaying process, which inhibited their NVI. For example, SafeMed shown a weakness in being able to conduct a critical evaluation of their mentor's referrals (e.g. North Carolina and New York manufactures) despite their initial collaboration concerns with these actors. Consequently, quotation ND10 within Table 8-21 emphasises that this IBG had led SafeMed to being "stretched out, every day we sit here burning cash is a day we got less and less money. And to be honest we are still not over the negotiation phase yet. Americans' aren't easy they are pretty tough." Figure 8-11 thus illustrates that SafeMed were initially weak in performing these networking activities, but shown no signs of improvement, as the subsequent networking period was characterised by weak practices in both bridging and bonding. A likely interpretation of these data is SafeMed's use of GSB and GRB in combination with IBG meant their networking capability was weak as they were unable to overcome these network-delaying processes, which inhibited their NVI.

Finally, Table 8-21 specifies even within local settings, the use of LSB or LRB in combination with IBG are network-delaying processes that inhibit NVI. For example, Table 8-21 indicates both Fertility and SafeMed's IBG with their mentors consequently inhibited NVI. For example, section 8.3.1 reports Fertility shown a weakness in being able to resolve conflict with local mentors, as their increasing impassiveness about this social capital delayed their NVI. Section 8.4.1 reports SafeMed decided to retrench ties with it government mentors, which meant after their IPO they were not eligible for government grants, which inhibited NVI. For example quotation ND8 within Table 8-21 emphasises this IBG had led to the view "I suppose that is a philosophical view on whether they should be investing in PLC's like us. You know they are all interested in our story. [Dr Christopher] has been up there doing presentations. They all say the right thing, but no one has ever come-forth with any real money." One interpretation of these data is SafeMed did not have the capacity to

foresee the potential value of this mentor social capital. Thus, together these findings indicate there is strong evidence that the network-delaying process triggers networking capability development in NVI.

8.6.3 Network-Modifying Process

Tables 8-22 and 8-23 report the various networking activities that underpin the network-modifying process. Firstly, Tables 8-16 and 8-17 report there is strong evidence that ETS and PTS both enable NVI. However, section 8.5.3 reports that the strength of the INV's capability to practice network modification activities has a varied influence on NVI. Table 8-22 also reports there is strong evidence that these INVs predominately use ETS and/or PTS in order to overcome or prevent the network-delaying process. Whereas, Table 8-23 reports in some cases there is evidence that these INVs use RTS to lubricate the network-enhancing process. Together, this section indicates these network modification activities in combination with these network-delaying and/or enhancing-processes lead to what the researcher terms as a "network-modifying process." Furthermore, the conceptual aggregation of these abductive findings is that this network-modifying process is fundamental for the development of networking capability in NVI. It is also evident that all of the INVs shown signs of stronger and weaker practices in using the network-modifying process to enable NVI.

Table 8-22 indicates that FemMed's use of ETS to overcome the network-delaying process is one example of the network-modifying process. That is, Table 8-16 confirms FemMed were reactive in using ETS to retrench their buyer social capital with a US distributor. Figure 8-6 also illustrates that FemMed's social capital lost a significant amount of value, as they were slow in preventing this asset from becoming a liability.

Table 8-22: Representative Data for Network-Modifying Process

	Network-delaying process	Aggregate category 3 – Network-modifying process
Eliminating ties	**Fertility –** Firm shown weakness in inefficiently using ET to retrench mentor and supplier social capital after it became a liability, but over the long-term this enabled NVI	**NMP1** And the other major situation through the last year was that we set up a new supplier in June and had three unsuccessful batches in July 2009, which we sold onto our customer. The next 9 months were fraught with batch after batch failure by the subcontractor, where we probably lost close to 6 figures, of just constant batch failure, trying to figure out why they failed. So I think the real culminating event was in July 2010, we said, right lets buy our old facility, let's do the production ourselves [FER-I11-A].
	HeartBeat – Firm shown initial weakness in using ET to retrench investor ties, but over time as they became stronger as they retrench investor social capital before it became a liability, which enabled NVI	**NMP2** At the end of the day, the problem is if you just bring in VCs then they will really tell you what to do, especially if you raise a few million, because you are going to have to give them some stupid numbers and they know that it is a joke, but they will use that to nail you. So if you get off-side with them about anything, if they cease for any reason and become true believers that there is a product problem, they will then use that and it becomes a nightmare. So we decided to walk away and raise cash the old fashioned by generating early sales [HEA-I10-B2].
	FemMed – Firm shown weakness in efficiently using ET to retrench buyer and supplier social capital as it became a liability, but this subsequently enabled NVI	**NMP3** In 2007, we had the deal break up with our distributor in the States because of low sales they just simply weren't promoting our products. We then sat back and said we could do one of two things, we can go for another multinational but chances are they won't be interested because we don't fulfil all their criteria. So we decided lets raise the money ourselves and go into the States and fight with the big players in their own territory. So I think that was a significant change [FEM-I08-C].
	SafeMed – Firm shown weakness in incorrectly using ET as they decided to retrench mentor social capital which still had value, which inhibited NVI	**NMP4** Yes, our early design partnership, which we had for a couple of years, didn't progress to any great extent. We, in fact, you know, looking at it with hindsight, you know, you would say that there was no incentive or desire on their part to push our products fast, because they kept getting paid. So the more they could kind of, not so much delay it, but not really progress it, they just kept getting paid, so in the end we ditched them and did a lot of our own things. So, yes, on the design and development side there are people that have held us back [SAF-I09-D].
Prioritising ties	**Fertility** – Firm was reactive in using PTS to modify mentor social capital, but when used, this activity enabled NVI.	**NMP5** Yep. In my view it's very important especially in the biotech industry. In terms of business development and trying to find out deals for commercialisation, networks are huge. So after those guys [Adam, Sean, George] we focussed our efforts on [Harry], he's a really good strategy guy. He also makes other networking connections. So, from a Board level, CEO kind of thing, he's a good spot. He's also been helping us with R&D connections, connections at the university. So, yes, he's now a very key person for us [FER-I09-A].
	HeartBeat – Firm was proactive in using PTS to modify their supplier social capital, which enabled NVI	**NMP6** So we've been kind of in a somewhat of a holding pattern, just to make incremental progress, but slower than what we would want to. We're just snowed under with demand at the moment. It's just crazy. So I think the market's changing. Now we're back, we're overflowing with people wanting the product. But because we have limited resources, we also have limited manufacturing capacity and when someone comes and says they want 30 monitors, it's not like you have a stock of 30 monitors; we manufacture them more or less to order. So we're actually losing orders at the moment. It's crazy so we need to make that change [HEA-I09-C].

Source: The Author

Therefore, Figure 8-10 illustrates that FemMed had shown an initial weakness in their networking capability, as they were inefficient in using ETS to retrench this buyer social capital. Nevertheless, quotation NMP3 within Table 8-22 emphasises that this process had long-term benefits as it enabled NVI:

> In 2007, we had the deal break up with our distributor in the States because of low sales they just simply weren't promoting our products. We then sat back and said we could do one of two things, we can go for another multinational but chances are they won't be interested because we don't fulfil all their criteria. So we decided lets raise the money ourselves and go into the States and fight with the big players in their own territory. So I think that was a significant change [FEM-I08-C].

One interpretation of these data is this network-delaying process triggered FemMed's decision to use ETS as a mechanism to retrench this social capital. Moreover, Table 8-16 confirms after FemMed used ETS, they were successful in building a relation with a Californian surgeon who helped establish a US sales subsidiary. Therefore, Tables 8-22 confirms that FemMed's use of the network-modifying process helped overcome the network-delaying process, which over the long-term enabled their international expansion. Fertility were also similar as they were reactive in their use of ETS to retrench their supplier social capital with an English manufacturer. Moreover, Figure 8-6 also illustrates that Fertility had lost a significant amount of value as their slow response meant this social capital became a liability. Nevertheless, quotation NMP1 within Table 8-22 confirms that the firm "had lost close to six figures" due to "constant batch failure" but "the real culminating event was in July 2010, when [they] said right lets buy our old facility, let's do production ourselves." Therefore, one possible interpretation of these data is this network-delaying process triggered a network-modifying process that encouraged them to internalise production, which consequently enabled NVI.

Similarly, Table 8-22 also reports that SafeMed were reactive in their use of ETS to retrench supplier social capital that had become a liability. That is Figure 8-6 illustrates that due to SafeMed's use of DB and IBG, this led to their supplier social capital losing a significant amount of value. Table 8-22 discussion of SafeMed's strategic alliances with Chinese and American R&D consultants is one example of this. That is, quotation NMP4 within Table 8-22 indicates SafeMed's entrepreneur views on the liability of this social capital:

> Looking at it with hindsight, you know, you would say that there was no incentive or desire on their part to push our products fast, because they kept getting paid. So the more they could kind of, not so much delay it, but not really progress it, they just kept getting paid, so in the end we ditched them and did a lot of our own things. So, yes, on the design and development side there are people that have held us back [SAF-I09-D].

Quotation ND7 within Table 8-21 also confirms that after SafeMed retrenched these foreign supplier ties, they then realised "we could do the [R&D] ourselves." Consequently, a likely interpretation of these data is this network-delaying process triggered this network-modifying process that encouraged SafeMed to internalise R&D, which consequently enabled NVI. Nevertheless, Figure 8-11 illustrates that SafeMed shown no sign of networking capability development despite this event, as this subsequent networking period was characterised by weak practices in GSB along with DB and IBG. By contrast, Table 8-16 confirms that HeartBeat were stronger in their use of ETS as they retrenched investor social capital with a US VC before it became a liability. For example, quotation NMP2 within Table 8-22 indicates that HeartBeat felt "if you get off-side with them [VCs] about anything, if they cease for any reason and become true believers that there is a product problem, they will then use that and it becomes a nightmare. So we decided to walk away and raise cash the old fashioned way by generating early revenues." Thus, a possible interpretation of these data is this network-delaying process triggered a network-modifying process as this encouraged HeartBeat to implement an early product launch, which consequently enabled NVI.

Table 8-22 also reports that Fertility and HeartBeat's involvement in network-delaying processes encouraged the use of PTS, which together form part of a network-modifying process. For example, Table 8-16 confirms that Fertility were mainly proactive in using PTS to retrench their strong ties with a group of local mentors. Figure 8-5 illustrates that Fertility's use of PTS did decrease the value of this mentor social capital, but not to the extent that this asset became a liability as it maintained a reasonable level of value. Figure 8-8 therefore illustrates that Fertility had begun to show signs of networking capability development as they began to improve the way they practice PTS. Quotation NMP5 within Table 8-22 emphasises this increased use of PTS:

> In my view [networking is] very important especially in the biotech industry. In terms of business development and trying to find out deals for commercialisation, networks are huge. So after those guys [Adam, Sean, George] we focussed our efforts on [Harry], he's a really good strategy guy. He also makes other networking connections. So, from a Board level, CEO kind of thing, he's a good spot. He's also been helping us with R&D connections, connections at the university. So, yes, he's now a very key person for us [FER-I09-A].

Quotations PTS1, PTS2 and PTS3 within Table 8-9 indicates Fertility's entrepreneur believed these mentors were "instrumental" at the "small stages" – i.e. at international start-

up – but they were no longer pertinent to their NVI. One likely interpretation of these data is that Fertility had anticipated these ties could "delay" the firm's long-term development. Therefore, this network-modifying process helped Fertility prevent a potential network-delaying process as they refocused and extended their ties with Harry, which increased the value of their mentor social capital. Table 8-17 therefore confirms that Fertility's use of PTS eventually enabled their NVI. Similarly, Table 8-26 also reports that HeartBeat were proactive in using PTS to retrench their strong ties with a local manufacturer. Interestingly, Figure 8-7 illustrates that Heartbeat also used PTS to change a supplier relationship, but this activity only decreased the value of this supplier social capital by a marginal amount as it maintained a reasonable level of value.

For example, quotation NMP6 within Table 8-22 describes since HeartBeat "have limited resources, we also have limited manufacturing capacity, [which means we] manufacture more or less to order. So we're actually loosing orders at the moment. It's crazy so we need to make that change." Section 8.3.2 explains that SafeMed's entrepreneur tends to "deal with smaller people who I've known, you know, previously, who I can kind of trust. Because what you can't afford to do is make too many mistakes, if you've got limited resources in terms of dollars and time, you people you can trust [HEA-I09-B]." Nevertheless, quotation PTS4 within Table 8-19 explains that HeartBeat "finished up with our local manufacturer [as the Hong Kong manufacturer…] could scale up our manufacturing and they can produce more product in a day than our [local] manufacturer could produce in a month." Therefore, one possible interpretation of these data is this network-delaying process triggered a network-modifying process as this encouraged the firm to switch suppliers, which consequently enabled NVI.

Table 8-23: Representative Data for Network-Modifying Process (Cont.)

	Network-enhancing process	Representative Quote
Reconfiguring ties	**Fertility** – Firm shown strength in using RTS to redeploy its customer into investor social capital, which enabled NVI	**NMP7** Chasing money is a waste of time, the only place where you should chase money is through a customer, you are wasting your time with a bank, you are wasting your time with equity people, they are going to take so long and they are under no pressure to invest. So this is at least my conclusion, I'm sure people would disagree, but that is how we have got through the last three years [FER-I11-A].
	HeartBeat – Firm shown strength in using RTS to redeploy their mentor into investor social capital which enabled NVI	**NMP8** So he [Dr Arthur] brings some credibility to it as well since he is a cardiologist and we use his reputation to bring in the venture capital and impress on people. If you have a cardiologist as one of the principles of the company they don't doubt what you say it does right. So it gives you credibility in that regard [HEA-I10-A].
	HeartBeat – Firm shown strength in using RTS to redeploy its mentor into buyer social capital, which enabled NVI	**NMP9** We really market by word of mouth. So what's happened, we've built up, in the research market, we've built up a critical mass. so we have so many people using our product who we initially done research with, and they go to conferences and present their papers, and immediately after some of the big conferences in wireless health or whatever, we get a rash of emails from other researchers who want to use our devices [HEA-II09-B].
	HeartBeat – Firm shown strength in using RTS to redeploy its supplier into buyer social capital, which enabled NVI	**NMP10** Our lawyer is basically trying to negotiate that [EliteTech] sell our products to their customers as well. So part of the negotiation is whether they will finance this. The big problem with contract manufacturing is you often have to pay upfront because they have to go out and buy the components. So if you can negotiate and get [EliteTech] to agree to you only paying them for the finished product then you haven't really got a cash flow problem because you can line the customers up, which means you wouldn't be manufacturing unless you have customers [HEA-I10-A].
	FemMed – Firm shown strength in using RT to redeploy its investor and mentor social capital to enable NVI	**NMP11** They [Harmony] have become friends to all of us. There is complete trust, and they were there one hundred percent and got their return on their investment at the end of it. Which is fantastic not just for them, but for Scotland, which is a great success story [FER-I11-B3].
	FemMed – Firm shown strength in using RT to redeploy its buyer into mentor social capital, which enabled NVI	**NMP12** We have been able to publish that he has done all of these surgeries, and say what are the complications, what are the success rates, so that really gave us a good start in terms of having a good preceptor surgeon we could work with. Also he is somebody who really has been shouting about [FemMed] from the hill tops, that we have done over 4000 cases with less than 1% error rate whereas other companies have 6-30% error rate, so these are the benefits of that [FEM-I11-B2].

Source: The Author

Interestingly, Table 8-23 reports there was strong evidence that three (e.g. Fertility, HeartBeat and FemMed) of the four INVs used RTS as means to accelerate the network-enhancing process. That is, cross-case findings up until this point suggest the network-modifying process is predominately a reactive process in response to the erosion of social capital. Nevertheless, there is strong evidence that the network-modifying process has a dual purpose, as it seems to complement and indeed accelerate the networking-enhancing process. However, Table 8-23 indicates that RTS also facilitates this process as this encapsulates the decision to redeploy strong ties for new industrial purposes. For example, Table 8-17 confirms Fertility were proactive in using RTS to redeploy their strong ties with a Canadian distributor. Figure 8-6 also illustrates that Fertility used RTS to change this customer relation, which helped accelerate the value of this social capital. Relatedly, quotation NMP7

within Table 8-23 emphasises why this networking-modifying process accelerated the value of this buyer social capital:

> Chasing money is a waste of time, the only place where you should chase money is through a customer, you are wasting your time with a bank, you are wasting your time with equity people, they are going to take so long and they are under no pressure to invest. So this is at least my conclusion, I'm sure people would disagree, but that is how we have got through the last three years [FER-I11-A].

Additionally, quotation RTS1 within Table 8-9 indicates Fertility were "getting more creative in how we finance ourselves, in this time, where traditionally banks were there" which in this case was in the midst of the GFC. One possible interpretation of these data is that Fertility shown a strength in using RTS to redeploy this buyer tie into an investor tie, which evidently increased the value of this social capital. Therefore, in line with Table 8-17 it is evident that this network-modifying process enabled NVI. Similarly, Table 8-23 also confirms that HeartBeat were proactive in using RTS to redeploy their strong ties with a Hong Kong manufacturer. That is, Figure 8-7 illustrates that HeartBeat's use of RTS to change this supplier tie helped accelerate the value of this social capital. Consequently, quotation NMP10 within Table 8-23 confirms that HeartBeat's "lawyer is trying to negotiate that [EliteTech will] sell our products to our customers as well. So part of the negotiation is whether they will finance this."

Quotation NMP10 also specifies: "The big problem with contract manufacturing is you often have to pay upfront because they have to go out and buy the components. So if you can negotiate and get [EliteTech] to agree to you only paying them for the finished product then you haven't got a cash flow problem." A likely interpretation of these data is HeartBeat shown a strength in using RTS to redeploy this supplier into both a customer and investor, which evidently helped increase the value of social capital. This interpretation indicates HeartBeat were successful in making this social capital multiplex as this tie could be used for multiple purposes. Therefore, in line with Table 8-17 it is evident this network-modifying process accelerated the network-enhancing process, which enabled HeartBeat's NVI.

In similar vein, Table 8-23 confirms that HeartBeat and FemMed both shown a strength in using RTS to redeploy its strong mentor ties with US surgeons. That is, Figure 8-5 illustrates that HeartBeat and FemMed use of RTS helped accelerate the value of this mentor social capital. For example, quotation NMP8 within Table 8-23 confirms within HeartBeat that:

"[Dr Arthur] brings some credibility to it [the venture] as well since he is a cardiologist and we use his reputation to bring in the venture capital and impress people." Additionally, quotation NMP12 within Table 8-23 specifies within FemMed: "We have been able to publish that he [Californian surgeon] has done all of these surgeries, and say what are the complication, what are the success rates, so that really gave us a head start in in terms of having a good preceptor surgeon we could work with." Consequently, a likely interpretation of these data is both INVs shown a strength in using RTS to redeploy their strong ties as both surgeons agreed to become KOLs (e.g. preceptor surgeons), which evidently accelerated the value of this mentor social capital. Therefore, in line with Table 8-17 it is evident this network-modifying process enabled both firms NVI.

Table 8-23 also confirms that HeartBeat and FemMed were able to build deep and multiplex inter-personal relations with mentors. That is, Figure 8-5 illustrates that HeartBeat's use of RTS with their university network, helped accelerate the value of this mentor social capital. That is, quotation NMP9 within Table 8-23 specifies that HeartBeat have "built up a critical mass in the research market, [as they] have so many people using our product we initially did research with [and once] they go to conferences and present their papers […] we get a rash of emails from other researchers who want to use our devices." Additionally, section 8.2.2 specifies HeartBeat initially formed ties with universities as a R&D partner and mentor, but as they struck an intellectual connection with the academic community, they were able to redeploy this mentor social capital, as these academic relations eventually became customers. Therefore, in line with Table 8-17 it is evident that this network-modifying process enabled NVI. Overall, Figure 8-9 then illustrates that HeartBeat had shown signs of networking capability development as this subsequent networking period was characterised by a strength in AB and tie transformation.

Finally, Table 8-23 confirms that FemMed were also able to build an inter-personal relation with what began as an inter-organisational tie. That is, Figure 8-4 illustrates that Fertility's use of RTS with Harmony their local BAS helped transform this social capital. Quotation NMP11 within Table 8-23 exemplifies this strength in AB and RTS since:

> They [Harmony] have become friends to all of us. There is complete trust, and they were there one hundred percent and got their return on their investment at the end of it. Which is fantastic not just for them, but for Scotland, which is a great success story [FER-I11-B3].

Section 8.4.1 explains that FemMed had built a strong relation with Harmony over a six-year turbulent period, as this concluded with the firm achieving a trade-sale, which provided the founders and the BAS with a strategic exit. A likely interpretation of these data is given that, Harmony had "become friends to us all," and that "there was complete trust" it is evident that FemMed shown a strength in using RTS to redeploy this strong investor tie into mentor tie. Therefore, this change evidently increased the value of this social capital. Moreover, a likely interpretation is this friendship was clear a relational source, while Harmony's "continued belief and shared-vision" was evidently a cognitive source that laid the foundations of this long-term friendship. Given these ties were with some of Scotland's leading business investors, it is clear that this social capital would have personal and career benefits in the years to come. Overall, Figure 8-10 then illustrates that FemMed had shown clear signs of networking capability development as this subsequent networking period was characterised by a high intensity of AB and tie transformation. Therefore, there is strong evidence that this network-modifying process accelerates the network-enhancing process, which enables networking capability development in NVI.

8.7 Conclusion

In conclusion, this chapter reports the cross-case findings on how technology start-ups build dynamic capabilities in networking to enable NVI. Table 8-24 therefore summarises these cross-case findings. Firstly, Table 8-24 indicates that this chapter achieves research objective one and reports on how INVs create, extend, and modify their social capital in high-technology markets. The major findings to emerge from this research objective is the researcher found strong evidence that these INVs use eleven specific networking activities to create, extend, or modify their social capital

Table 8-24: Summary of Cross-Case Findings

	Summary of Cross-Case Findings
Objective 1 – To explore how INVs create, extend, or modify their social capital in high-technology markets.	RQ1: How do INVs create social capital?
	• Findings indicate that the INVs used a combination of five networking activities to create social capital. • These networking activities consisted of (a) LRB, (b) GRB, (c) LSB, (d) GSB, and (e) GAB and emerged as second-order themes. • The practice of these networking activities involved using referrals, search, or being approached by new actors, which originated either at the local or global level. These practices emerged as ten first-order concepts. • GRB was the most widely practiced networking activity (14 instances) which helped create buyer, investor, and supplier social capital, whereas LRB was rarely practiced with the exception of Fertility who used this activity on 11 occasions to create social capital. • LSB and GSB were specifically used to create inter-organisational social capital. None of the INVs used these networking activities to create inter-personal social capital, which suggests that LSB and GSB are predominately firm-level activities. • GSB was mainly used to create buyer and investor social capital, while LSB was mainly used to create mentor and supplier social capital. • Three of the four INVs used GAB to create social capital. Data analysis suggests that each firm's unique technology enabled them to engage in this networking activity with predominately mentors and investors.
	RQ2: How do INVs extend their existing social capital?
	• Findings indicate that the INVs used a combination of three networking activities to extend their existing social capital. • These networking activities consisted of (f) IBG, (g) DB, (h) AB and emerged as second-order themes. • The practice of these networking activities either involved a high or low resource intensity, along with a high or low interaction frequency. These practices emerged as six first-order concepts. • IBG and AB emerged as networking activities that occur at opposite ends of the emotional spectrum. IBG was implicitly used after the formation of weak ties, while AB was used to accelarse the formation of strong ties. • SafeMed was found to use IBG most frequently (5 instances), while HeartBeat was found to use AB most frequently (5 instances). • DB was found to be an inevitable networking activity in the extension of investor and buyer social capital. In Fertility and SafeMed case, they also used DB to extend their mentor social capital, which subsequently became a liability for these firms'.
	RQ3: How do INVs modify their social capital?
	• Findings indicate that the INVs used a combination of three networking activities to modify their social capital. • These networking activities consisted of (i) ETS, (j) PTS, (k) RTS and emerged as second-order themes. • The practice of these networking activities either involved the retrenchment (i.e. phase out) of weak or strong ties, or the redeployment (i.e. use for another purpose) of strong ties. These practices emerged as six first-order concepts.

	• The use of ETS – the retrenchment of weak ties – was found to be the most widely practiced networking activity in order to modify buyer, supplier, and investor social capital. • The use of PTS – the retrenchment of strong ties – was the least practiced networking activity, but was used to modify mentor and supplier social capital. • Three of the four INVs used RTS – the redeployment of strong ties – as a networking activity to modify their social capital. In each case, these firms were able to use this social capital for multiple purposes such as encouraging customers to invest financial capital in the business.
Objective 2 – To examine why certain networking activities enable or inhibit NVI.	RQ4: Why do certain networking activities enable or inhibit NVI?
	• The major finding to emerge from this research objective is each networking activity had a varied influence on NVI. • There is strong evidence that AB and GAB enables NVI. Specifically, in three of the four case firms, these networking activities were found to accelerate relationship development and enable their NVI. • Additionally, there is strong evidence that GSB and IBG inhibits NVI. Specifically, it was found that when INVs use GSB before they own unique resources, this is likely to inhibit NVI. Moreover, there was strong evidence across cases that the use of IBG inhibits NVI. • Findings show these case firms' vary in their ability to practice certain networking activities, which determines whether they enable or inhibit NVI. • For example, Fertility and HeartBeat were both strong at practicing GRB to create buyer social capital which enabled their NVI, whereas, they both were weak at practicing GRB to create investor social capital which inhibited their NVI. • Similarly, all case firms varied in their ability to use DB to extend social capital. That is, FemMed were strong in practicing DB to extend investor social capital as this activity enabled NVI, whereas HeartBeat and SafeMed were weak in practicing DB to extend investor social capital as these activities inhibited NVI. • Finally, there is strong evidence that PTS and RTS enables NVI. However, it emerged when the case firms were proactive in practicing ETS this enabled NVI, whereas when they were reactive in practicing ETS this initially inhibited NVI.
Objective 3 – To determine which network processes underpin networking capability development in NVI.	RQ5: Which network process underpin networking capability development in NVI?
	• Emergent findings indicate that three overarching network-processes underpin networking capability development in NVI. • These network-processes consist of the (1) network-enhancing process, the (2) network-delaying process, and (3) the network-modifying process that emerged as three overarching aggregate categories, that aggregate eleven second-order themes, which aggregate several first-order concepts. • AB in combination with GAB and stronger practices in LRB, GRB, LSB, and DB was found to underpin the network-enhancing process. • IBG in combination with GSB and weaker practices in LRB, GRB, LSB, and DB was found to underpin the network-delaying process. • All firms encountered the network-delaying process but differed in their ability to learn from delays that occurred from the creation and extension of social capital. • The network-delaying process was found to trigger the use of ETS, PTS, and RTS, which underpins the network-modifying process. • The use of RTS in the network-modifying process involved the nurturing of core ties, which helped accelerate the network-enhancing process. • The use of ETS and PTS in the network-modifying process was found to shift the firms' reliance from impersonal relations towards future aspirations to internalise operations, which helped create new network-enhancing processes.

Source: The Author

Specifically, section 8.2 reports INVs use what the researcher terms as (a) LRB, (b) GRB, (c) LSB, (d) GSB, and (e) GAB as mechanisms to create social capital. Moreover, Table 8-24 reports contrary to existing literature, there are various types of bonding that help INVs extend their social capital. Specifically, there is strong evidence INVs use what the researcher terms as (f) IBG, (g) DB, and (h) AB in order to extend their social capital. Finally, section 8.4 reports strong evidence that INVs use what the researcher terms as (i) ETS, (j) PTS, (k) and RTS as mechanisms to modify their social capital.

Secondly, Table 8-24 indicates that this chapter achieves research objective two as the researcher reports on why specific networking activities enable or inhibit NVI in high-technology markets. The major findings to emerge from this case analysis is the researcher found strong evidence that in most cases the strength of an INV's capability to practice these networking activities determine whether they enable or inhibit NVI. For example, section 8.5 reports that there is strong evidence that the strength of the INVs networking capability to practice LRB, GRB, LSB, and DB will determine whether these activities enable or inhibit NVI. However, despite the capability-based nature of these activities, there is also strong evidence that the practice of GAB, AB, ETS, PTS, and RTS all enable NVI. There is also strong evidence within these cases that GSB and IBG inhibit NVI. Consequently, these findings provide insight into why certain networking activities enable or inhibit NVI in high-technology markets.

Table 8-24 also specifies that this chapter has achieved research objective three as the researcher reports on which network processes underpin networking capability development in NVI. The major findings to emerge from this cross-case analysis is the researcher found evidence of three overarching aggregate dimensions that categorise the development in networking capability in NVI. Specifically, section 8.6 reports that INVs use what the researcher terms as the (1) network-enhancing process, the (2) network-delaying process, and the (3) network-modifying process. Specifically, section 8.6.1 reports that the researcher found strong evidence that INVs use AB in combination with strong network creation activities as network-enhancing process. Consequently, these cross-case findings indicate that this network-enhancing process enables networking capability development in NVI. Secondly, the researcher also found evidence when INVs use IBG in combination with weaker network creation practices this leads to a network-delaying process. Interestingly, contrary to initial impressions, the researcher found strong evidence that this network-delaying process actually triggers the network-modifying process. That is, there is evidence

that the network-delaying process triggers a learning process that creates the need for a network-modifying process, which together underpins networking capability development.

Finally, Table 8-24 reports that the researcher found strong evidence that INVs use ETS, PTS, and RTS as a network-modifying processes. For example, there is evidence that INVs use ETS and PTS as network-modifying processes, which help overcome the network-delaying process. Thus, it is apparent that the network-delaying process triggers the use of this network-modifying process, which consequently enables NVI. Whereas, there is also evidence that INVs can use RTS as network-modifying process to accelerate the network-enhancing process. Therefore, together there is evidence that these network processes underpin networking capability development in NVI. The next chapter will therefore discuss these findings in relation to the literature and conclude on the implications of this abductive research.

9 – Discussion and Conclusion

Aim

To discuss the research findings in relation to existing literature and conclude on the contributions of this research.

Chapter Objectives

- To discuss the emergent findings in relation to existing literature that examines technology start-ups involvement in networking and internationalisation.
- To discuss the theoretical contributions of this research by proposing a process theory of networking capability development.
- To discuss the implications for public policy and practitioners.
- To discuss the research limitations and make recommendations for future research.

9.1 Introduction

This study explores how technology start-ups build dynamic capabilities in networking to enable their NVI. The primary contribution of this study makes an important step towards a process theory of *networking capability development*. The core purpose of this theory seeks to explain *how* firms build dynamic capabilities in networking to enable their growth and development. This study specifically contributes to NVI theory and to the wider field of strategic management within the context of high-growth potential entrepreneurial firms. The overarching revelation of this study is the thesis that "***networking capability development is an affect-based emergent process that enables NVI**.* " The implications of this argument are far reaching. Firstly, this argument offers an alternative assumption for NVI theory that entrepreneurs "affect" can enable NVI. This argument also moves toward reconciling the research problem that existing theories do not sufficiently explain how technology start-ups build dynamic capabilities in networking to enable NVI.

This chapter will now unfold these findings in relation to existing literature, develop a set of propositions to interpret these findings, and present an emergent process model that explains how firms build dynamic capabilities in networking to enable growth and development. This chapter will also discuss the limitations of this research and the implications that these findings have for future research, for policy-makers and for practice. Finally, this study will close with concluding remarks on the role a theory of networking capability development seeks to have within IE and wider strategic management research.

9.2 Toward a Process Theory of Networking Capability Development

The primary contribution of this research makes an important step towards a process theory of networking capability development. Therefore, this study contributes to the limited literature that identifies networking capability as one particular type of dynamic capability (e.g. Fernhaber and McDougall, 2005; Mort and Weerawardena, 2006; Tolstoy and Agndal, 2010). However, this study advances these contributions by responding to Zahra et al. (2006: 920) discussion that few empirical studies examine "how dynamic capabilities develop, emerge, or evolve in new or established organizations." Moreover, this study directly contributes to Sapienza et al. call for dynamic capability research that examines what INVs "do and the resources they control, including the social capital they and their managers have amassed" as this would be "enlightening" to advance future research (2006: 930). Indeed, Vogel and Güttel (2013) confirm in a recent bibliometric review that the dynamic

capabilities perspective "still lacks consensual concepts that allows for comparisons of empirical studies and advance the theoretical understanding of dynamic capabilities." Moreover, empirical research on the process by which dynamic capabilities emerge and solidify in the context of NVI is still an unsettled question in IE and wider strategic management research (Autio et al. 2011). This study therefore contributes to the dynamic capabilities debate within the theoretical context of IE research.

Interestingly, Dubini and Aldrich (1991: 312) were early to specify that it is "critical to investigate how an extended network is created, developed, and strengthened over time, and how an entrepreneur manages to embed the concept of personal network in the company's 'culture' so that the company itself becomes 'network orientated'." Despite this early observation, Chapter 4 explains that few studies have yet to explore *how* technology start-ups create, manage, or modify an evolving network of relationships. Indeed, Chapter 3 and 4 emphasise that most interpretations of dynamic capabilities (e.g. section 3.4) and networking (e.g. section 4.3) focus on large organisations and assume that actors begin with an established resource and/or network position. Consequently, Chapter 5 emphasises that the existing assumption that organisations begin with an established resource and/or network position does not fully reflect the reality of most technology-based new ventures (Ozcan and Eisenhardt, 2009; Autio et al. 2011). Additionally, Chapter 4 and 5 indicates that the existing networking capability interpretations do not resolve the research problem mentioned above.

Namely, existing networking capability interpretations describe *what* networking capabilities represent and entail, but are less clear on *how* networking capability develops over time, and *why* certain networking activities enable or inhibit NVI. Consequently, this thesis addresses the research problem outlined in Chapter 5 that *existing theories do not sufficiently explain how technology start-ups build dynamic capabilities in networking to enable NVI*. To overcome this research problem, this study makes a significant contribution to IE and wider strategic management research by proposing a process theory of networking capability development. To achieve this contribution, Chapter 5 explains the researcher used Helfat et al. (2007) asset orchestration framework and Nahapiet and Ghoshal's (1998) conceptualisation of social capital as a combined theoretical lens to examine the networking activities that enable or inhibit NVI. Since the use of this lens is still at an early phase of strategic management research (e.g. Nambisan and Sawhney, 2011; Chadwick et al. 2014), to the researchers knowledge this is the first entrepreneurship study to use Helfat et al. (2007) lens to explore dynamic capability development within the context of NVI. More

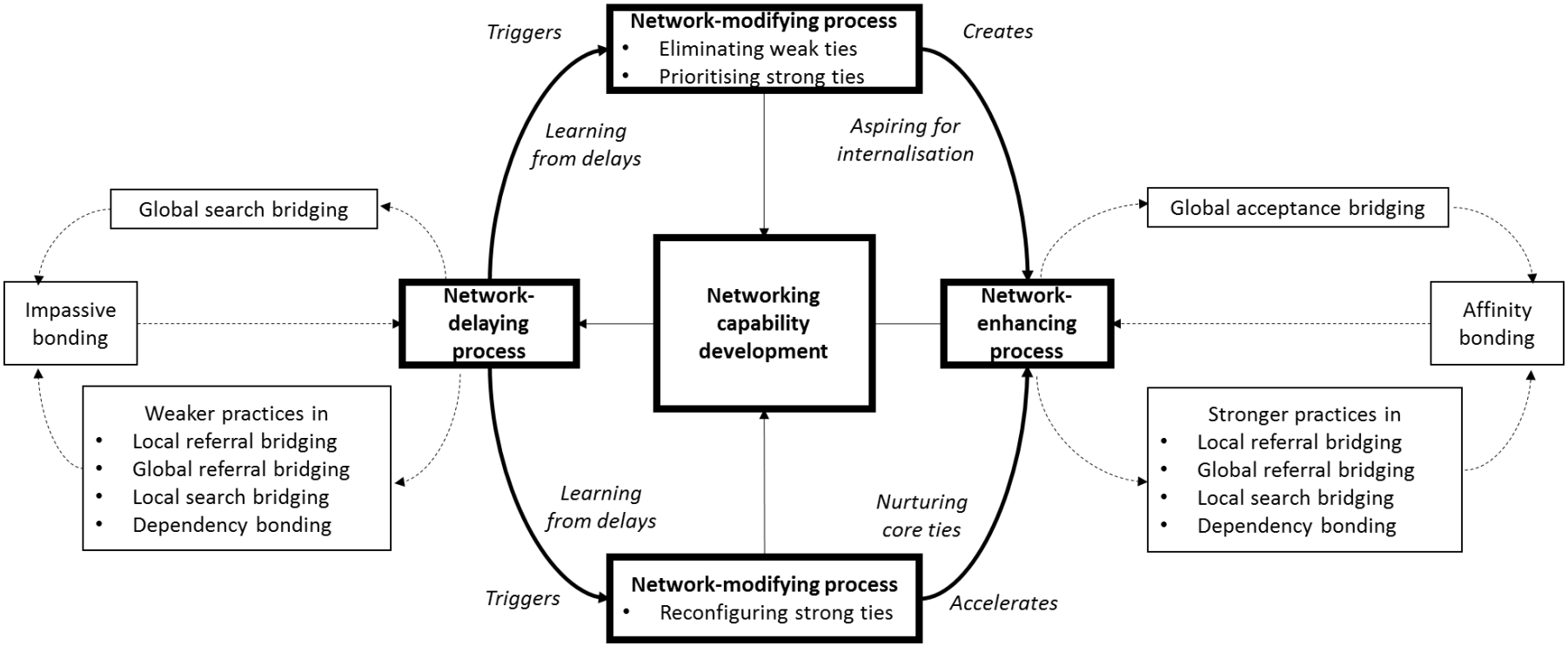
significantly, to the best of the researcher's knowledge, this is the first study to combine Helfat et al. (2007) and Nahapiet and Ghoshal (1998) as a unique theoretical lens to facilitate this theory building research.

Therefore, this primary contribution emerged on the basis that section 5.3 conceptualised *networking capability as the capacity of a focal actor to purposefully create, extend, or modify its social capital*. This conceptualisation then guided the researcher's working-thesis, which after initial cycles of data collection and analysis was that *networking is a process of dynamic capability development that involves the creation, extension, and modification of social capital, which is likely to enable NVI*. Consequently, by using this lens, this thesis has begun to unlock the black box of networking by identifying eleven distinct networking activities that technology start-ups use to create, extend, and modify their social capital. Consquently, the identification of these distinct networking activities is an important contribution to entrepreneurial network (e.g. Slotte-Kock and Coviello, 2010; Jack et al. 2010) and wider social capital (e.g. Seibert et al. 2001; McFadyen et al. 2004) research. For example, social capital researchers traditionally assume that bridging and bonding are general networking activities (e.g. Gittell and Vidal, 1998; Leonard, 2004), whereas, this study contributes to knowledge through the identification of specific *types* of bridging and bonding activities.

This process theory of networking capability development also contributes to recent calls in strategic management (e.g. Foss, 2011; Barney et al. 2011), entrepreneurship (e.g. Corner and Wu, 2011), and IE (e.g. Prashantham and Floyd, 2012) for more granular "micro-process" based research. This study has therefore explored how strong and weak practices of specific networking activities underpin what emerged as the (1) network-enhancing process, (2) network-delaying process, and (3) network-modifying process. Emergent findings indicate that together these three network-processes trigger, enable, and accelerate a virtuous cycle of networking capability development. Namely, this abductive research found that "learning from delays" and "nurturing core ties" were mechanisms that helped shift technology start-ups reliance from impersonal relations towards future aspirations to internalise operations. Therefore, this process theory contributes to recent research on how entrepreneurs "create something from nothing" (e.g. Baker and Nelson, 2005; Zott and Huy, 2007) on the assumption that cycles of networking capability *development* are an "affect-based" (Barron, 2008) emergent process that enables NVI.

Finally, the researcher used the "affect" concept – i.e. the feelings and moods of individual entrepreneurs – to problematize the traditional assumption (e.g. Larson and Starr, 1993; Hite and Hesterly, 2001) that networking is a calculated, efficient, and intentional process. Instead, these emergent findings indicate that the affect concept points to the emotional qualities of the entrepreneur, and assumes that networking capability *development* is more intuitive than it is calculated, and more emergent than it is intentional. Consequently, findings emphasise that entrepreneur's ability to "nurture core ties" helps accelerate networking capability development. Moreover, these core ties were found to help shift INVs reliance from impersonal relations to focus on how to internalise operations. Therefore, this thesis argues that early stage entrepreneurial firms should focus on "nurturing core ties," which challenges the efficiency assumption that organisations are able to optimially manage a growing network of strong and weak ties. Figure 9-1 therefore depicts this virtuous cycle of networking capability development. This chapter will now discuss these contributions by unfolding the core findings in relation to existing literature and will propose how technology start-ups build dynamic capabilities in networking to enable NVI.

Figure 9-1: Virtuous Cycles of Networking Capability Development: A Theory Building Approach



Source: The Author

9.2.1 Aggregate Category 1: Network-Enhancing Process

A central mechanism of how technology start-ups build dynamic capabilities in networking is what the researcher terms as the *network-enhancing process*, which is when the focal actor engages in networking activities that "enhances" the value of its social capital. Figure 9-1 illustrates this network-enhancing process is the first element that underpins this process theory of networking capability development. To begin with, an important finding is INVs use what the researcher labels as (a) LRB, (b) GRB, (c) LSB, (d) GSB, and (e) GAB as mechanisms to create social capital. These networking activities emerged from data analysis that practicing these activities either involved using (1) referrals, (2) search, or involved being (3) approached by new actors. Thus, this study found the origin of these ties encapsulate various forms of international scope, but to avoid complexity, the researcher followed the logic of Mors (2010) and Tippmann et al. (2012) by categorising these "bridging" activities as being either local or global in scope.

The identification of specific "bridging" activities is an important contribution to both the dynamic capabilities and social capital literature. In terms of dynamic capabilities, this research contributes to Helfat et al. (2007) argument that asset orchestration consists of organisational and managerial (i.e. entrepreneurial) processes that primarily involve (1) search and selection activities and (2) configuration and deployment activities. Consequently, LSB and GSB are clearly search activities, while one likely interpretation is LRB and GRB are selection activities since INVs leverage their referrals to "select" specific social capital. More importantly, these findings directly contribute to the social capital literature as most networking studies continue to discuss network creation as simply a "bridging" activity (e.g. Gittell and Vidal, 1998) when the focal actor seeks to capitalise on external "brokerage opportunities" (e.g. Burt, 1992, 2005). Nevertheless, rather than viewing referrals, search, or acceptance as a structural source of social capital (e.g. Nahapiet and Ghoshal, 1998; Adler and Kwon, 2002) it was apparent that these sources are indicators of specific networking activities, which consequently have various influences on NVI.

Consequently, Figure 9-1 illustrates the findings that when INVs show strength in practicing LRB, GRB, and LSB these bridging activities will form part of the network-enhancing process. For example, findings show that all of the INVs use GRB to create social capital. The researcher defines GRB as when the ego uses an alter's referral to create a foreign tie. Specifically, findings show INVs use GRB as a mechanism to create investor, mentor, buyer and supplier social capital and this was the most widely practiced bridging activity. Interestingly, findings show that HeartBeat and FemMed shown greater strength in using GRB to create investor, mentor and buyer social capital, whereas Fertility and SafeMed were weaker in practicing this activity. For example, HeartBeat shown evidence of using GRB to create investor social capital by asking their mentor (e.g. a US cardiologist) to connect them with a group of US angel investors. Additionally after FemMed's unsuccessful use of GSB – which section 9.2.2 elaborates on – the firm used GRB to connect with buyers. This activity was also apparent in Fertility who after various unsuccessful attempts at GSB, shown signs of capability development by using GRB to create buyer social capital.

These findings contribute to IE research as few studies consider the capabilities technology start-ups need to create social capital. For example, Sharma and Blomstermo (2003) found born-globals accumulate knowledge by creating an "optimal amount of weak ties" but are less specific on network content as they do not detail (1) which weak ties create knowledge and (2) the type of knowledge these weak ties create. Whereas, most IE research examines how technology start-ups existing social capital with core customers influences NVI (e.g. Yli-Renko et al. 2002; Presutti et al. 2007). Additionally in IE research, numerous networking studies focus on the *choice of entry mode*. For example, Coviello and Munro (1997) empirically report three of their four case firms were able to create foreign distribution agreements by *piggybacking* on their existing involvement in overseas production agreements. Freeman et al. (2006) also refer to the seminal work of Bell (1995) and found technology start-ups use *client-followership* as a strategy to mitigate risk when entering export markets. That is, Freeman et al. (2006) found technology start-ups use their existing client referrals to create new sales opportunities. Additionally, Freeman and Cavusgil (2007) report that technology start-ups choice of entry mode varies depending on the diversity and availability of foreign network ties. That is, Freeman and Cavusgil (2007) found technology start-ups show a complex networking behaviour where they create

"layers" of ties with foreign agents and distributors to "break-in" to new marketing and distribution networks.

Despite these contributions, this study found stronger evidence that INVs actually draw on their mentor social capital as an initial activity *before* using GRB to create buyer social capital. These findings then correspond with Coviello and Munro (1997) findings that it is not only existing customers who support the creation of new buyer social capital. Consequently, there is also evidence INVs initially use LRB or LSB to create mentor social capital. The researcher defines LRB as when the ego uses an alter's referral to create a local tie, while he defines LSB as when the ego searches new networks to create a local tie. For example, HeartBeat shown strength in practicing LRB to form ties with a government mentor who helped the firm with cross-border R&D activities. Fertility also used LRB to form ties with mentors, and then used GRB to create buyer social capital with MNEs. Additionally, FemMed shown a strength in using LSB as they formed ties with mentors and suppliers who enabled their NVI.

These findings contribute to IE research as few empirical studies exam how technology start-ups use local bridging to form foreign ties. However, one exemplar is Fontes and Coombs (1997) who found that Portuguese technology start-ups created external links with local distributors and agents as an initial step to enter unknown foreign markets. Fontes and Coombs (1997) suggest technology start-ups engage in an identification and evaluation process that involved (1) searching local intermediaries for synergies, (2) setting up specialist international groups, and (3) targeting large MNEs as potential customers to leverage their position on the value chain. Al-Laham and Souitaris (2007) also found that German biotechnology new ventures create a combination of local, national, and international R&D links to support early internationalisation. Specifically, the authors found that technology start-ups that centrally position themselves in local clusters and national research networks are more likely to form R&D alliances.

In addition to these findings, Collinson and Gregson (2003) found that technology start-ups embedded in local UK, US and Canadian knowledge clusters were more likely to create R&D alliances, which enables NVI. Moreover, Brännback et al. (2007) found evidence that knowledge diffusion predominately takes place through local channels and it is not until

born-globals exploit innovation (i.e. in form of patents or products) that knowledge diffuses across national borders. Prashantham (2011) also found from a survey of 102 Indian software SMEs that they use their local co-ethnic ties to enable the use of "higher-commitment entry modes" that are beyond exporting. Interestingly, three (HeartBeat, FemMed and SafeMed) of the four INVs were not centrally located in a "knowledge cluster" (e.g. a science park) *per se*, but did engage with the local R&D community to exploit their innovations across borders. Thus, these findings indicate that when INVs have a strength in practicing LRB and LSB these networking activities are likely to enable NVI.

Figure 8-1 also illustrates findings that when INVs have a strength in practicing DB this bonding activity will form part of the network-enhancing process. The researcher defines DB as when the ego commits a large amount of resource to interact frequently with the alter due to the ego's reliance on the future outcomes of this social capital. Interestingly, the researcher found under certain conditions DB is likely to enable NVI. Most notably, these findings indicate a certain amount of DB is inevitable when attempting to extend initial social capital with would-be foreign investors and customers. That is, all of the INVs engaged in DB, but Fertility and FemMed were the only firms to use this activity in a productive manner. For example, Fertility engaged in DB with a Chinese MNE to overcome the "trust-building" phase, before they could sign a major distribution agreement. Additionally, FemMed's successful involvement in due diligence with a large strategic buyer, shows signs of DB as they reallocated the majority of their resource to eventually secure a strategic exit.

The degree to which actors can manage dependency is an unsettled question in entrepreneurship and strategic management research. On the one hand, some researchers use resource dependency theory (e.g. Pfeffer and Salancik, 1978) as a power lens to explain how focal actors control exchange relations. Other researchers use transaction cost theory (e.g. Williamson, 1981, 1991; Dyer, 1996) as an efficiency lens to explain how focal actors reduce the costs of exchange relations. Consequently, the researcher's findings AB offers one way to help reconcile these conflicting views to help understand how firms enhance their social capital under conditions of resource scarcity and dependency. The researcher defines AB when two actors instantly bond through an intellectual, cultural, or empathic connection. Crucially this study found strong evidence when entrepreneurs form inter-personal relations

with actors *before* any economic involvement, these actors went on to have critical role within the business.

Findings also provide strong evidence that most of the entrepreneurs use AB as a mechanism to extend their mentor social capital. However, HeartBeat and FemMed were two cases who shown evidence that AB was not only limited to an individual, as all of the TMT were involved in building intimate connections with specific investors, mentors and even suppliers. For example, one of FemMed's entrepreneurs describe that their angel investors "have become friends to us all" and speak fondly of their local Scottish manufacturer. HeartBeat's entrepreneur also shows an innate quality to build inter-personal relations with local government officials, universities, health professionals and global R&D consortia, who had an intrinsic belief in the firm's products.

One interpretation of these findings is AB relates to what cognitive psychologists would term as "affect" (e.g. Forgas, 1995, 2000; Isen, 2002) which are the feelings and emotions that exert a strong effect on entrepreneurs cognitive schemas (Baron, 2008). Baron and Markman (2003) empirically report entrepreneurs "social competence" – i.e. their ability to interact effectively based on discrete social skills – enhances social capital and leads to greater financial success. Interestingly, De Carolis and Saparito (2006) propose entrepreneurs involved in sparse rather than cohesive networks are more likely to show cognitive biases through (1) overconfidence, (2) illusions of control, i.e. underestimation, and (3) representativeness, i.e. belief in validity of incomplete data. In other words, "hubris" (i.e. overconfidence) is more likely to reduce rather than increase the probability of new venture survival (Hayward et al. 2006). De Carolis et al. (2009: 527) test the influence of social capital and cognition on a sample of 269 entrepreneurs to find "that social capital is not enough; the type of person involved in network relationships matters to new venture creation." Therefore, these findings show that AB helps accelerate the creation and extension of social capital.

Another interpretation is these findings contribute to Hallen and Eisenhardt's (2012) recent revelations on tie formation efficiency. That is Hallen and Eisenhardt (2012) found "casual dating" with investors such as "simply asking for advice" is a subtle but effective cognitive tactic to ensure tie formation is less overt and more efficient. However, the authors warn

casual dating can show the new venture's vulnerabilities, so entrepreneurs must be cautious about their timing and focus of tie formation. Incidentally, the researcher's findings show when INVs have a strength in practicing these bridging activities, they were more likely to use AB to extend their social capital. Moreover, AB differs from Hallen and Eisenhardt's (2012) notion of casual dating, as AB is more intuitive than it is calculated, and more emotional than it is efficient. Figure 9-1 also depicts that when firms combine the use of these activities, this triggers what the researcher labels as a network-enhancing process, which is likely to enable NVI. Therefore, these findings lead to the researcher's first proposition:

> *P1: Technology start-ups that have a strength in local referral bridging, global referral bridging, local search bridging and dependency bonding are more likely to engage in affinity bonding which (a) triggers a network-enhancing process that (b) enables new venture internationalisation.*

Jack (2010) notes that a "Ptolemaic/Copernican analogy" provides a useful way to appreciate how the network appears from either the individual's perspective or that of the outside observer. That is, the Ptolemaic view of social networks suggests everything develops around the focal actor (i.e. the ego), while the Copernican view is less concerned with the ego, but the interdependent relationships that undergird a network structure (Jack, 2010: 130). Although this study does not research network structure, findings do show instances of where alters' initially approached the ego, which means the ego (i.e. the INV) accepted an alter's initial request to form a tie. For example, findings show that three (e.g. Fertility, HeartBeat, and FemMed) of the four INVs used GAB to create social capital. The researcher defines GAB as when an ego accepts an alter's request to form a global tie. Interestingly, there was strong evidence that when the focal actor accepted the alter's request to form a global tie, this social capital over the long-term enabled NVI. Findings show in each instance, the alter was attracted to the ego after the focal firm accumulated unique resources, which in all cases was a leading edge medical device. More crucially, findings show in most cases, alters did not initially approach the ego with an economic interest to sell their products, but with a scientific or medical interest in their unique technology.

Consequently, findings show after tie formation, the INVs engaged in AB with these actors due to an intellectual connection, which helped extend the value of this social capital. In

most cases, since these actors were medical professionals and university research groups they formed mentor and in some case customer relations with the firm. Therefore, these findings reinforce the economic argument put forth by resource based (Barney, 1991; Peteraf, 1993), resource dependence (Pfeffer and Salancik, 1978) and NVI (Oviatt and McDougall, 1994) theories that unique resources (i.e. inimitability) are the sufficient condition for sustained advantage. A likely interpretation of these findings is that INVs unique technology and products are what "attracted" these alter requests.

Additionally, networking based research on "homophily" provides an alternative interpretation of these results. That is entrepreneurship research on homophily has empirically found even when two actors occupy similar network positions, there is a tendency for alters to collaborate with partners who they share a personal and emotional attachment with (Uzzi and Gillespie, 2002; Ruef et al. 2003; Milanov and Fernhaber, 2009). Autio et al. (2011) found that INVs involved in technology-led industries develop a "language of organizing" in which the TMT uses cognitive processes (e.g. a shared vocabulary) to create new capabilities to respond to highly uncertain situations. Vissa and Bhagavatula's (2012) survey research also found strong empirical evidence that technology entrepreneurs improve their chances of initiating economic exchanges with persons that spoke the same language and whose objectives were congruent with the entrepreneurs' immediate task priorities. These findings then indicate unique resources are likely to attract desirable partners who do not threaten the business and the use of AB is what strengthens such ties. Therefore, these networking behaviours lead to the researcher's next proposition:

> *P2: Technology start-ups are more likely to use global acceptance bridging after they accumulate unique resources and when used with affinity bonding will (a) trigger a network-enhancing process that (b) enables new venture internationalisation.*

9.2.2 Aggregate Category 2: Network-Delaying Process

An important mechanism that underpins how technology start-ups build dynamic capabilities in networking is what the researcher terms as the network-delaying process, which the researcher defines *when the focal actor engages in networking activities that "delays" an organisations growth and development*. Figure 9-1 depicts this network-delaying process, which is the second element that underpins this process theory of

networking capability development. Contrary to initial impressions, findings show the network-delaying process can trigger the network-modifying process, which is a critical mechanism for networking capability development in NVI. Consequently, when INVs engage in what the researcher terms as "learning from delays" there is evidence that this learning mechanism contributes to a virtuous cycle of networking capability development. The researcher defines learning from delays as experiential learning that emerges when attempting to overcome delays from social capital. However, Figure 9-1 does illustrate findings that when INVs are weak in practicing LRB, GSB, LSB, and DB, these activities will form a network-delaying process that inhibits NVI. Therefore, it is *how* the INV responds to such delays is what drives networking capability development.

Interestingly, findings show if INVs use LRB, LSB, or GRB to form ties with the wrong partner, there is clear evidence that some firms would then use DB in attempt to extend this social capital. However, in some cases these weaker practices would evolve into what the research terms as IBG. The researcher defines IBG as when the ego commits a large amount of resource to the alter but limits interaction following disinterest in this social capital. Therefore, findings indicate that IBG and AB are at opposite ends of the emotional spectrum. These networking activities thus contribute to inter-organisational network theory's discussion on the distinction between "arm's-length" and "embedded ties" (Thorelli, 1986; Powell et al. 1996; Uzzi, 1997). That is, Uzzi (1997) argues transactions either take place through loose connections of individuals who maintain impersonal and constantly shifting market based exchange ties (e.g. arm's length) or through stable networks of exchange partners who maintain close social relations (e.g. embedded ties). IBG thus contributes to discussion on arm's length ties, while AB contributes to discussion on embedded ties. However, since most network research focusses on inter-organisational ties, it is evident entrepreneurial firms use these bonding activities *after* the formation of both inter-personal and inter-organisational ties.

Consequently, findings show when INVs are weak in practicing bridging activities they are likely to engage in IBG, which is a network-delaying process that inhibits NVI. For example, Fertility used LRB to form inter-personal ties with Dr Shi who was the inventor and patent holder of the firm's unique technology. Despite Dr Shi being a "co-founder" it is evident he did not desire a "commercial involvement" and only wanted to consult on R&D. However,

Fertility were dependent on Dr Shi's links to Chinese MNEs, which led to DB, and to a period of IBG as Fertility's TMT no longer interacted with the mentor, which inhibited NVI. Interestingly, SafeMed engaged in the most IBG of the four case firms. One episode is when SafeMed used LSB to create ties with a local government advisor who helped secure government grants, but given their desire to raise an IPO, they felt this local advisor was no longer relevant and decided to limit interaction. However, after their IPO, they were still unable to raise a sufficient financial capital, and then realised they were not eligible for future government grants, which meant this IBG inhibited their NVI.

These findings contribute to the IE literature on the local challenges that inhibit NVI. For example, Styles and Genua (2008) found that Australian academic entrepreneurs encountered difficulties in creating global R&D networks as their location limited research-based opportunities to access specialised knowledge. Gilding (2008) also reports on the "intensive regionalism" and "precocious internationalism" that Australian dedicated biotechnology firms endure when operating in regional clusters. In their social network study, Gilding (2008) found involvement in local Australian clusters meant access to international ties was "precarious" and cultural hurdles exacerbated these challenges where firms favoured UK and US partners opposed to Japanese and South Korean firms. Moreover, Gassman and Keupp (2007) discuss the network delays born-global firms encounter who are active in the Australian, Swiss, and German biotechnology industries. Specifically, Gassman and Keupp (2007) found born-globals have a tendency to overinvest in their scientific networks, which helps access technological knowledge cost efficiently, but limits their interaction with industrial networks as this prevents access to market sensitive knowledge.

Findings also show when INVs are weaker in practicing GRB in the formation of inter-organisational ties, this can lead to DB and IBG, which is a network-delaying process that inhibits NVI. For example, SafeMed used GRB as they relied on a US FDA consultant to connect them with a North Carolina distributor and manufacturer. Consequently, longitudinal findings show SafeMed were dependent on these referrals after it emerged they collaborated with the wrong strategic partners. That is, since this three-way agreement was contingent on the North Carolina manufacturer funding the specialised equipment this led to a period of DB. However, when the manufacturer refused to pay for the production equipment this led to a period of IBG as SafeMed lost interest in this tie, which inhibited

their NVI. Similar results are also apparent in Freeman and Cavusgil (2007) who found born-globals in technology-industries will often decide on their first foreign market entry on the basis of where they can create new connections irrespective of geographic and cultural considerations. Thus, Freeman and Cavusgil (2007) found that only relying on global referrals is risk intensive and highly uncertain process due to the unfamiliarity of building network relationships in geographical or culturally distant markets. Based on these findings, this leads to the researcher's third proposition:

> *P3: Technology start-ups that are weak in practicing local referral bridging, global referral bridging, local search bridging and dependency bonding are more likely to engage in impassive bonding, which (a) forms a network-delaying process that (b) inhibits new venture internationalisation.*

Oviatt and McDougall (1994) argue unique resources are the sufficient condition of sustainable INVs. Consequently, this study contributes to this proposition, but indirectly, as there was strong evidence when INVs engage in certain networking activities *without* unique resources this was likely to inhibit NVI. For example, findings show FemMed and SafeMed both used GSB to create investor, buyer, and supplier social capital. The researcher defines GSB as when as when the ego searches new networks to create a foreign tie. Interestingly, there was strong evidence that when INVs used GSB *before* they accumulate unique resources they were likely to engage in IBG, which inhibits NVI. For example, FemMed used GSB to create ties with a large US distributor prior to owning a granted patent or a unique portfolio of products. Therefore, findings show the firm had decided to collaborate with the wrong partner as despite engaging in DB to strengthen this tie, the MNE failed to sell their products. FemMed then became increasingly impassive about this tie, which indicates this network-delaying process inhibited their NVI.

Similarly, SafeMed also used GSB as their central mechanism to create investor, mentor, buyer, and supplier social capital. In this case, longitudinal findings show that the INV shown a weak capability in using GSB to create social capital with suppliers. For example, SafeMed made the decision to partner with a Chinese and US R&D consultancy who "charged big fees" and "delayed" their NVI. Findings show the INV had become increasingly impassive about interacting with these foreign suppliers, as they no longer had any trust in these ties, which meant these activities formed a network-delaying process that

inhibited their NVI. These findings then support the limited IE literature and wider entrepreneurship literature that investigates how technology start-ups identify, select, and form suitable strategic alliances. For example, Baum et al. (2000) empirically found when biotechnology start-ups search for R&D partners and form alliances with potential rivals, on average, these technology start-ups tended to experience weaker performance. Fontes and Coombs (1997) also found Portuguese technology start-ups performed various search activities but did not have the sufficient "technological scanning" capabilities to identify suitable R&D partners who could support NVI.

These findings also correspond with Burgal and Murray's (2000) survey based research who empirically found that technology start-ups who are able to identify and evaluate suitable intermediaries are more likely to enable NVI. Specifically, Burgal and Murray (2000) found when technology start-ups target intermediaries such as foreign agents and distributors by promoting their unique complementary products they were more likely to form long-standing alliances. Relatedly Hallen (2008) reports technology start-ups that establish their initial network positions through "organisational accomplishments" are more likely to extend investor ties. That is, Hallen (2008) empirically found organisational accomplishments allow technology start-ups to convert the actions of their founders (e.g. granting of patents, the development of the right products) into valuable firm-level social capital. Based on these findings, this leads to the researcher's fourth proposition:

> *P4: Technology start-ups that use global search bridging before they accumulate unique resources are more likely to engage in impassive bonding that (a) forms a network-delaying process, which (b) inhibits new venture internationalisation.*

Despite this network-delaying process, there is evidence that when INVs are "learning from delays" this can trigger a virtuous cycle of networking capability development. More specifically, findings show the network-delaying process is an organisational learning mechanism that underpins networking capability development. That is, findings show all of the INVs learned from previous delays, which encouraged them to modify their existing social capital. For example, after FemMed's unsuccessful experience with the large US distributor, there is evidence they had learned from this delay as this experience motivated them to modify this social capital and internalise their sales and marketing through the formation of a US foreign sales subsidiary. Whereas, after SafeMed's unsuccessful

experience in attempting to collaborate with US and Chinese R&D consultancies, they eventually learned that these "delays" as the TMT realised they could internalise their R&D.

These findings support existing research that INVs networking capabilities develop and emerge through organisational learning (Fernhaber and McDougall, 2005; Mort and Weerawardena, 2006; Tolstoy and Agndal, 2010). Given the continued debate on whether dynamic capability development is idiosyncratic (e.g. Teece et al. 1997) or exhibits commonalities (e.g. Eisenhardt and Martin, 2000), the above findings indicate that learning from delays is a specific learning mechanism with respect to networking capability development. Consequently, these findings support Mort and Weerawardena's (2006) argument that Eisenhardt and Martin's (2000) learning mechanisms underpin networking capability development in NVI. That is, this study found strong evidence that network delays meant INVs were learning from mistakes and organisational crises, which motivate the need to build a networking capability in order to modify social capital. Therefore, based on this argument, this leads to the researcher's fifth proposition:

> *P5: When technology start-ups are learning from delays this is likely to (a) trigger a network-modifying process that helps (b) build a networking capability, which (c) enables new venture internationalisation.*

9.2.3 Aggregate Category 3: Network-Modifying Process

A critical mechanism of how technology start-ups build dynamic capabilities in networking is what the researcher terms as the *network-modifying process*, which is when the focal actor engages in networking activities that "modify" its social capital. Figure 9-1 depicts this network-modifying process, which is the third element that underpins this process theory of networking capability development. Interestingly, findings show three central networking activities underpin the network-modifying process. That is, findings show ETS, PTS and RTS underpin the network-modifying process. The researcher defines ETS as when the ego decides to retrench a weak tie, while he defines PTS as when the ego decides to retrench a strong tie, and defines RTS as when the ego decides to redeploy a strong tie for a new purpose. Interestingly, findings show these networking activities have varied functions, but as a combined network-modifying process, create new or accelerate existing network-

enhancing process, which together form a virtuous cycle of networking capability development.

Interestingly, findings show when INVs use ETS and PTS as a network-modifying process this cycle is likely to encourage "aspirations to internalise" that shifts the reliance from impersonal "arms-length" relations towards future aspirations to internalise operations. For example, Fertility used ETS to modify social capital with an English manufacturer due to continuous quality problems that delayed their NVI. After Fertility retrenched this tie, this encouraged them to internalise production to gain more control over the manufacturing process. When Fertility began to grow, findings then show they used PTS to retrench social capital with local mentors who could no longer advise on their international expansion. These events then created a network-enhancing process as Fertility invested in core ties who could support their NVI. Similarly, after HeartBeat used ETS to retrench social capital with a US VC syndicate, they then used what technology entrepreneurs describe as a "pivoting strategy" (e.g. Blank, 2013) to generate early sales revenues. That is, they deviated from their initial commercialisation (e.g. a class two medical device) and leveraged their unique technology to launch a quick and cost efficient product for the research market. When HeartBeat began to grow, findings show they used PTS to retrench existing social capital with a local manufacturer who no longer had the production capacity to manufacture their products. This then created a network-enhancing process, as HeartBeat were then able to invest in a core tie who could support their NVI.

These findings contribute to recent IE and entrepreneurship research that examines the "dark-side" of social capital (Maurer and Ebers, 2006; Prashantham and Dhanaraj, 2010; Yu et al. 2011). That is, these studies indicate most research takes an overly positive view on the influence social capital has on technology new venture growth and development. However, the researcher's findings provide evidence that INVs can engage in ETS or PTS to modify social capital before it becomes a liability. For example, these findings contributes to Prashantham and Dhanaraj (2010) argument that "network learning" is one network process that overcomes inertia such as "tie decay" and "tie obsolescence" which facilitates greater NVI. Therefore, the researcher's findings on future aspirations to internalise contribute to Maurer and Ebers (2006) revelations that biotechnology start-ups adapt the configuration of their social capital to changing resource needs, and when inertia turns a

firm's social capital into a liability. Specifically, Maurer and Ebers (2006) argue biotechnology start-ups use "horizontal and vertical differentiation" along with "integration of relationship management" as a "unique" network processes to overcome relational and cognitive lock-in in entrepreneurial networks. However, this study advances this existing research, as it identifies ETS and PTS as specific networking activities that modify weak or strong ties. Therefore, based on these findings, this leads to the researcher's sixth proposition:

> *P6: Technology start-ups who aspire to internalise operations are more likely to use eliminating and prioritising ties as a network-modifying process to (a) create new network-enhancing processes that (b) enables new venture internationalisation.*

Findings also show the second cycle of the network-modifying process is when INVs use RTS to redeploy their social capital. That is, there is strong evidence when INVs use RTS they are likely to engage in "nurturing core ties" which involves cherishing the most valuable stocks of social capital. Consequently, there is strong evidence this network-modifying process can accelerate the network-enhancing process, which enables NVI. For example, three (e.g. Fertility, HeartBeat and FemMed) of the four INVs used RTS to redeploy their mentor, investor, buyer, or supplier social capital. That is, both HeartBeat and FemMed used RTS to redeploy their mentor ties with US based surgeons. In both cases, the INVs initially used AB to strengthen these inter-personal relations. However, after critical events (e.g. surviving the financial crisis and establishing a US sales subsidiary) both firms used ETS and PTS to retrench what Prashantham and Dhanaraj (2010) would term "obsolete" social capital and focus on what the researcher would term as nurturing these core ties. Consequently, the INVs then used RTS to redeploy these core ties as both surgeons agreed to become KOLs, which accelerated the future network-enhancing process and enabled NVI.

Interestingly, both Fertility and HeartBeat also used RTS to redeploy their inter-organisational social capital. Although there is stronger evidence of this network-modifying process enhancing inter-personal social capital, there are instances were firms redeploy buyer or supplier social capital. For example, Fertility were able to reconfigure their buyer social capital due to the Canadian distributor emotional connection as they "loved their product" and would "do anything it takes to sell it." Consequently, Fertility were able to encourage the distributor to invest in the business, which meant they agreed to finance the

Canadian regulatory approval and the production process. HeartBeat's founders were also able to use their long-standing inter-personal connection with a Chinese VP to form a strategic alliance with a Hong Kong manufacturer. However, since the founders had an established relation with this individual, they were able to redeploy this tie with the supplier, as the Hong Kong manufacturer agreed to finance production and distribute their products throughout Hong Kong and mainland China. Consequently, nurturing core ties helped accelerate the network-enhancing process as their subsequent bonding with the manufacturer enabled their NVI.

One interpretation of these findings is that RTS is a networking activity that helps create "fungible" social capital for an alternative use at a lower cost (e.g. Eisenhardt and Martin, 2000; Sapienza et al. 2006). The fungibility of social capital is an important finding as it contributes to the limited conceptual (e.g. Larson and Starr, 1993; Hite and Hesterly, 2001; Slotte-Kock and Coviello, 2010) and empirical (e.g. Schutjens and Stam, 2003; Batjargal, 2003; Steier and Greenwood, 2000; Newbert et al. 2013) entrepreneurship research on the evolution of entrepreneurial networks. For example, Hite and Hesterly (2001) argue new ventures begin with "identity-based" networks and move towards "calculative-based" networks as they adapt to changing resource needs and resource challenges. That is, Hite and Hesterly (2001) argue new venture networks primarily consist of dense socially embedded ties, but as the new venture grows, they will begin to calculate the costs and benefits of forming sparsely related arms-length ties. However, despite this seminal theory, the researcher found evidence that young technology start-ups show signs of networking capability development *when* they actually reduce the size of their entrepreneurial network in order to leverage the fungibility of their social capital by nurturing core ties.

Indeed, these findings resonate with recent empirical research on the calculative nature of emerging entrepreneurial networks (e.g. Ozcan and Eisenhardt, 2009; Hallen and Eisenhardt, 2012; Sepulveda and Gabrielsson, 2013). For instance, Ozcan and Eisenhardt (2009) found executives in technology start-ups with high-performing portfolios visualise their alliance portfolios in the context of an entire network, but not as a series of single ties. That is, Ozcan and Eisenhardt (2009: 269-270) propose when technology start-ups (1) advocate a vision of the embryonic industry architecture, (2) synchronise multiple exchange partnerships and (3) exploit industry uncertainties, they are more likely to form high-performing alliance

portfolios and achieve superior performance. Their core argument is technology start-ups who achieve high-performing alliance portfolios create strong collaborations between a small cohesive team of diverse partners, rather than forming a sparse network of arm's-length ties. Therefore, Ozcan and Eisenhardt (2009: 268) argue this cognitive view of nurturing industry networks broadens the range of strategic alternatives from which entrepreneurs can choose and enrich their strategic possibilities.

These findings also correspond with Baum et al. (2000) who report biotechnology start-ups that understand and envision the composition of their alliance network are more likely to avoid inter-partner conflict and rivalry between partners. Stuart (2000) reports empirical evidence that industry analysts were found to look unfavourably at technology start-ups who form extensive, inefficient webs of alliances comprised of multiple and duplicate partners. Therefore, the researcher would argue to improve relational quality (e.g. Yli-Renko et al. 2001) involvement in cycles of nurturing core ties is a more valuable activity for technology start-ups than simply increasing network size. Based on these findings, this leads to the researcher's seventh proposition:

> *P7: Technology start-ups that nurture core ties are more likely to use reconfiguring ties as network-modifying process, which (a) accelerates network-enhancing processes, and (b) enables new venture internationalisation.*

Finally, an overarching revelation from this study is that networking capability development is not a calculated or intentional behaviour, but an affect-based emergent process. More interestingly, findings show the extension of inter-personal ties – particularly through cycles of nurturing core ties – can help initiate the formation of future exchange partnerships. Thus, findings indicate networking capability development shifts the reliance from impersonal-based relations to the nurturing of core ties that motivates and supports the firm to internalise its operations. Moreover, these findings indicate networking capability *development* is not driven by an increase in network size (e.g. arm's length-ties), but by overcoming impassiveness and striving for affinity, which motivates future aspirations to internalise operations.

Vissa's recent entrepreneurship research on the value of inter-personal ties supports these arguments (Vissa and Chacar, 2009; Vissa, 2011; Vissa, 2012; Vissa and Bhagavatula,

2012). For example, Vissa and Chacar (2009) empirically found when the "advice networks" of technology start-ups have a (1) strategic consensus on key goals and strategies, and have a (2) internal cohesion in terms of inter-personal friendships, they are more likely to experience higher performance. Vissa (2011) also reports that Indian entrepreneurs who co-found technology start-ups are more likely to secure exchange partnerships when the co-founders are friends and share an ethnic caste, language, and have greater task complementarity.

In addition to these findings, Vissa and Bhagavatula (2012: 273) argue that technology entrepreneurs engage in "network-broadening" and "network-deepening" to secure exchange partners. Vissa and Bhagavatula (2012) argue when entrepreneurs encounter change in their personal network – this is likely to lead to a growth in the focal venture's portfolio of exchange partners. Therefore, the researcher's findings on the network-enhancing, network-delaying, and network-modifying processes contribute to this existing research. However, the major distinction between these concepts is this research provides a more fine-grained interpretation of the various networking activities that underpin these network-processes. Moreover, Figure 9-1 depicts that networking capability development occurs through affect-based (e.g. Barron, 2008) emergent process (e.g. Covin et al. 2006; Shah and Tripsas, 2007) which enables sustained NVI. Therefore, based on these findings, this leads to researcher's eighth proposition:

> *P8: Technology start-ups involved in affect-based and emergent cycles of networking capability development are more likely to (a) learn from delays, (b) nurture core ties, and (c) aspire to internalise operations, which (d) enables new venture internationalisation.*

9.3 Implications for Public Policy and Practice

This study has several implications for public policy and practice. The major implication stems from the connection between specific networking activities and outcomes, which in this study's case is NVI. Namely, this study identifies and describes eleven distinct networking activities, which provides guidance on *how* and *when* entrepreneurs should perform these activities. Since "networking" is an elusive term, this thesis contributes to policy and practice by providing a more fine-grained interpretation on what this behaviour entails within the context of high-growth entrepreneurship.

Firstly, this study's discussion on the network-enhancing process may be particularly valuable for entrepreneurs in situations when they need to create early stage unique resources. Central to the network-enhancing process is AB, which is about striking an intellectual, cultural, or empathic interpersonal connection with a new tie. In most cases, these core ties are mentors, such as experienced entrepreneurs, business advisors, and scientific or medical professionals. Thus, they are "socially embedded ties" (Uzzi, 1997) who care more about their relationship with individual entrepreneurs than the performance of their ventures. In line with Vissa (2011, 2012), when technology start-ups use the network-enhancing process to strengthen these inter-personal ties, they are likely to have a major influence on the new ventures growth and development.

One example is when the medical technology start-ups formed inter-personal ties with US based KOLs. Stremersch and Van Dyck (2009) note KOLs are practicing surgeons who are major marketing authorities as they can endorse and promote a firm's products. Therefore, findings show these core ties had an instrumental involvement in the business as they provided the firm with legitimacy and access to US based marketing channels. However, findings show only three of the original eight case firms had formed inter-personal relationships with KOLs. Therefore, non US-based medical technology start-ups who intend to enter the US medical technology industry need to be more aware of the benefits of creating and strengthening ties with KOLs. Consequently, this research indicates that the network-enhancing process is one mechanism to help form and strengthen such ties. Moreover, these findings indicate that policy makers in both the UK and Australia need to provide additional support mechanisms on how to identify and attract these critical success contacts. These support mechanisms might include government workshops with invited speakers, government sponsored trade delegations, or domestic trade summits where US-based KOLs have the opportunity to meet medical technology start-ups in their home territory.

A second implication for policy and practice is discussion on the network-delaying process, which may be of particular interest to executives of technology start-ups who want to overcome, mitigate the risk, or avoid delays that are inevitable with commercialisation in a global context. Mehta (2008) notes legal, regulatory, production, and sales delays are inevitable forces in the commercialisation of successful biomedical technologies. Pisano and Verganti (2008) also note since innovators need to commercialise their technology within

networks, they must leverage their network position to avoid competency traps by choosing the "right type" of collaboration. However, findings show all of the technology start-ups became entrenched in the network-delaying process at some point in their development. These findings have important implications for technology entrepreneurs as they provide signals about the barriers that might delay their growth and development.

Central to the network-delaying process is IBG, which is when a firm commits a large resource to a tie, but then limits interaction following an unsuccessful collaboration. Findings show firms became involved in the network-delaying process when they collaborated with the wrong partners. That is, when technology start-ups lack experience in specific bonding and bridging activities, they had a tendency to engage in IBG, which inhibits their NVI. Moreover, this was most common when technology start-ups attempted to create foreign exchange partnerships *before* they accumulate unique resources, which entrench them in network-delaying process. Findings also indicate technology start-ups are likely to avoid the network-delaying process when they use GRB *before* they accumulate unique resources, or when they use GSB *after* they accumulate unique resources. These preliminary findings indicate the *timing* of tie formation is critical, since owning unique resources such as a granted patent or unique product range help increase bargaining power and improve network position. These findings compliment Hallen and Eisenhardt's (2012) recent research on "timing around proof points" which recommends technology start-ups should accelerate, pre-empt, or delay tie formation based on organisational accomplishments.

Therefore, an important implication for policy makers is these findings indicate some medical technology start-ups rely too heavily on local government agencies to help with GRB *before* they were in a strategic position to form such ties. That is, some medical technology firms were encouraged to form ties with large MNEs *before* they owned unique resources, which over the long-term, delayed their NVI. Ironically, in the Scottish context, findings show medical technology start-ups relied too heavily on global referrals, due to the pressures to internationalise their operations due to the lack of collaboration opportunities with institutions such as the National Health Service (NHS). Despite the NHS being the

world's single largest purchaser of medical technology (MHRA, 2014[9]), the researcher found an increasing frustration within the local life sciences community that firms were unable to collaborate or sell to the NHS. Consequently, such policy has meant local medical technology start-ups have no choice but to internationalise. Indeed, in the researcher's sample, the US was the initial core target market and given these high barriers to entry, the researcher would assume these local and global challenges would continue to stifle new venture creation and have negative influence on existing survival rates. Thus, these findings indicate the Scottish and UK government need to adjust policy to facilitate innovation, entrepreneurship, and collaboration with local institutions such as the NHS.

A third implication for policy and practice is discussion on the network-modifying process, which may be of particular interest to technology entrepreneurs who seek to increase the value of their social capital. Central to the network-modifying process is eliminating, prioritising, and reconfiguring ties. The above findings show firms use ETS or PTS to overcome the network-delaying process, while they use RTS to accelerate the network-enhancing process. These findings have implications for entrepreneurs as they provide insight into preventing social capital turning into liability. For example, findings show RTS is one activity that helps redeploy existing social capital for an alternative use at a lower cost. Crucial to this network-modifying process is nurturing core ties, as these ties pay dividends due to their versatile and long-term involvement in NVI. These findings then provide entrepreneurs with guidance on the importance of nurturing core ties, rather than simply increasing the overall size of their ventures network.

Finally, policy makers should create support mechanisms to help entrepreneurs nurture these core ties. For example, findings show an overwhelming support for the SCF, which is a partnership between Scottish Enterprise and local BAS. Interestingly, all of the case firms who approached VCs had negative experiences as they inhibited their NVI. Whereas, there was strong support for the SCF as this policy enables BAS' to commit more resource to technology start-ups over the long-term. Consequently, one example shows the technology start-up was able to reconfigure ties with their BAS, as they became "friends" who provided finance, international business, and emotional support. Interestingly, state funded co-

[9] MHRA. (2014). *Medicines and Healthcare Products Regulatory Agency.* Available: http://www.mhra.gov.uk/index.htm#page=DynamicListMedicines Last accessed 23/03/2014.

investment funds are rare as limited examples include the New Zealand Co-Investment, London Seed Capital Fund, and Germany's *Technologie-Beteiligungs-Gesellschaft mbH* (Paul and Whittam, 2010). Relatedly, in a recent interview with the founder of a Scottish BAS, the respondent confirmed foreign investors now recognise the SCF as the most developed state funded co-investment in the world [FER-O11-A].

However, Vitale et al. (2006) report the business angel market in Australia is still underdeveloped as Federal and State Governments have yet to implement such policies. This study's findings also show that Australian firms struggled to raise start-up capital and in some cases had no belief in raising state funded grants or equity based finance. Thus, these findings have implications for Australian policy makers as regions such as South East Queensland who have a similar population and knowledge base to Scotland or New Zealand are likely to benefit from replicating this funding model. Since the Queensland Government replicates their policy on existing UK based initiatives such as SMART awards, and due to growing demand for local BASs, it is likely that Australia has a similar policy infrastructure in place to replicate a similar investment model. Therefore, such a policy initiative would move towards supporting technology start-ups nurture core ties, which would support networking capability development.

9.4 Limitations and Implications for Future Research

As with all exploratory research this study is not without limitations, meaning further research is required to establish the generalizability of the researcher's findings. Despite some limitations, this study makes three overarching contributions to knowledge that raises important questions for future research on networking capability development. The primary contribution of this thesis makes an important step towards a process theory of networking capability development. On this journey, the researcher achieved three objectives that contribute to the IE, entrepreneurship, and wider strategic management literature.

Firstly, this study explored ***how*** INVs create, extend, or modify their social capital in high-technology markets. To begin with, this research contributes to the entrepreneurship and wider strategic management literature by using Helfat et al. (2007) asset orchestration framework with Nahapiet and Ghoshal's (1998) conceptualisation of social capital as a

combined theoretical lens (e.g. Okhuysen and Bonardi, 2011). That is the researcher uses Helfat et al. (2007) and Nahapiet and Ghoshal (1998) to conceptualise networking capability as one particular type of dynamic capability. To the best of the researcher's knowledge, this is the first study to combine these theoretical lenses, as a framework to guide this research.

Therefore, by using this lens, a second contribution to emerge from this first research objective was the researcher discovered INVs engage in eleven distinct networking activities that create, extend, or modify their social capital. Consequently, the identification of these distinct networking activities is an important contribution as it helps unlock the black box of networking in the entrepreneurship (e.g. Soh, 2003; Watson, 2007) and wider social capital (e.g. Seibert et al. 2001; McFadyen et al. 2004) research. For example, network scholars have traditionally assumed that bridging and bonding are general networking activities that help accumulate social capital (e.g. Gittell and Vidal, 1998; Leonard, 2004). Nevertheless, this research moves toward identifying specific types of bridging and bonding activities that unfold over time with respect to *how* focal actor's accumulate social capital.

However, a potential limitation of these findings was the egocentric nature of this research. That is, the researcher collected data with one entrepreneur per firm, rather than depth-interviews with multiple informants, which is often recommend for case study research. This was due to time, resource, and access limitations that would emerge from collecting longitudinal data from multiple respondents. Consequently, to mitigate the risk of researcher bias, the researcher followed a strict protocol to ensure the methodological rigour of this multiple-case research. Firstly, the researcher followed guidance from entrepreneurship research that during firm emergence, the network of the individual entrepreneur is virtually synonymous with the new venture's network (e.g. Hite and Hesterly, 2001). Moreover, Hite and Hesterly (2001: 279) argue in most new ventures, two or more individuals co-found the firm, which means their existing networks form the new venture network. Therefore, Coviello (2006) argues the "entrepreneur" as the core respondent, is a reliable source to pursue network-based research, as this individual has an overarching knowledge of the network relationships that form a new venture's network.

Thus, the researcher made the decision that an individual entrepreneur within the TMT was the most valuable informant to collect data on specific network relationships due to their

direct involvement in NVI. However, to increase the validity of this research, the researcher collected multiple data sources such as archival data in form of internal and external press reports, monitored each firm's website, and conducted unstructured interviews with local industry experts to triangulate this data collection. Additionally, the regular maintenance of a case study database (e.g. Appendix 3) helped ensure the reliability of these findings. Nevertheless, despite these protocols the researcher acknowledges the value of using multiple informants in network-based research. Incidentally, one lucrative avenue for future research is an exploration of the dyadic nature of network relationships (e.g. Dyer and Singh, 1998; Newey and Zahra, 2009). That is, to improve the validity of these findings, future research should explore the ego and alter's perspective on the creation, extension and modification of social capital. Therefore, since social capital is a shared asset (e.g. Anderson and Jack, 2002) it would seem more qualitative dyadic research is needed to understand the content and context of tie formation.

Secondly, this study examined ***why*** specific networking activities enable or inhibit NVI in high-technology markets. Miles and Huberman (1994) recommend that qualitative researchers should move beyond exploring and describing and move towards ordering and explaining why a phenomenon influences a particular outcome. Thus, the third contribution was that the researcher moved beyond exploring and describing *how* these various networking activities unfold, by ordering and explaining *why* these specific activities influence NVI. More specifically, these findings contribute to IE research as they identify that specific networking activities such as AB enable NVI, while networking activities such as IBG inhibit NVI. Findings also indicate the firm's strength to practice specific networking activities such as GRB or DB determines whether they enable or inhibit NVI.

Again, there are limitations to these findings. Firstly, the researcher's decision to select a theoretical sample of four cases is at the lower end of what most case study researchers would recommend as a valid sample (Eisenhardt, 1989; Miles and Huberman, 1994; Yin, 2003). However, in following a similar design to that of Maurer and Ebers (2006), the researcher does not aim to *predict* the effects of these emergent networking activities, but rather understand the *influence* of these activities within a specific context, which in this case is NVI. Therefore, to ensure the internal validity of these findings, the researcher followed Yin's (2003) recommendations and used Figure 5-3 as a theoretical framework to analyse

and interpret these data. Subsequently, the researcher followed Eisenhardt's (1989) guidance and used "pattern matching" as a technique by "unfold" these findings with those published in existing literature. However, despite such protocols, and the aim to interpret rich data, future research needs to establish the generalizability of these findings.

Therefore, the identification and influence of specific networking activities opens a new avenue for future research. For example, more qualitative research needs to use Helfat et al. (2007) asset orchestration framework as a lens to explore how firms create, extend, and modify their social capital. That is, future qualitative research would be useful to explore networking capability development within a variety of empirical contexts within both new ventures and established firms. This research can then confirm, identify new or raise potentially conflicting interpretations on the influence specific networking activities have on various directions (e.g. market penetration, internationalisation, NPD) or methods (e.g. organic, acquisitions, alliances) of growth. Moreover, an interesting avenue for future research would be to operationalise the various networking activities highlighted in this study by using survey-based research to test their effect on NVI. The researcher attempts to define these networking activities, but now quantitative research is needed to build scales that can measure these networking activities within a larger sample of firms to confirm the generalizability of these findings.

Thirdly, this study determined ***which*** network processes underpin networking capability development in NVI. This is the primary and fourth contribution to emerge from this research, as this third research objective takes an important step towards a process theory of networking capability development. Specifically, Figure 6-2 illustrates three overarching dimensions – e.g. (1) network-enhancing process, (2) network-delaying process, and (3) network-modifying process – aggregate eleven second-order themes (e.g. the above networking activities), which aggregate several first concepts. Therefore, this abductive research contributes to the entrepreneurship and wider strategic management research by providing a process model on how technology-based firms build dynamic capabilities in networking to enable various forms of growth.

One possible limitation of this emergent process theory is that the empirical context of young technology-based firms limits its wider application. Moreover, Figure 9-1 proposes these

various activities, processes, and cycles are the underpinnings of networking capability development. Central to this model is networking capability is an affect-based emergent process that enables NVI. Given the abductive nature of this research, this theory contributes to recent research on how entrepreneurs "create something from nothing" (e.g. Baker and Nelson, 2005; Zott and Huy, 2007). One avenue for future research should therefore question whether there are different types of networking capabilities for different purposes. For example, a networking capability needed to create a license agreement is likely to differ from a networking capability to manage a co-development agreement. Thus, an interesting research question would be to consider which types of networking capabilities help perform various cross-border activities. Additionally, building a networking capability at the start-up phase is likely to differ from networking capability development at the growth phase. Therefore, in line with McKelvie and Wiklund (2010), it would appear networking capabilities that influence organic growth are likely to differ from methods such as acquisitive growth.

Finally, a fascinating direction for future research would be to build on Baron's (1998; 2004; 2008) existing research that feelings and moods that individuals experience (i.e. their affect) will influence many aspects of entrepreneurs' cognition and behaviour. Consequently, this study's emergent findings show compelling evidence that networking capability *development* is an affect-based emergent process that enables NVI. Thus, technology start-ups might be able to build a networking capability through various networking activities, but cycles of networking capability *development* appears to be an affect-based emergent process. An interesting avenue for future research could therefore explore *how* technology entrepreneurs' positive or negative affect (Baron, 2008) influence tie formation and the nurturing of core ties. Further empirical research should also examine the finding that nurturing core ties helps shift technology start-ups reliance from impersonal relations to future aspirations about internalising their operations.

9.5 Concluding Remarks

In summary, this study has explored how technology start-ups build dynamic capabilities in networking to enable NVI. Through longitudinal case study research, the primary contribution of this thesis takes a step towards a process theory of networking capability

development. This chapter reports on how the researcher arrived at his thesis that ***networking capability development is an affect-based emergent process that enables NVI***. This chapter then discussed the core findings in relation to existing literature, which internally validates this study's three overarching contributions to knowledge. Firstly, the researcher combined dynamic capabilities and social capital as a theoretical lens to conceptualise networking capability. Secondly, the researcher used this theoretical lens, to induce specific networking activities from longitudinal data, which contributes to unlocking the black box of networking. Finally, the researcher built a process model from these abductive findings, which makes an important step towards a process theory of networking capability development. In addition, this thesis also reports on the implications for both policy-makers and practice. Overall, despite some limitations, the researcher believes this thesis is one-step on a journey towards exploring the role entrepreneurial affect might have in sustaining what could be termed as interpersonal competitive advantage.

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Appendix 1: Consent Form

Consent to Participate in Academic Research

Research Project:

Preliminary Research on Resources, Dynamic Capabilities and Path Dependence in Life Science Firms

New technology based ventures face the dual problems of markets which are driven by global forces, and growth challenges associated with them being new and small. This study is concerned with how firms leverage resources internally and externally to develop capabilities and competencies that will support growth and sustainable competitiveness in domestic and international markets. The purpose of this research is academic, within the discipline of business and management. The aim to advance knowledge on business practice and theory. The study has received ethical approval as detailed in the university's principles of ethical research (attached). The identities of respondents and firms will not be revealed in published research reports without the express prior permission of the firms concerned. On completion of the study, all respondents are welcome to request a copy of the research report.

Contact Details of Researcher
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Consent to Participate in Academic Research

I: (name) _____

Of (address): _____

_____

_____

_____

Post Code: _____

Telephone: _____

Email: _____

(This information is only needed to obtain consent to the research and will not be used in any results or publications resulting from this research)

The researcher have drawn my attention to the attached Principles of Ethical Research and agree to participate in the under noted research:

Title:	**Preliminary Research on Resources, Dynamic Capabilities and Path Dependence in Life Science Firms**
in which the researcher is named:	Karl S.R Warner
supervised by:	Prof. Marian V Jones
Tel:	+44 (0) 141 330 3316/4066
UQ Supervisor	Prof. Peter Liesch
Tel	+61 (0) 7 3346 8174

I understand that I have the right to refuse to continue to support the research at any stage, and to require the return and no subsequent use of any data provided, and that special issues of confidentiality or the like listed below will be subject to agreement between myself and the department before any research begins.

Signed:…….

Date:…….

If you require further information about the research please contact the supervisor in the first instance. If there are any unresolved problems please call the Department and ask for the Chair of the Research Ethics Committee.

Principles of Ethical Research

1. In all forms of research conducted in the Department we will operate with as full a consideration as possible of the consequences of our work for society at large and groups within it.

2. We will handle all confidential information with appropriate levels of discretion and compliance with the law and with due diligence as to the security of that data. We will normally prevent the publication or use of data in any way that could compromise the subject's confidentiality or identity.

3. Any material being prepared for publication both inside and outside of examination purposes will be produced in such a way as to reduce the possibility of breaches of confidentiality and / or identification. If necessary, this process will be subject to a written statement as to agreed process between any sponsors of research, research subjects and the Department.

4. We will try to avoid overburdening subjects, causing them inconvenience and intruding into their private and personal domains.

5. Subjects will be informed as to the purpose and nature of any inquiry in which they are being asked to participate.

6. We will avoid misleading subjects or withholding material facts about the research of which they should be aware.

7. Where the research methodology allows for it, a research subject will be expected to be provided with a copy of these Statements of Principles along with a consent form which will also indicate a subject's right of referral and appeal to a higher authority in the Department and through Faculty to the University Ethics Committee.

8. Where the research methodology suggests that a different kind of consent is the only one possible this will be made clear in the ethical approval form but subjects will be referred to departmental web pages or made aware of these principles by the researcher in order to understand the issues as at paragraph 7 above.

9. All staff, researchers and their supervisors are required, before the project begins, to submit to the chair of the departmental ethics committee, either a short-form or a long form ethical approval form. Only on formal approval by the ethics committee will the project be permitted to begin.

10. In the situations listed in the following subsections, staff, researchers and their supervisors must produce a justified case using a standard Application Form for Ethical Approval.

a. When the research methods employed might be regarded by the lay public to have delicate or controversial elements or when the research might be considered to give rise to adverse publicity for the University.

b. When the research involves the use of individual medical records

c. Where there might be difficulties in obtaining the subject's informed consent. This to include but not be limited to the following examples: with vulnerable people, including children; and those with learning difficulties; when proposing to use covert observation; or when employing a methodology in which the practicalities of obtaining signed consent forms are infeasible.

Only if and when the Departmental or subsequently the Faculty Ethics Committee has approved the research can it commence.

11. All members of staff and all student at all levels are required to read and agree to comply with these statements and to operate them in the full spirit in which they are written. Failure to comply with these statements will be regarded as a disciplinary offence.

12. All researchers and all supervisory staff at all levels must sign an agreement on an annual basis, indicating their acceptance of these Principles.

Appendix 2: Semi structured interview guide

Preliminary Research on Resources, Dynamic Capabilities and Path Dependence in Life Science Firms

Professor Marian V Jones
Dr Anna Morgan-Thomas
Mr Karl Warner

Company Name:

Address:

Section A. Open Questions: The Firm's current position

Q. Please tell us about this firm. In your own words please describe your firm, the business it does, the nature of its products, its role within the industry, its core competencies and its competitiveness in domestic and any international markets?

Prompts (for guidance)	Please allow the respondent to answer in their own way, and record their responses in their own words
• **Core competence** - What is the basis of the firm's commercial existence • **Product nature –** Products manufacturing or production processes • **Industry** – Role within industry (identify the industry). • **Value Chain** – What is your position on the industry value chain? Suppliers, buyers, new entrants, substitute products, concentration. • **Customers** – Who and where are your customers? Domestic or international • **Competitive position** - market share, unique niche, etc. source of competitive advantage in domestic market and international markets	

Section A. Closed Questions: **The Firm's current position**

(Please ask questions and record answers precisely in this section)

A1. Business and Products

1.1 Would you classify your firm primarily as: **1.** a manufacturing firm _____ **2.** a firm producing services _____ **3.** an R&D laboratory_____ or **4.** other, please describe_____? (tick one)

1.2 What percentage of your firm's annual income comes from: 1. Sale of hardware products_____ %, 2. Sale of software products_____ %, 3. Sale of services_____ %, 4. Research grants_____ %, 5. Other _____% (check total = 100%)

1.3 What proportion of your firm's annual income comes from: 1. Business activities/ sources in the Australia _____%, 2. Business activities / sources overseas _____ % ? (check total = 100%)

1.4 What is your major product/service? _____ ?

1.5 Is your major product/service sold to: 1. consumer markets _____ , 2. organisational markets _____ 3. both _____ ?

1.6 Would you describe your product as: (tick all that apply)

- Having a narrow range of applications within one or a few industries / markets_____,
- Having a wide range of industry applications across a number of industries / markets_____
- Specific to a target group of customers with particular needs_____
- A niche product with local applicability (Australia) only)_____
- A niche product with global applicability (foreign markets) _____
- General to a wide range of industries / markets in Australia and abroad _____

1.7 Would you describe your major product as: (tick one only)

- Innovative, leading edge technology _____
- An incremental innovation of relatively new technology_____
- Other, please describe

  _____

1.7 Do you have a portfolio of products/services? 1. Yes _____, 2. No _____? (tick one)

1.8 Could any of your products be described as a Cash Cow? 1. Yes ____ 2. No ____ 3. Might be in the future _____ ?

A2. Industry Structure

2.1 Approximately how many **direct** competitors do you have in the Australia _____ ?

2.2 Are your main competitors large firms _____, or small firms _____ ?

2.3 If you have few competitors, can you identify them by name? _____?

2.4 If you have few competitors are these firms Australia owned _____, foreign owned _____, both _____ ?

2.5 How unique is your product or service _____ ?

2.6 How important is your product e.g. could customers use something else in its place _____? What _____ ?

A3. Competitive Advantage

3.1 Please describe the source of your competitive advantage in the Australia?

_____

_____

3.2 Please describe the source of your firm's competitive advantage in its overseas markets if any?

_____

Section B. Open Questions: The Firm's Foundation Process

Q.In your own words, please describe how your firm was founded, who was involved, how it was supported, why it was founded and the aspirations, aims and objectives of the founding members

Prompts (for guidance)	Please allow the respondent to answer in their own way, and record their responses in their own words
• **Foundation Reason** - Was there a particular reason for the firms foundation eg to exploit a new technology or innovation, or other? • **Pre-foundation history** - that influenced the establishment of this firm eg spin-out or spin-off, MBO etc.? Reasons? Opportunities or threats? • **Who were the founders** - describe, them, what role did they play in founding, what role do they play now? • **International connections & Growth** – What international connections did the firm, or its founders have at foundation and how did this contribute to growth? • **Resources at foundation** - How was the firm resourced at foundation (financial, physical resources, human resources). • **Resource accumulation** - Where did the resources come from, how did the firm go about getting them?	

Section B. Closed Questions: The Firm's Foundation Process

(Please ask questions and record answers precisely in this section)

1. In what year was the firm founded? _____

2. a). Was the firm founded specifically to develop a scientific/technological innovation? Yes_____(goto 2.1)
   b). Since founding, has your firm developed a scientific / technological innovation ? Yes_____(goto 2.1)
   (If no to both 2a and 2b, go to 3)

   2.1 Please describe that innovation

_____

_____

_____

   2.2 What was the source of the firm's **first** scientific/ technological innovation?

	Yes/No	**Source Country**
• In-house development	_____	_____
• University	_____	_____
• Other firm	_____	_____
• Previous employer	_____	_____
• Acquisition of patent rights from third party	_____	_____
• Other_____		

   2.3 Does the firm have intellectual property rights for that innovation here, and/or abroad? (note all countries and sequence in which IPRs were sought).

_____

_____

_____

2.4 Does the firm have FDA approval for the US Market? Yes _____ Date _____ No _____ Pending_____

3. Why was the firm founded?

_____

_____

4. How was the firm financed? (tick all that apply)
   - Research Grant _____
   - Enterprise / start-up funding from Government _____
   - Bank loan _____
   - Founder's personal sources _____
   - Angel/Venture Capital _____
   - Other _____

5. Was the firm founded as an independent new firm with no corporate history? Yes_____(go to 7), No _____ (go to 6)

6. Was the firm founded as: (tick one only)
   a. A spin-off from another firm _____
   b. A spin-off from a university _____
   c. Merger/takeover _____
   d. Management worker buy-out_____
   e. Other _____

7. How many founders were there? _____.

7.1.1 The table below relates to the human and social capital of the firm at founding. Please record relevant details on each of the founders.

	Founder 1	**Founder 2**	**Founder 3**	**Founder 4**	**Founder 5**
Age					
Gender					
Nationality					
Current role/position?					
Previous entrepreneur? Yes/No					
Family history of entrepreneurship Yes/No					
Highest Level of education, e.g School Cert, College degree/diploma (CD), University 1st Degree (UD), Advanced degree (AD), Doctoral degree (Dr), Professional bodies,					
Overseas education? Where ? Country (ies)					
Overseas working experience Where? Country (ies) SME/MNE? Role Position?					
Working experience in a Domestic internationalising firm?					
Foreign language ability? Languages? Spoken/written/fluent?					

Section C. Open Questions: Critical Events and Milestones (Timeline)

Q. Please tell us about the events in the history of the firm, that you see as major milestones, or critical incidents which have triggered change internally or externally, during the firm's development process?

Section C. Open Questions: Prompts Relating to Events on the Firm's Timeline

Q. Please allow the respondent to discuss each event as fully as possible. The prompts relate to each relevant event

Prompts (for guidance)	Please allow the respondent to answer in their own way, and record their responses in their own words
• **What triggered each event**? • **Critical events trigger new routines or strategies** - Towards R&D, manufacture, marketing, distribution, new product development, commercialisation, funding etc. • **Revenues** – How did critical events impact on profitability, financing, sales, revenues etc? Was there need for cut-backs? • **New networks -** emerge from this event? • **Entry modes**- Did any critical events impact on the entry mode choice (export, licensing in or out of technology, FDI) • **International Motivations -** What were the motivations for international events? Increase knowledge, expand sales, exploit opportunities, avoid unfavourable conditions in home country? • **Learning** - What did the firm learn from any of the international events? • **Path dependencies** – Have there been any long effects (good or bad) as consequence of any critical events mentioned?	

Section D. Open Questions: The Value of Networking, Partnerships & Alliances

Q. Please tell us about your involvement in networks/ partnerships and alliances with other firms/ individuals / institutions / other and how they have influenced the growth of the firm?

Prompts (for guidance)	Please allow the respondent to answer in their own way, and record their responses in their own words
• **Inception of firm** - What types of networks (business and social) were you involved in before the inception of the firm? • **Resource Base** - How has networks improved the firm' resource base (tangible & intangible). • **Importance** – Which networks are most important and why? • **Difficulties** – What difficulties have you encountered when trying to enter a new network? • **Example of change** - needing to change the firm's relationship within a network, partnership or alliance to work towards future aims of the firm? • **Location –** On what location (local, national, international) are personal and business networks being built • **Strategy** – Do you have a strategy to build networks? • **Network rigidity** – Can you give an example when a network/partnership held the company back • **Routines** – What are the day to day tasks when dealing with networks or partnerships?	

Section E. Closed Questions Only (Please ask questions and record answers precisely in this section)

F.1 Strategy and Planning

1.1 Would you describe your firm's development as: (tick one only)

1. Organic (evolutionary process in response to events and triggers) _____
2. Strategic (develops according to our pre-determined plans)_____
3. A combination of 1. and 2. _____

1.2 Does your firm have a formal, written strategic plan? Yes / No.

1.3 If yes, does that plan make explicit reference aims and objectives relating to your firm's involvement or future involvement in international business activity? Yes / No.

1.4 If yes, does that plan contain explicit targets for Research and Development? Yes / No . For 1year, 2 years, 3 years, 4 years, 5years, over 5 years?

1.5 If yes, does that plan make explicit reference to: (Yes/No)

1. Product portfolio planning _____
2. New product / service development_____,
3. Adaptation of products for foreign markets _____,
4. Entry into new foreign markets_____
5. Withdrawal from any current international business activities _____
6. Cessation of R&D _____

.2 Firm Performance and Projections

2.1 How would you rate the performance of this firm in its first five years, on a scale of 1-10, with 1 being unsuccessful, 10 being successful?

Unsuccessful 1 2 3 4 5 6 7 8 9 10 Successful

2.2 Was the firm profitable in the each of the first five years?

Year 1 Y/N Year 2 Y/N Year 3 Y/N Year 4 Y/N Year 5 Y/N

2.3 What percentage of the firm's revenue was derived from overseas in each of the first five years?

Year 1 _____% Year 2 _____% Year 3 _____% Year 4 _____% Year 5 _____%

2.4 What is your firm's current percentage of profits is derived from foreign operations? ___ _____% of total profits?

2.5 What is your firm's current percentage of sales is derived from foreign operations? _____% of total sales?

2.6 Would you mind telling us the approximate total sales of your firm in the last financial year £_____ ?

2.7 Would you mind telling us the profitability of your firm in the last financial year as a percentage of total sales_____ %
2.8 How many staff (FTEs), including working directors does your firm currently employ_____
2.9
Thank You for Your Participation

Appendix 3: Case Study Database Example

Fertility Ltd – Case Study Database

Data Code	Data Source
Interviews	
Interview 1 (2008)	
FER-I08-A	A - The Firms Current Position
FER-I08-A1	A1 Business and Products
FER-I08-A1.1	A1.1 Classifcation
FER-I08-A1.2	A1.2 Percentage of annual income
FER-I08-A1.3	A1.3 Percentage of international revenues
FER-I08-A1.4	A1.4 Major product or service description
FER-I08-A1.5	A1.5 Product or service market
FER-I08-A1.6	A1.6 Product applicability
FER-I08-A1.7	A1.7 Product innovation
FER-I08-A1.8	A1.8 Product portfolio
FER-I08-A1.9	A1.9 Cash cow
FER-I08-A2.1	A2.1 Direct competitors
FER-I08-A2.2	A2.2 Size of competitors
FER-I08-A2.3	A2.3 Name competitors
FER-I08-A2.4	A2.4 Competitors location
FER-I08-A2.5	A2.5 Uniqueness of product
FER-I08-A2.6	A2.6 Product substitutes
FER-I08-A3.1	A3.1 Competitive Advantage
FER-I08-B	D - The Firms Foundation Process
FER-I08-B1.1	D1.1 Firms foundation
FER-I08-B2.1	D2.1 Reasoning for foundation

FER-I08-B2.2	D2.2 Source of innovation
FER-I08-B2.3	D2.3 Intellectual property rights
FER-I08-B2.4	D2.4 FDA approval
FER-I08-B3.1	D3.1 Why firm founded
FER-I08-B4.1	D4.1 How firm was financed
FER-I08-B5.1	D5.1 Independent or corporate history
FER-I08-B6.1	D.6.1 Foundation details
FER-I08-B7.1	D7.1 Number of founders
FER-I08-B8.1	D.8.1 Social capital
FER-I08-B9.1	D9.1 Network relationships
FER-I08-B10	D10 Human and social capital
FER-I08-C	C - The Value of Networking and Partnering
FER-I08-D	D - Critical Events and Milestones
FER-I08-E	E - Strategy and Planning
FER-I08-E1.1	E1.1 Firms development
FER-I08-E1.2	E1.2 Strategic planning
FER-I08-E1.3	E1.3 Aims and objectives
FER-I08-E1.4	E1.4 R&D targets
FER-I08-E1.5	E1.5 R&D specifics
FER-I08-F	F - Firm Performance and projections
FER-I08-F1.1	F1.1 Performance rating
FER-I08-F1.2	F1.2 Profitability
FER-I08-F1.3	F1.3 Revenue percentage
FER-I08-F1.4	F1.4 Foreign profit percentage
FER-I08-F1.5	F1.5 Foreign sales percentage
FER-I08-F1.6	F1.6 Total sales in last financial year
FER-I08-F1.7	F1.7 Profitability
FER-I08-F1.8	F1.8 Full time employees

FER-I08-G	G - Additional Research Issues
Interview 2 (2009)	
FER-I09-A	A - The Firms Current Position
FER-I09-B	B - The Value of Networks for Technology, Growth and Internationalisation
FER-I09-C	C - Critical Events and Network Relationships
FER-I09-D	D - Technology, Growth and Internationalisation
FER-I09-D1	D1 Stage of development
FER-I09-D2	D2 Stage of development over time
FER-I09-D3	D3 Critical events
Interview 3 (2011)	
FER-I11-A	A - The Firms Current Position
FER-I11-B	B - Value of Networks for Technology, Growth and Internationalisation
FER-I11-B1	B1 - Network contact 1 - Wife
FER-I11-B2	B2 - Network contact 2 - Co-founder
FER-I11-B3	B3 - Network contact 3 - EU Distributor
FER-I11-B4	B4 - Network contact 4 - Chinese Distributor
FER-I11-C	C - Knowledge Transfer
FER-I11-D	D - Firm Performance and Projections

Data Code	Data Source
Company Documents	
A	**Scottish Enterprise Reports**
FER-CDA-A	A - Scottish Enterprise Annual Report - 2004-2005
FER-CDA-B	B - Scottish Enterprise Annual Review - 2008-2010
B	**Patents**
FER-CDB-A	A - PCT patent publication application - 2009
FER-CDB-B	B - PCT patent publication application - 2010

Data Code	Data Source
Press Releases	

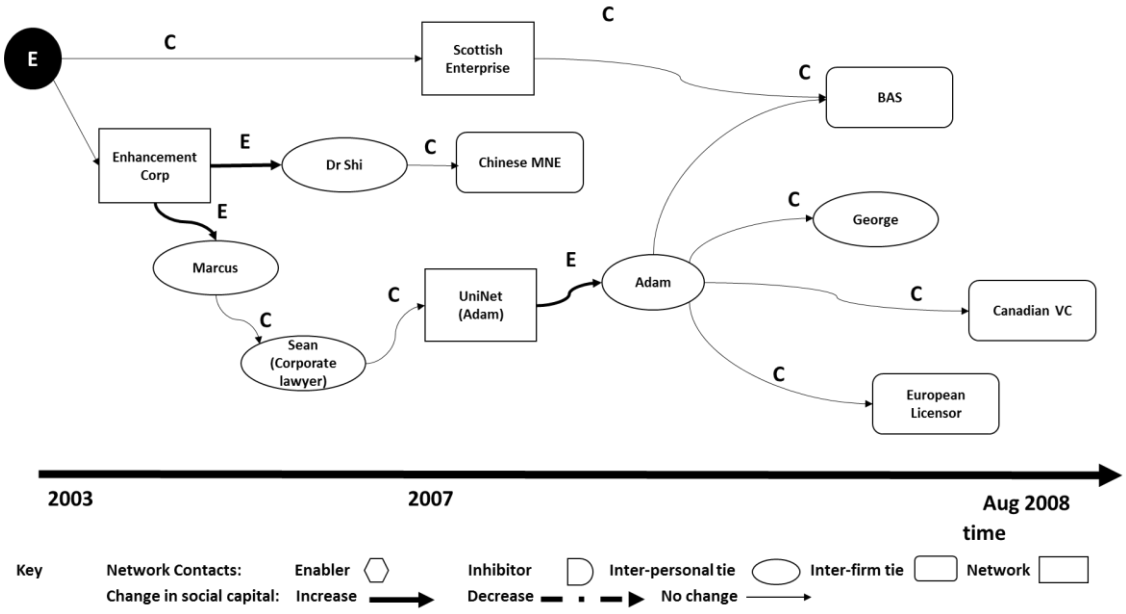
External	2008
FER-EPR08-A	A - SoS Fertility hopes £2m will ease to profit
FER-EPR08-B	B - Scotsman Fertility posied to gel with market
FER-EPR08-C	C - UniNet FemMed multi-million pound deal
FER-EPR08-D	D - UniNet Brad Davis
	2009
FER-EPR09-A	A - TalentScotland 2009 Burdica
FER-EPR09-B	B - Hearld Scotland Fertility Secures £200,000 funding
FER-EPR09-C	C - Blog - Fertility launches products
FER-EPR09-D	D - Biotech Innovation Fertility Launches First Product
FER-EPR09-E	E - Young Company Finance Fertility Speeds to Market
	2010
FER-EPR10-A	A - Nexxus Fertility Signs Contract with China
FER-EPR10-B	B - UniNet Biotech firm signs major Chinese deal
FER-EPR10-C	C - Scotsman Lucrative China deal for Scottish Biotech Firm
FER-EPR10-D	D - Herald Scotland Fertility Signs deal to supply drug to Chinese
FER-EPR10-E	E - FT - Fertility in £70million Chinese Deal
FER-EPR10-F	F- Compute Scotland Scottish Start-up China Deal
FER-EPR10-G	G - Business Blog - China business opportunities
FER-EPR10-H	H- UK fertility blog - Fertility signs Chinese agreement
	2011
FER-EPR11-A	A - MediLink World Leading Innovations Honoured
FER-EPR11-B	B - WHI News Fertility wins innovation award
FER-EPR11-C	C - Life Science Scotland Fertility wins innovation award
FER-EPR11-D	D - Nexxus News Summer 2011 - Fertility wins innovation award

Data Code	Data Source
Website	

A	**About Us**
FER-WA-A	A - About Fertility
M-WA-B	B - Ferility History
M-WA-C	C - Fertility Team
B	**China**
M-WB-A	A - Fertility China
C	**News**
M-WC-A	A - Fertility News
D	**Technology**
M-WD-A	A - Fertility FDA guidelines
M-WD-B	B - Fertility Investors
M-WD-C	C - Fertility Regulations
M-WD-D	D - Fertility Overview
E	**Products**
FER-WE-A	Product 1 - Fertility Lubricant
FER-WE-B	Product 2 - Moisturiser
FER-WE-C	Product 3 - Conception Kit
F	**Contact Us**
M-WF-A	A - Fertility Contact Us

Appendix 4: Within-Case Analysis Example

Fertility's Network Process before Event

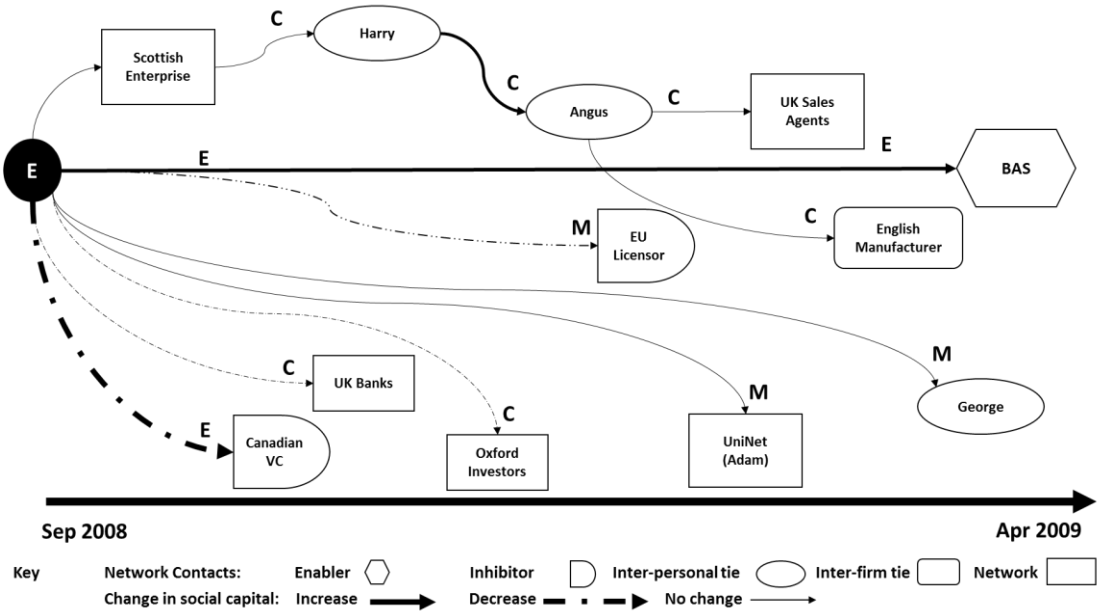


Source: The Author

Fertility Network Content before Critical Event

		Sources of Social Capital			Effects of Social Capital		
Network contact	NC	Structural	Relational	Cognitive	Benefits	Problems	Change in Stock Level
2003: Dr Shi	Create	Met Dr Shi whilst working for medical technology MNE		Actors shared a scientific interest in a unique technology	Dr Shi discovered technological opportunity		New
2007: Co-Founder (Dr Shi)	Modify		Both actors had trusted each other from previous NPD project	Shared ambition to start-up a medtech firm	Reputational of being globally recognised scientist		Redeploy↑
2007: Chinese distributor	Create	Met distributor at Chinese trade-show		Chinese distributor shared language with co-founder	Significant growth opportunities in Chinese market	Substantial investment required to build relationship	New
2007: Marcus (Enhance-ment Corp)	Extend	Met Marcus while working for medtech MNE			Marcus introduced entrepreneur to new contacts.		Invest↑
2007: Sean (Corporate lawyer)	Create	Introduced to Sean through Marcus		Sean was very supportive of Scottish technology start-ups	Introduced entrepreneur to Adam at UniNet		New
2007: Adam (university start-up network - UniNet)	Create	Introduced to start-up network through previous MNE contacts	Entrepreneur placed trust in Adam's start-up accelerator programme		Interest free start-up loan Workspace Mentoring		New
2007: George (investor)	Create	Introduced to George through Adam's start-up network	George had trust in the entrepreneur's ability to grow a business		Angel investment Local networks		New
2008: Adam at UniNet	Extend		Entrepreneur continued to invest his time in UniNet programme		Adam referred entrepreneur to potential strategic partnerships	Entrepreneur was unable to concentrate on NPD	
2008: European licensor	Create	Met licensor through Adam's university start-up network	Signed European license and co-development contract		Access to a global distribution channel	No clear prospect of international sales	New
2008: Canadian venture Capitalist	Create	Introduced to VC through university start-up network	Entered due diligence process		Prospect of venture capital funding	Resource intensive process	New
2008: Business angel syndicate	Create	Introduced to BAS through university start-up network	Trust in contact to provide finance		Secured £100,000 of seed funding		New

Fertility's Network Process during Event



Source: The Author

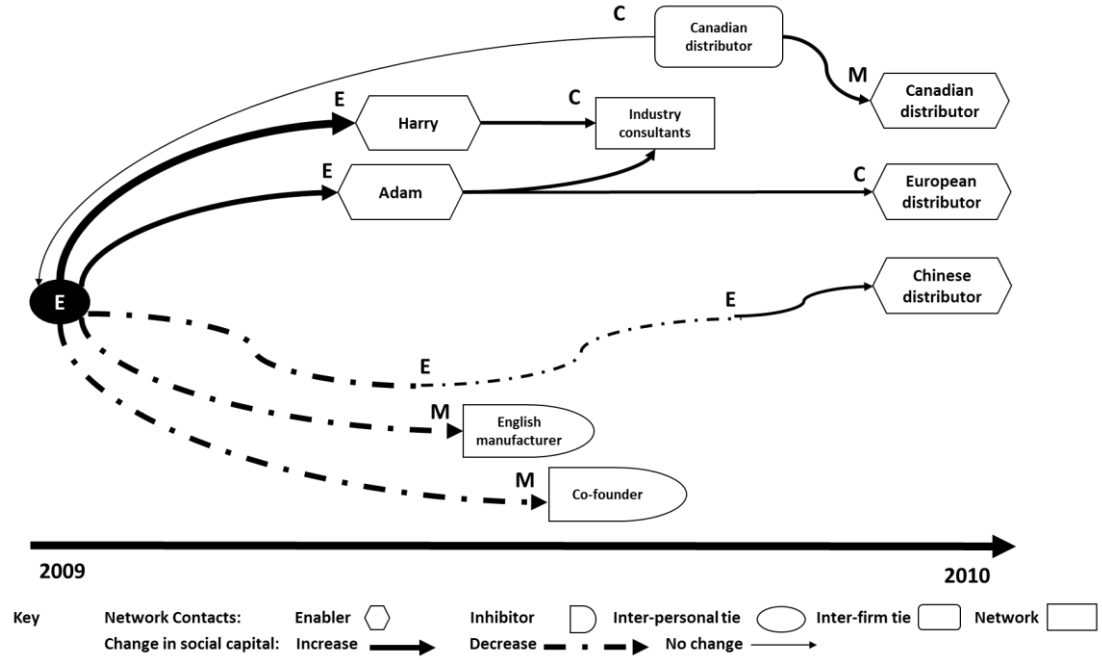
Fertility Networking Activities during Critical Event

		Sources of Social Capital			Effects of Social Capital		
Network contact	NC	Structural	Relational	Cognitive	Benefits	Problems	Change in Stock Level
2008: Harry	Create	Met Harry through Scottish Enterprise network	Reputation as influential life science entrepreneur	Early belief in Fertility's success	Business and emotional support Finance		New
2009: Canadian venture capitalist	Extend		Entrepreneur had trust VC would invest and dedicated significant resource to the relationship			VC did not invest. Fertility was totally dependent on VC investment	Invest↓
2009: Business angel syndicate (BAS)	Extend		New investment was contingent on VC funding but gave the firm more time to source investment			Unable to secure 'long-term' government SMART award	Invest↑

2009: Harry	Extend	Harry used his industry network to search for emergency funding	Increase in Harry's commitment as he allocated more time to Fertility	Both actors shared the vision to make Fertility successful	Harry introduced entrepreneur to Angus who was a 'critical' contact		Invest↑
2009: UK Banks	Create	Approached banks for finance				Unsuccessful with bank finance	New↓
2009: Oxford Investors	Create	Approached investors for seed capital				Unsuccessful with seed capital	New↓
2009: Angus (VP of MNE)	Create	Met VP through Harry's MNE network	Harry's endorsement helped with building trust	Angus took a personal interest in entrepreneurs journey	Provided NPD guidance and introduced Fertility to UK sales agents		New
2009: UK sales agents	Create	Sourced sales agents through VP's formal network	Signed UK sales agent contracts through new product classification		Generation of sales revenues		New
2009: European Licensor	Modify		Lack of focus to implement license strategy			Loss of revenues	Retrench→
2009: English manufacturer	Create	Sourced manufacturer through VP's formal network			Had the capability to quickly produce product		New
2009: Business angel syndicate	Extend		Increase in BAS trust by awarding Fertility a SMART award	Both actors shared a vision on the firm's international expansion	Fertility survives funding crisis Supports product launch		Invest↑
2009: Adam	Modify		Entrepreneur no longer considered Adam as a priority contact			This contact was no longer relevant for the business	Retrench→
2009: George	Modify		Entrepreneur no longer considered George as a priority contact			George was a "local guy" not a "global guy"	Retrench→

Source: The Author

Fertility's Network Process after Event



Source: The Author

Networking Activities after Critical Event

		Sources of Social Capital			Effects of Social Capital		
Network contact	NC	Structural	Relational	Cognitive	Benefits	Problems	Change in Stock Level
2009: Industry consultants	Create	Sourced a TMT of consultants through Harry and Angus's network	All consultants were willing to work for SWEAT equity	Early belief in Fertility's success	Access to foreign market knowledge No upfront labour costs		New
2009: Co-founder	Extend		Co-founder begins to lose interest in the venture	Co-founder wants to concentrate on science		Threat of losing angel investor and lack of transparency	Invest↓
2009: English manufacturer	Modify		Loss of trust in their production capabilities		Decrease in social capital triggered decision to internalise production	Quality problems with product Loss of sales revenues	Retire↓
2009: Co-founder	Modify		Co-founder agrees to exit the company through a share deferment	Co-founder felt uncomfortable with commercial aspect of the venture		Overall disappointment and loss of trust in co-founders commitment to venture	Retrench↓

2009: Chinese distributor	Extend		Entrepreneur had to participate in regular face-to-face visits to help build trust	Entrepreneur attempts to learn Mandarin to overcome language barriers	Regulatory approval in China Ten year distribution agreement - £60 million expected revenues	Delay in international sales due to Chinese regulatory process	Invest↑
2009: Angus (VP of HealthMed a large MNE)	Extend	VP referred to Fertility to his MNEs business development unit	VP's trust in entrepreneur supported the negotiation process	VP expressed a personal interest to help entrepreneur grow the company	Signed European distribution agreement		Invest↑
2010: European distributor	Create	Sourced European distributor through VP's insider network	Distributor received endorsement from VP on Fertility's capabilities		International sales and reputation benefits Foreign market and technological knowledge	Communicatio n problems with MNE No longer interacting with one person	New
2010: Canadian distributor	Create	Canadian distributor contacted Fertility		Distributor shown genuine excitement about product	Signed Canadian distribution agreement	Canadian regulatory approval delayed international revenues by six months	New
2010	Modify		Multiplex relationship as customer willing to finance extra production capacity		Increased production and international sales growth		

Source: The Author

Appendix 5: The Sources of INV Social Capital: Cross-Case Analysis

Source and Firm	Fertility	HeartBeat	FemMed	SafeMed
INVESTORS				
Structural	Adam at UniNet referred the firm to three investors. A Canadian VC, a local BAS and angel	VC approached the firm. US cardiologist referred two investors – one US VC and one angel	Searched for an appropriate investor and selected a local BAS	Raising venture capital "was a waste of time" so the firm pursued an early IPO
Relational	Was "dependent" on investors. Contact was regular and formal. Firm trusted business angel	Was "dependent" on investors. Contact was regular and formal	Quickly built a "personal" relation with local BAS through regular interaction	Shareholders had not invested what firm initially anticipated
Cognitive	Professional connection with all investors. Also had personal connection with angel	Professional connection with all investors. Also had personal connection with angel	Professional and intellectual connection with BAS	Only had professional connection with shareholders
MENTORS				
Structural	Founder met Harry through government network. Harry referred founder to Angus. Both were influential contacts	Founder met US cardiologist at trade fair who introduced the founder to many US based contacts	Californian surgeon approached founder through foreign distributor network.	Searched for mentors through professional network. CEO found their "FDA guy"
Relational	Regular interaction with influential contacts. Had early trust in them	Founder built friendship with US cardiologist. Had regular contact	Founder had regular contact Californian surgeon	Firm had great trust in FDA consultant
Cognitive	Personal, intellectual and personal connection with mentors. Similar vision	Intellectual and personal connection with cardiologist. Shared vision on future of industry	Intellectual, personal, professional connection with surgeon about industry problems	Professional connection with FDA consultant
SUPPLIERS				
Structural	Angus referred the firm to an English manufacturer	Founder searched his entrepreneurial network for a local subcontractor	Searched trade fairs for suitable subcontractors. Initially formed ties with a French manufacturer	Searched for R&D partners at trade fair. FDA consultant referred firm to US manufacturers
Relational	Founder selected English manufacturer based on Angus's recommendation	Founder selected local manufacturer on the based on "who he could trust"	Firm selected subcontractors on certifications and existing competencies	Firm selected subcontractors on "belief" they could perform the job
Cognitive	Professional connection with English manufacturer. No evidence of shared vision	Personal and professional connection with local manufacturer. No evidence of shared vision	Mainly professional connections, but personal connection with Scottish manufacturer	Professional connection with subcontractors. No evidence of shared vision
BUYERS				
Structural	Adam referred the firm to European licensor. Angus referred the firm to UK sales agents and European distributor.	Universities approached the firm as they are the industry "innovator". Universities were the firm's core customer.	Firm searched for early strategic buyer but were unsuccessful. Firm then searched for US distributor	Firm searched for US licensor but were unsuccessful. FDA guy then sourced a US distributor.
Relational	Firm had trust in all buyers capabilities to sell products. Firm had regular discussions with foreign licensors, agents and distributors	Firm had regular and open discussions with university customers on how to improve product	Firm was dependent on both strategic buyer for an exit, then on US distributor to sell their products	Firm was dependent on signing a US license agreement and then a US distribution agreement
Cognitive	Professional connection with most customers. No signs of shared vision	Intellectual, professional and personal connection with university customers	Professional connection with buyers. Did not share same vision	Professional connection with buyers. Did not share same vision
^ Consultant **Appendix 5B, 5C and 5D** for a more granular interpretation on how INVs create social capital				

Appendix 5B: Structural Sources that Create Social Capital

Category and Firm	Network Contact	Source of tie creation	Future referrals	Access to information or resources
INVESTORS				
Fertility	• George • Canadian VC • BAS • Canadian distributor	• Referral • Referral • Referral • Approached	• Local • None • Local • Canada	• Seed capital / ES /BS • No • Seed capital • Credit / sales
HeartBeat	• Indian VC • US VC • US angels	• Approached • Referral • Referral	• None • None • Local	• No • No • Seed capital
	• **HK manufacturer**	• **Referral**	• **Global**	• **Credit**
FemMed	• **BAS**	• **Search**	• **Global**	• **Seed / ES / BS**
SafeMed	• Shareholders	• Approached	• None	• Start-up funding
BUYERS				
Fertility	• Chinese distributor • European licensor • UK sales agents • European distributor • Canadian distributor	• Search • Referral • Referral • Referral • Approached	• Asia • None • UK • Europe • Canada	• Market knowledge • No • UK sales • Int' sales / NPD • Int' sales / credit
HeartBeat	• Universities	• Approached	• Global	• Int' Sales / R&D
	• **HK manufacturer**	• **Referral**	• **Global**	• **Int' Sales / credit**
FemMed	• Strategic buyer (1) • US distributor • Strategic buyer (2)	• Search • Search • Referral	• None • None • None	• No • No • Strategic exit
SafeMed	• US licensor • US distributor	• Search • Referral	• None • None	• No • No
SUPPLIERS				
Fertility	• UK manufacturer	• Referral	• None	• Product launch
HeartBeat	• Local manufacturer	• Search	• None	• Production
	• **HK manufacturer**	• **Referral**	• **Global**	• **R&D / production**
FemMed	• French manufacturer • Local manufacturer	• Search • Search	• None • None	• Production • Production
SafeMed	• Designers • NC manufacturer • NY manufacturer	• Search • Referral • Referral	• None • None • None	• No • No • No
MENTORS				
Fertility	• Adam at UniNet • George	• Search • Referral	• Global • Local	• Finance / BS • Seed funding / ES / BS
	• **Harry** • **Angus**	• **Referral** • **Referral**	• **Global** • **Global**	• **BS / ES / seed funding** • **BS / ES / NPD**
	• Executive consultants	• Referral	• Global	• NPD / BS / ES / Sales
HeartBeat	• **US cardiologist**	• **Mutual**	• **USA**	• **ES**
	• US Hospital • Debbie • US corporate lawyer	• Referral • Referral • Referral	• USA • Local • Global	• R&D • Start-up grants / BS • BS - negotiations
FemMed	• **Californian surgeon**	• **Approached**	• **USA**	• **ES / BS**
	• M&A specialist	• Search	• Global	• BS – strategic exit

SafeMed	• Corporate lawyer	• Search	• Australia	• BS - IPO
	• **FDA consultant**	• **Search**	• **USA**	• **BS / regulatory**

Key:
Shaded gray – Identified by respondent as critical success contact
BAS – Business angel syndicate;
BS – Business support;
ES – Emotional support;
Int' Sales – International Sales;
NPD – New Product Development

Appendix 5C: Relational Sources that Create Social Capital

Category and Firm	Network Contact	Safeguards	Initial interaction	Source of trust
INVESTORS				
Fertility	• George • Canadian VC • BAS • Canadian distributor	• Informal • Formal • Formal • Formal	• Frequent • Weekly • Frequent • Frequent	• COMP / VUL • DEP • DEP • COMP
HeartBeat	• Indian VC • US VC • US angels	• Formal • Formal • Informal	• Weekly • Weekly • Infrequent	• DEP • - • OPEN / COMP
	• **HK manufacturer**	• **Both**	• **Frequent**	• **COMP / VUL / REL**
FemMed	• **BAS**	• **Both**	• **Frequent**	• **COMP / VUL / REL**
SafeMed	• Shareholders	• Formal	• Infrequent	• No
BUYERS				
Fertility	• European licensor • UK sales agents • European distributor • Canadian distributor	• Formal • Formal • Both • Formal	• Weekly • N/A • Frequent • Frequent	• COMP • COMP / REL • COMP / REL / OPEN • COMP / REL / OPEN
HeartBeat	• Universities	• Informal	• Frequent	• VUL / OPEN / COMP
	• **HK manufacturer**	• **Both**	• **Frequent**	• **COMP / VUL / REL**
FemMed	• Strategic buyer (1) • US distributor • Strategic buyer (2)	• Formal • Formal • Formal	• Frequent • Infrequent • Frequent	• COMP • COMP / REL • COMP / REL
SafeMed	• US licensor • US distributor	• Formal • Formal	• Frequent • Frequent	• REL / VUL / REL • COMP
SUPPLIERS				
Fertility	• UK manufacturer	• Formal	• Infrequent	• COMP / REL
HeartBeat	• Local manufacturer	• Informal	• Frequent	• R EL/ COMP
	• **HK manufacturer**	• **Both**	• **Frequent**	• **COMP / VUL / REL**
FemMed	• French manufacturer • Local manufacturer	• Formal • Informal	• Infrequent • Frequent	• COMP • COMP / OPEN / REL
SafeMed	• Designers • NC manufacturer • NY manufacturer	• Formal • Formal • Formal	• Infrequent • Infrequent • Infrequent	• COMP • COMP • COMP
MENTORS				
Fertility	• Adam at UniNet • George	• Formal • Informal	• Frequent • Frequent	• VUL / REL / COMP • VUL / REL / COMP
	• **Harry**	• **Informal**	• **Frequent**	• **VUL / REL /COMP**

	• **Angus**	• **Informal**	• **Frequent**	• **VUL / REL / COMP**
	• Executive consultants	• Informal	• Frequent	• VUL / REL / COMP
HeartBeat	• **US cardiologist**	• **Friendship**	• **Frequent**	• **VUL / REL / COMP**
	• US Hospital	• Formal	• Infrequent	• COMP
	• Debbie	• Both	• Frequent	• VUL / REL / COMP
	• US corporate lawyer	• Formal	• Infrequent	• COMP / REL
FemMed	• **Californian surgeon**	• **Informal**	• **Frequent**	• **VUL / REL / COMP**
	• M&A specialist	• Formal	• Frequent	• COMP / REL
SafeMed	• Corporate lawyer	• Formal	• Infrequent	• COMP / REL
	• **FDA consultant**	• **Informal**	• **Frequent**	• **VUL / COMP / REL**

Key:
Shaded gray – Identified as critical success contact
COMP – Ego's trust in alters competence;
DEP – Ego's dependency on alter;
REL – Ego's trust in alters reliability;
VUL – Ego's likelihood to show their vulnerabilities to alter;

Appendix 5D: Cognitive Sources that Create Social Capital

COGNITIVE SOURCES THAT CREATE SOCIAL CAPITAL				
Category and Firm	**Network Contact**	**Shared culture (Local or global)**	**Shared goals**	**Outcome of connection**
INVESTORS				
Fertility	• George	• Local	• Yes	• PER / PROF
	• Canadian VC	• Global	• No	• PROF
	• BAS	• Local	• -	• PROF
	• Canadian distributor	• Global	• Yes	• PROF
HeartBeat	• Indian VC	• Global	• No	• PROF
	• US VC	• Global	• No	• PROF
	• US angels	• Global	• Yes	• PER / PROF
	• **HK manufacturer**	• **Global**	• **-**	• **PER / PROF**
FemMed	• **BAS**	• **Local**	• **Yes**	• **PROF / INTEL**
SafeMed	• Shareholders	• -	• -	• PROF
BUYERS				
Fertility	• European licensor	• Global	• No	• PROF
	• UK sales agents	• Local	• -	• PROF
	• European distributor	• Global	• Yes	• PER / PROF
	• Canadian distributor	• Global	• -	• PROF
HeartBeat	• Universities	• Global	• -	• INT / PROF / PER
	• **HK manufacturer**	• **Global**	• **-**	• **PER/ PROF**
FemMed	• Strategic buyer (1)	• Global	• No	• PROF
	• US distributor	• Global	• No	• PROF
	• Strategic buyer (2)	• Global	• Yes	• PROF/ INT/ PER
SafeMed	• US licensor	• Global	• No	• PROF
	• US distributor	• Global	• -	• PROF
SUPPLIERS				
Fertility	• English manufacturer	• Local	• -	• PROF
HeartBeat	• Local manufacturer	• Local	• -	• PER/PROF
	• **HK manufacturer**	• **Global**	• **-**	• **PER/PROF**

FemMed	• French manufacturer • Local manufacturer	• Global • Local	• - • Yes	• PROF • PROF / PER / INT
SafeMed	• R&D consultants • NC manufacturer • NY manufacturer	• Global • Global • Global	• No • - • -	• PROF • PROF • PROF
MENTORS				
Fertility	• Adam at UniNet • George	• Local • Local	• Yes • Yes	• PROF/ PER • PROF/PER
	• **Harry** • **Adam**	• **Local** • **Local**	• **Yes** • **Yes**	• **INT / PROF / PER** • **PROF / PER**
	• Executive consultants	• Local	• Yes	• PROF/PER
HeartBeat	• **US cardiologist**	• **Global**	• **Yes**	• **INT / PER**
	• US Hospital • Debbie • US corporate lawyer	• Global • Local • Global	• - • Yes • Yes	• PROF • PROF/ PER • PROF
FemMed	• **Californian surgeon**	• **Global**	• **Yes**	• **INT / PER / PROF**
	• M&A specialist	• Global	• Yes	• PROF
SafeMed	• Corporate lawyer	• Local	• Yes	• PROF / PER
	• **FDA consultant**	• **Global**	• **-**	• **PROF / PER**

Key:
Shaded gray - Identified as critical success contact;
Local – Domestic connection that shares culture;
Global – International connection that crosses borders
INT – Intellectual connection;
PER – Personal connection (e.g. socially embedded/outside of business);
PROF – Professional connection (e.g. primarily based on business);
Dash "-" – No Evidence

Appendix 6: The extension of INV social capital: Cross-case analysis

Appendix 6A

STRUCTURAL SOURCES THAT EXTEND SOCIAL CAPITAL				
		Source of tie extension	**Future access**	**Information or resources**
Investors				
Fertility				
HeartBeat				
FemMed	• **BAS**	• **Referral**	• **USA**	• **New TMT**
SafeMed	• Shareholders	• Search	• None	• No resources
Mentors				
Fertility	• **Harry** • **Angus**	• **Search** • **Referral**	• **Global** • **Global**	• **Emergency funding** • **Sales and marketing**
HeartBeat	• **US cardiologist**	• **Referral**	• **USA**	• **Market knowledge**
	• Lee (EliteTech)	• Referral	• Asia	• Sales and Marketing
FemMed	• **Californian Surgeon**	• **Referral**	• **USA**	• **Market knowledge**
SafeMed	• **FDA consultant**	• **Referral**	• **USA**	• **Production / sales**
Suppliers				
Fertility				
HeartBeat				
FemMed				
SafeMed				
Buyers				
Fertility				
HeartBeat				
FemMed	• US distributor	• Search	• USA	• Emotional support
SafeMed				
Key: Shaded gray - Identified as critical success contact; TMT – Top management team				

Appendix 6B

RELATIONAL SOURCES THAT EXTEND SOCIAL CAPITAL				
Category and Firm	**Network Contact**	**Commitment / Intensity**	**Interaction**	**Source of trust**
INVESTORS				
Fertility	• Canadian VC • BAS	• High • Low	• High • Moderate	• DEP / VUL • REL
HeartBeat	• Indian VC	• High	• High	• DEP
FemMed	• **BAS**	• **High**	• **High**	• **COMP / VUL / REL**
SafeMed	• Shareholders	• Moderate	• Low	• -
MENTORS				
Fertility	• **Harry** • **Angus**	• **High** • **Informal**	• **High** • **Frequent**	• **VUL / REL /COMP** • **VUL / REL / COMP**
HeartBeat	• US Cardiologist	• High	• High	• VUL / REL / COMP
	• Debbie	• Low	• Moderate	• VUL / REL / COMP
FemMed	• Californian surgeon	• High	• High	• VUL / REL / Comp
SafeMed	• FDA consultant	• Moderate	• High	• VUL / COMP / REL
SUPPLIERS				
Fertility				
HeartBeat	• US corporate lawyer	• Moderate	• Moderate	• COMP / REL
FemMed	• Local manufacturer	• High	• High	• COMP / OPEN / REL
SafeMed	• Designers • NC manufacturer • NY manufacturer	• High • High • High	• Low • Low • High	• COMP • COMP • COMP
BUYERS				
Fertility	• Chinese distributor	• High	• High	• -
HeartBeat	• Universities	• Low	• High	• VUL / OPEN / COMP
FemMed	• US distributor • Strategic buyer (2)	• High • High	• Low • High	• - • COMP / REL
SafeMed	• US licensor • NC distributor	• High • High	• Low • High	• REL / VUL / REL • COMP

Key:
Shaded gray – Identified as critical success contact
COMP – Ego's trust in alters competence;
DEP – Ego's dependency on alter;
REL – Ego's trust in alters reliability;
VUL – Ego's likelihood to show their vulnerabilities to alter;

Appendix 6C

COGNITIVE SOURCES THAT EXTEND SOCIAL CAPITAL				
Category and Firm	**Network Contact**	**Shared culture/ language**	**Shared goals**	**Outcome of connection**
INVESTORS				
Fertility				
HeartBeat	• Indian VC	• High	• High	• DEP
FemMed	• **BAS**	• **High**	• **High**	• **COMP / VUL / REL**
SafeMed				
MENTORS				
Fertility	• **Harry** • **Angus**	• **Moderate / Yes** • **Moderate / Yes**	• **Yes** • **Yes**	• **INT / PROF / PER** • **PROF / PER**
HeartBeat	• US Cardiologist	• High	• High	• VUL / REL / COMP
	• Debbie	• Low	• Moderate	• VUL / REL / COMP
FemMed	• Californian surgeon	• High	• High	• VUL / REL / Comp
SafeMed	• **FDA consultant**	• **Moderate/Yes**	• **-**	• **PROF / PER**
SUPPLIERS				
Fertility				
HeartBeat				
FemMed				
SafeMed				
BUYERS				
Fertility	• Chinese distributor	• Low / No	• High	• PROF / PER
HeartBeat	• Universities	• High /Yes	• -	• INT / PER / PROF
FemMed	• Strategic buyer (2)	• High	• High	• PROF / INT / PER
SafeMed				

Key:
Shaded gray – Identified as critical success contact
COMP – Ego's trust in alters competence;
DEP – Ego's dependency on alter;
REL – Ego's trust in alters reliability;
VUL – Ego's likelihood to show their vulnerabilities to alter;

Appendix 7: Bridging influences on new venture internationalisation

Appendix 7A: Local Referral Bridging Activity – Stronger and Weaker Practices

	Tie Type	Source of referral	Initial benefits or problems with networking activity	Initial influence on NVI			Subsequent influence on NVI		Further networking activities
				Inward / outward cross-border activity	Speed	Scope			
Local referral bridging – Stronger practices									
Fertility – Harry	Mentor	Scottish enterprise	**(+)** Provided business and emotional support	None	None	None	Introduced entrepreneur to Angus the VP of a EU distributor, who subsequently signed a distribution agreement	Enabler	Affinity bonding
Fertility – Angus	Mentor	Harry	**(+)** Provided guidance on NPD and introduced to UK sales agents	None	None	None	Angus introduced entrepreneur to TMT of EU distributor, who subsequently signed a distribution agreement	Enabler	Affinity bonding
HeartBeat – Debbie	Mentor	Queensland Government	**(+)** Helped secure innovation grants, file for foreign patents and regulatory approval	Outward R&D – Filed for PCT patent application and USA FDA approval	<1 year	Extra-region (USA)	Debbie continued to support the new venture's internationalisation	Enabler	Affinity bonding
Local referral bridging – Weaker practices									
Fertility – Dr Shi	Investor		**(+)** Co-founder discovered technological opportunity	Outward sales & marketing – Dr Shi introduced entrepreneur to Chinese distributor	<1 year	Extra-region (China)	Three years later, firm signs Chinese distribution agreement with an estimated international sales value of £60 million	Inhibitor	Impassive bonding Eliminating ties
Fertility – Adam at UniNet	Mentor		**(+)** Provided an interest free start-up loan, workspace and mentoring **(+)** Introduction to EU licensor **(+)** Introduction to Canadian VC	Outward sales & marketing – Signed EU license agreement	<1 year	Intra-region (Europe) Extra-region (Canada)	EU licensor terminated agreement as they lost interest in firms technology, while Canadian VC failed to invest and delayed the firm's commercialisation	Inhibitor	Prioritising ties
Fertility – English manufacturer	Supplier		**(+)** Had the capability to quickly produce product	None	None	None	Foreign customers were not satisfied with product quality	Inhibitor	Eliminating ties
Fertility – George	Investor Mentor		**(+)** Provided angel investment and access to local networks	None	-	None	None	Neutral	Prioritising ties
Fertility – BAS	Investor		**(+)** Provided seed capital and commercialisation knowledge	None	-	None	None	Neutral	Affinity bonding

Fertility – Sean	Mentor		**(+)** Sean introduce the entrepreneur to many domestic contacts	None	None	None	None	Neutral	Prioritising ties
Fertility – UK sales agents	Buyer		**(+)** Access to UK sales channel and generation of domestic sales revenues	None	None	None	None	Neutral	None
SafeMed – Local government advisor	Mentor		**(+)** Helped secure two early stage innovation grants	None	None	None	None	Neutral	Eliminating ties

Appendix 7B: Global Referral Bridging Activity – Stronger and Weaker Practices

	Tie formation			Initial influence on NVI			Subsequent influence on NVI		Further networking activities
	Tie Type	Source of referral	Initial benefits or problems with networking activity	Inward / outward cross-border activity	Speed	Scope			
Global referral bridging – Evidence of stronger practice									
Fertility – EU distributor	Buyer	Adam at UniNet	**(+)** Provided a source of international sales, reputational benefits and access to foreign market knowledge **(-)** Communication problems with MNE	Outward sales & marketing – Signed distribution agreement	3 years	Intra-region (Europe)	Distribution agreement continues to generate international sales	Enabler	New contact
Fertility – Chinese distributor	Buyer	Co-founder (Dr Shi)	**(+)** Co-founder shared language with Chinese distributor **(-)** An initial substantial investment was required to build the foundations for long-term relation	Does not sign official agreement but enters "trust building" phase	<1 year	Extra-region (China)	Three years later, firm signs Chinese distribution agreement with an estimated international sales value of £60 million	Enabler	Dependency bonding
HeartBeat – US hospital	Mentor	US cardiologist (Dr Arthur)	**(+)** Gained access to global R&D consortia providing reputational benefits within academic community	Outward R&D – Became official R&D partner on global research consortium	<1 year	Extra-region (USA)	US hospital introduced the entrepreneur to USA and Finish universities	Enabler	Global referral bridging
HeartBeat – US angels	Investor	US cardiologist (Dr Arthur)	**(+)** Secured angel seed capital investment	Inward finance – US angels invest $50,000	6 years	Extra-region (USA)	Investment supported US product launch	Enabler	None
HeartBeat – US corporate lawyer	Mentor	US cardiologist (Dr Arthur)	**(+)** No upfront labour costs and provided access to foreign market knowledge	Outward legal – US corporate lawyer took equity share in return for his expertise	6 years	Intra-region (Hong Kong)	Helped negotiate HK manufacturer production and distribution agreement	Enabler	Affinity bonding
HeartBeat – HK manufacturer	Supplier	Lee (VP of EliteTech)	**(+)** Has extensive production and regulatory capabilities	Outward production – Signed manufacturing agreement with Hong Kong manufacturer	7 years	Intra-region (Hong Kong)	HK manufacturer agreed to distribute firms products within Asia	Enabler	Reconfiguring ties
	Buyer	Lee (VP of EliteTech)	**(+)** Extensive access to Asian distribution channels	Outward sales & marketing – Signed distribution agreement with Hong Kong manufacturer	7 years	Intra-region (Hong Kong)	HK manufacturer became the firm's core customer	Enabler	Reconfiguring ties
FemMed – Strategic buyer (2)	Buyer	M&A specialist (TechSale)	**(+)** Secured successful trades-sale. Strategic buyer continued to expand the firm's product range	Firm enters a 6 month cross-border due diligence process	7 years	Intra-region (Europe)	Strategic buyer acquires FemMed	Enabler	None

Global referral bridging – Evidence of weaker practice									
Fertility – EU licensor	Buyer	Adam at UniNet	**(+)** Potential access to a global distribution channel **(-)** No clear prospect of international sales	Outward R&D – License out technology to European MNE	1 year	Intra-region (Europe)	EU licensor terminates agreement due to loss of interest in the firm's technology	Inhibitor	Reducing ties
Fertility – Canadian VC	Investor	Adam at UniNet	**(-)** VC did not invest and firm was totally dependent on investment	Did not sign inward agreement	2 years	Extra-region (Canada)	6 months of due diligence delayed commercialisation	Inhibitor	Dependency bonding
HeartBeat – US VC	Investor	US cardiologist (Dr Arthur)	**(-)** Lack of investor commitment. VC did not invest	Did not sign inward agreement	6 years	Extra-region (USA)	Entrepreneur retired relation early to prevent additional costs	Neutral	Eliminating ties
SafeMed – NC manufacturer	Supplier	FDA consultant	**(+)** Manufacturer encourages negotiations with NC distributor	Did not sign outward production agreement	10 years	Extra-region (USA)	Manufacturer's decision to cancel delayed commercialisation	Inhibitor	Impassive bonding
SafeMed – NC distributor	Buyer	FDA consultant	**(+)** Distributor begins clinical trials in US hospitals	Did not sign outward sales & marketing agreement	10 years	Extra-region (USA)	Distributor agreement was contingent on production agreement	Inhibitor	Dependency bonding
SafeMed – NY manufacturer	Supplier	FDA consultant	**(+)** Signs heads of agreement **(-)** Imbalanced partnership agreement as firm must purchase specialist equipment	Outward production – Signed contract out manufacturing "heads of agreement"	10 years	Extra-region (USA)	Manufacturer terminates agreement as firm were unable to purchase specialised equipment	Inhibitor	Impassive bonding

Appendix 7C: Local search bridging

	Tie formation			Initial influence on NVI			Subsequent influence on NVI		Further networking activities
	Tie Type	Source of network search	Initial benefits or problems with networking activity	Inward / outward cross-border activity	Speed	Scope			
FemMed – BAS	Investor	Scottish Enterprise	(+) Provided seed capital and access to experiential knowledge	None	None	None	BAS helped firm establish US sales subsidiary	Enabler	Affinity bonding Reconfiguring ties
FemMed – Scottish manufacturer	Supplier	US trade fair network	(+) Has FDA regulatory approval but are locally based which allowed regular site visits	Signed domestic agreement	None	None	Scottish manufacturer supported the delivery of the best quality product within the US market	Enabler	Affinity bonding
HeartBeat – Local manufacturer	Supplier	Entrepreneurial network	(+) Close proximity to R&D lab and supported the launch of product range	None	None	None	Local manufacturer was unable to produce for the product demand	Neutral	Prioritising ties
SafeMed – Corporate law firm	Mentor	CEO's professional network	(+) Helped raise AU$3.4 million start-up capital through IPO	Inward finance agreement – IPO brought in foreign capital investment	5 years	Global	Law firm had no further influence	Neutral	None

Appendix 7D: Global search bridging

	Tie formation			Initial influence on NVI			Subsequent influence on NVI		Further networking activities
	Tie Type	Source of referral	Initial benefits or problems with networking activity	Inward / outward cross-border activity	Speed	Scope			
FemMed – Strategic buyer (1)	Buyer	US trade fair	**(-)** Firm did not have sufficient experience to engage in due diligence process	Did not sign outward acquisition agreement	2 years	Extra-region (USA)	Unsuccessful trade-sale delayed the firm's NPD due to extensive due diligence	Inhibitor	None
FemMed – French manufacturer	Supplier	US trade fair	**(+)** Had specialist production capabilities and US regulatory approval **(-)** French location made collaboration difficult	Outward production – Signed contract out manufacture agreement	2 years	Intra-region (France)	Terminated sub-contractor due to poor product quality and cost	Inhibitor	Eliminating ties
FemMed – US distributor	Buyer	US trade fair	**(+)** Provided access to US and European sales channels along with reputational benefits	Outward sales & marketing – Signed direct exporting agreement with US distributor	2 years	Extra-region (USA)	US distributor did not sell the firm's products which resulted in a loss of international sales	Inhibitor	Impassive bonding Eliminating ties
FemMed – M&A specialist	Mentor	US industrial network	**(+)** Helped identify potential buyers and provided legal guidance	Outward legal – Contract out acquisition process to overseas firm	7 years	Extra-region (USA)	Firm was acquired by medical technology MNE	Neutral	None
SafeMed – Shareholders	Investor	ASX exchange	**(+)** IPO raised AUS$3.4 million	Inward finance – IPO brought in foreign capital investment	5 years	Global	Shareholders refused to increase their investment which stopped commercialisation	Inhibitor	Impassive bonding
SafeMed – R&D consultants	Supplier	MEDICA trade fair	**(-)** Initial prototype delays, quality problems and were charging high fees	Outward R&D – Contract out R&D to overseas firms	6 years	Extra-region (China/USA)	R&D consultants did not deliver what they were contracted to do	Inhibitor	Impassive bonding
SafeMed – US licensor	Buyer	MEDICA trade fair	**(-)** Resource intensive process with communication problems	Did not sign outward R&D agreement	8 years	Extra-region (USA)	US licensor refused to invest in firms technology	Inhibitor	Impassive bonding
SafeMed – FDA consultant	Mentor	US trade show	**(+)** Helped with FDA application and provided access to local US networks	Outward R&D – Contract out part of the regulatory process to US consultancy	10 years	Extra-region (USA)	FDA consultant introduced firm to impassive partners	Inhibitor	Dependency bonding

Appendix 7E – Global acceptance bridging

	Tie formation			Initial influence on NVI			Subsequent influence on NVI		Further networking activities
	Tie Type	Reason for approach	Initial benefits or problems with networking activity	Inward / outward cross-border activity	Speed	Scope			
Fertility – Canadian distributor	Buyer	Unique technology	**(+)** Provided North American distribution channel	Outward sales & marketing – Signed distribution agreement	3 years	Extra-region (Canada)	Generation of international sales revenues	Enabler	Dependency bonding Reconfiguring ties
HeartBeat – US cardiologist	Mentor	Similar research interests	**(+)** Instant friendship brought future benefits surrounding R&D, sales and marketing	Outward R&D – Introduced entrepreneur to US hospital led research consortium	<1 year	Extra region (USA)	Cardiologist became key opinion leader and helped the firm sign distribution agreement with HK manufacturer	Enabler	Affinity bonding
HeartBeat – Universities	Mentor	Unique technology	**(+)** Universities helped support R&D due to similar research interests	Outward R&D – Signed co-R&D agreements with Finish and USA universities	3 years	Extra region (Finland/ USA)	Universities also became the firm's core customer base	Enabler	Affinity bonding
HeartBeat – Indian VC	Investor	Unique technology	**(-)** Initial due diligence delayed expansion by 6 months	Did not sign inward finance agreement	5 years	Extra-region (India)	Due diligence delayed the firm's commercialisation	Inhibitor	Dependency bonding
FemMed – Californian surgeon	Mentor	Medical interest in product	**(+)** Surgeon encouraged the entrepreneur to implement a US direct sales strategy	Outward sales & marketing – Encouraged firm to maintain presence in US market	3 years	Extra region (USA)	Surgeon became key opinion leader for firm and encouraged them to establish US sales subsidiary	Enabler	Affinity bonding

Appendix 8 Bonding activities that influence new venture internationalisation

Appendix 8A: Dependency Bonding

	Tie Investment			Initial influence on NVI			Subsequent influence on NVI		Further networking activities
	Tie Type	Reason for investment	Initial benefits or problems with networking activity	Inward / outward cross-border activity	Speed	Scope			
Dependency bonding – Evidence of stronger practises									
Fertility – Chinese distributor	Buyer	To build initial trust with distributor	(+) Frequent interaction led to the signing of "significant" distribution agreement **(-)** Chinese regulatory process took longer than expected	Does not sign official agreement but enters "trust building" phase	<1 year	Extra-region (China)	Three years later, firm signs Chinese distribution agreement with an estimated international sales value of £60 million	Enabler	Global referral bridging
FemMed – Strategic buyer (2)	Buyer	Dependent on actor acquiring the firm	**(+)** Successful acquisition with an agreed continued expansion of product	Firm enters a 6 month cross-border due diligence process	7 years	Intra-region (Europe)	Strategic buyer acquires FemMed	Enabler	Global referral bridging
Dependency bonding – Evidence of weaker practices									
Fertility – Canadian VC	Investor	Dependent on actors investment	**(-)** VC did not invest and firm was totally dependent on investment	Did not sign inward finance agreement	2 years	Extra-region (Canada)	VC does not invest and delays commercialisation	Inhibitor	Global referral bridging
Fertility – Adam at UniNet	Mentor	Dependent on actors referrals	**(+)** Mentor introduced the entrepreneur to an EU licensor and Canadian VC	Outward R&D – License out technology to European MNE	1 year	Intra-region (Europe)	EU licensor terminates agreement and introduces him to Canadian VC	Inhibitor	Local referral bridging Prioritising ties
HeartBeat – Indian VC	Investor	Dependent on actors investment	**(-)** VC did not invest and firm was totally dependent on investment	Did not sign inward finance agreement	5 years	Extra-region (India)	Due diligence delayed the firm's commercialisation	Inhibitor	Global acceptance bridging
SafeMed – FDA consultant	Mentor	Trust in actors competence	**(+)** FDA consultant provided access to US commercial networks	Outward R&D – Contract out part of the regulatory process to US consultancy	10 years	Extra-region (USA)	FDA consultant introduced firm to impassive partners	Inhibitor	Global search bridging
SafeMed – NC distributor	Buyer	Dependent on actor acquiring the firm	**(+)** News of US distribution agreement leads to 8% increase in share price **(-)** Agreement is contingent on firm purchasing manufacturing equipment	Did not sign outward sales & marketing agreement	10 years	Extra-region (USA)	Distributor agreement was contingent on production agreement	Inhibitor	Global referral bridging

Appendix 8B: Impassive bonding

	Tie Investment			Initial influence on NVI			Subsequent influence on NVI		Further networking activities
	Tie Type	Reason for investment	Initial benefits or problems with networking activity	Inward / outward cross-border activity	Speed	Scope			
Fertility – Co-founder (Dr Shi)	Investor	Trust in actors competence	(+) Co-founder discovers unique technology (-) Co-founder begins to lose interest in the business	Outward sales & marketing – Co-founder introduces entrepreneur to Chinese distributor	1 year	Extra-region (China)	Co-founder exits the company, which has a negative impact on Chinese distributor relations	Inhibitor	Local referral bridging Eliminating ties
Fertility – BAS	Investor	Trust in actors likelihood to invest	**(-)** Unable to secure long-term government SMART award due to financial crisis	None	None	None	Firm secures emergency capital and survives funding crisis. Emergency funding supports product launch	Enabler	Local referral bridging
FemMed – US distributor	Buyer	Trust in actors reliability	**(-)** Lack of commitment to sell products	Outward sales & marketing – Firm signs US distribution agreement	2 years	Extra-region (USA)	Distribution agreement did not generate international sales	Inhibitor	Global search bridging Eliminating ties
SafeMed – R&D consultants	Supplier	Trust in actors competence	**(-)** Initial prototype delays, quality problems and were charging high fees	Outward R&D – Contract out R&D to overseas firms	6 years	Extra-region (China/USA)	R&D consultants did not deliver what they were contracted to do	Inhibitor	Global search bridging
SafeMed – US licensor	Buyer	Dependent on actor's partnership	**(-)** Resource intensive process with communication problems	Did not sign outward R&D agreement	8 years	Extra-region (USA)	US licensor refused to invest in firms technology	Inhibitor	Global search bridging
SafeMed – Shareholders	Investor	Trust in actors reliability	**(+)** IPO raised AUS$3.4 million	Inward finance – IPO brought in foreign capital investment	5 years	Global	Shareholders refused to increase their investment which stopped commercialisation	Inhibitor	Global search bridging
SafeMed – NC manufacturer	Supplier	Dependent on actors partnership	**(+)** Manufacturer encourages negotiations with NC distributor	Did not sign outward production agreement	10 years	Extra-region (USA)	Manufacturer's decision to cancel delayed commercialisation	Inhibitor	Global referral bridging
SafeMed – NY manufacturer	Supplier	Dependent on actors partnership	**(+)** Signs heads of agreement **(-)** Imbalanced partnership agreement as firm must purchase specialist equipment	Outward production – Signed contract out manufacturing "heads of agreement"	10 years	Extra-region (USA)	Manufacturer terminates agreement as firm were unable to purchase specialised equipment	Inhibitor	Global referral bridging

Appendix 8C: Affinity Bonding

	Tie Investment			Initial influence on NVI			Subsequent influence on NVI		Further networking activities
	Tie Type	Reason for extended investment	Initial benefits or problems with networking activity	Inward / outward cross-border activity	Speed	Scope			
Affinity bonding – Stronger practices									
Fertility – Harry	Mentor	Had trust in showing vulnerabilities	**(+)** Harry introduced entrepreneur to his "global start-up" network	None	None	None	Introduced entrepreneur to Angus the VP of a EU distributor, who subsequently signed a distribution agreement	Enabler	Local referral bridging
Fertility – Angus	Mentor	Had trust in showing vulnerabilities	**(+)** Angus introduced entrepreneur to TMT of large EU medical technology MNE	None	None	None	Angus introduced entrepreneur to TMT of EU distributor, who subsequently signed a distribution agreement	Enabler	Local referral bridging
HeartBeat – Debbie	Mentor	Had trust in showing vulnerabilities	**(+)** Helped secure additional SMART award while providing business and emotional support	Outward R&D – Filed for PCT patent & USA FDA approval	<1 year	Extra-region (USA)	Debbie continued to support the new venture's internationalisation	Enabler	Local referral bridging
HeartBeat – US cardiologist	Mentor	Had trust in showing vulnerabilities	**(+)** Helped the entrepreneur determine new strategic direction	Outward R&D – Introduced entrepreneur to US hospital led research consortium	<1 year	Extra region (USA)	Cardiologist became key opinion leader and helped the firm sign distribution agreement with HK manufacturer	Enabler	Global acceptance bridging Reconfiguring ties
HeartBeat – Universities	Mentor	Had trust in showing vulnerabilities	**(+)** Reputation is increased from academic research conducted on its products	Outward R&D – Signed co-R&D agreements with Finish and USA universities	3 years	Extra region (Finland/ USA)	Universities also became the firm's core customer base	Enabler	Global acceptance bridging Reconfiguring ties
HeartBeat – US corporate lawyer	Mentor	Trust in actors competence	**(+)** Corporate lawyer took SWEAT equity opposed to fees	Inward legal – US corporate lawyer took equity share in return for his expertise	6 years	Intra-region (Hong Kong)	Helped negotiate HK manufacturer production and distribution agreement	Enabler	Global referral bridging
HeartBeat – Lee VP of EliteTech	Mentor	Trust in actors competence	**(+)** Lee introduced the entrepreneur to TMT of HK manufacturer	Outward production – Signed manufacturing agreement with	7 years	Intra-region (Hong Kong)	HK manufacturer agreed to distribute firms products within Asia	Enabler	None

				Hong Kong manufacturer					
FemMed – BAS	Investor	Had trust in showing vulnerabilities	**(+)** BAS provided finance along with emotional and business support	None	None	None	BAS helped firm establish US sales subsidiary	Enabler	Local search bridging Reconfiguring ties
FemMed – Californian surgeon	Mentor	Had trust in showing vulnerabilities	**(+)** Provided access to local U.S medical network along with continued emotional and business support	Outward sales & marketing – Encouraged firm to maintain presence in US market	3 years	Extra region (USA)	Surgeon became key opinion leader for firm and encouraged them to establish US sales subsidiary	Enabler	Global acceptance bridging Reconfiguring ties
FemMed – Scottish manufacturer	Supplier	Trust in actors competence	**(+)** Delivery of cost efficient and quality products	Outward sales & marketing – Encouraged firm to maintain presence in US market	3 years	Extra region (USA)	Surgeon became key opinion leader for firm and encouraged them to establish US sales subsidiary	Enabler	Local search bridging*
*Local search took place in US through sales subsidiary									

[The End]