

EMBEDDED RELATIONS AND MARKETING CAPABILITIES

By

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TABLE OF CONTENTS

| | |
|--|-----------|
| ABSTRACT | 7 |
| CHAPTER 1: AN INTRODUCTION TO CAPACITIES..... | 9 |
| CONCEPTUAL BACKGROUND | 10 |
| <i>Dynamic Capabilities</i> | 11 |
| <i>Absorptive Capacity</i> | 18 |
| CONCLUSION..... | 22 |
| CHAPTER 2: ESSAY 1 – COOPETITION IN AN EMBEDDED RETAIL SALES ASSEMBLAGE | 25 |
| THEORETICAL BACKGROUND | 27 |
| <i>Coopetition</i> | 27 |
| ASSEMBLAGE THEORY | 30 |
| RESEARCH CONTEXT | 34 |
| METHODOLOGY | 35 |
| FINDINGS..... | 37 |
| <i>Overview of Findings</i> | 37 |
| <i>Actor and Assemblage Capacities</i> | 38 |
| <i>Territorializing Processes and Assemblage Disruption</i> | 43 |
| <i>Cooperation and Competition in Embedded Sales Forces</i> | 49 |
| CONCLUSION..... | 52 |
| CHAPTER 3: ESSAY 2 - ACQUIRING THE GENIUS INVENTOR..... | 56 |
| CONCEPTUAL BACKGROUND | 60 |
| <i>Inventor Integration and Outcomes</i> | 60 |
| <i>Inventor Integration and its Antecedents</i> | 65 |
| METHODOLOGY | 69 |

| | |
|--|------------|
| <i>Research Context</i> | 69 |
| <i>Sample Data Collection</i> | 70 |
| MEASURES | 72 |
| <i>Inventor Integration</i> | 72 |
| <i>Antecedents of Inventor Integration</i> | 72 |
| Relational Capacities | 73 |
| <i>Innovation outcomes</i> | 74 |
| Number of innovations..... | 74 |
| Breadth of innovations..... | 74 |
| Depth of innovations | 75 |
| <i>Control Variables</i> | 76 |
| Size of the acquiring firm | 76 |
| R&D expenses of the acquiring firm. | 76 |
| <i>Analysis</i> | 76 |
| CONCLUSION | 79 |
| APPENDIX A: FIGURES | 83 |
| APPENDIX B: TABLES | 84 |
| REFERENCES | 107 |

ABSTRACT

This dissertation explores the role of capacities of different sets of actors and examines some of the consequences of realization of these capacities. Specifically, the two outcomes examined in this dissertation are cooperation, which is simultaneous cooperation and competition, and innovation. This research uses different contexts and multiple methods to understand and explore the role of capacities in varied outcomes.

The first essay examines the effect of actor capacities on cooperation. It looks at cosmetics salespeople in department stores that are embedded in relations with the store and the cosmetics brands among others, and examines the effect of this embeddedness on cooperative or competitive responses of these salespeople. Specifically, this research posits that actors, both human and non-human, possess capacities to interact with other actors. Unless the interaction occurs, the capacity merely remains a potential, and is only realized in interaction. Capacities represent the joint agency of interacting actors or entities. Both individual actors and collectives possess capacities to interact with others. Capacities of actors and collectives determine the processes employed by these actors that help integrate the collective or disintegrate it, thereby dynamically influencing the balance between cooperation and competition among sales people.

The second essay examines the capacities of inventors in Biotechnology industry and investigates innovation as an outcome of realization of their capacities. This essay specifically focuses on actor capacities and its outcomes in the event of an acquisition. It posits that potential relational capacities of inventors prior to an acquisition determines

whether integration among inventors will happen at the time of the acquisition. In addition, this research studies the effect of inventor integration at the time of acquisition on innovation outcomes of the acquiring firm, four years from the time of acquisition.

CHAPTER 1: AN INTRODUCTION TO CAPACITIES

Survival and growth are the two prime objectives of organizations. Organizations, in order to grow and survive, engage in activities like coordination and integration that aim to bring together all resources and capabilities of an organization, such that, the organization functions seamlessly as a true collective. Literature based on RBV emphasizes the importance of unique resources in a firm's success. The dynamic capabilities view adds to the RBV by suggesting that resources by itself cannot contribute to a firm's competitive advantage and thereby to its success. It is the capability of an organization to bring the resources together and deploy them effectively that leads to successful outcomes. To add to this, the literature on absorptive capacities suggest that firms should have the capacity to absorb knowledge from other entities, in order for it to be able to dynamically change and be capable of configuring different resource combinations and deployments. While the perspectives provided by RBV, dynamic capabilities view and absorptive capacities view provide us with frameworks to understand ways in which successful firms grow and succeed, there are several redundancies and shortcomings that are common to these literature streams. To begin with, the definitions of the terms like resources and capabilities are used interchangeably in the literature. While there are numerous definitions used by scholars, there are many inconsistencies in these definitions and concepts.

In order to better understand factors that help organizations change and adapt, first, I conceptually distinguish between the concept of resources and capabilities that are often used interchangeably when understanding a firm's path towards change and adaptation. Second, I review the literature on dynamic capabilities and absorptive

capacities to identify commonalities and differences in the two streams of literature. This enhances our understanding of dynamic capabilities and absorptive capacities literature by providing a comprehensive and overarching framework of the perspectives that guide the discipline. Third, I identify the various issues and gaps in the literature on dynamic capabilities and absorptive capacity. Finally, drawing from Assemblage Theory, I propose the concept of “Capacities” as a way to address the issues and gaps in the RBV and capabilities literature, and to understand what it takes for an organization to function as a true collective.

CONCEPTUAL BACKGROUND

Researchers agree that resources and capabilities are important for organizations to survive, grow and succeed. Resources and capabilities therefore form the basis of RBV, dynamic capabilities view, absorptive capacities view and several other organization based growth theories in the literature. These terms, however, are often used interchangeably by scholars. Barney (1991) in his seminal piece on RBV defines a firm’s resources as “all assets, capabilities, organizational processes, firm attributes, information, knowledge etc. controlled by a firm that enables the firm to conceive of and implement strategies that improve its efficiency and effectiveness.” This definition does not distinguish between resources and capabilities. This muddled difference between resources and capabilities is prominent even in several recent definitions. For instance, Ambrosini et al (2009) define resources as “activities, capabilities etc. which allow the firm to generate rents.” In order to clarify what constitutes resources, I adopt the definition of resources as advanced by Day (2011). Resources comprise of “assets that

are tangible and intangible endowments such as brands, facilities, intellectual property etc. that can be valued and traded” (Day 2011). Resources form the foundation of a firm and the basis for firm capabilities. They represent zero-order elements (Wang and Ahmed 2007) that are essential in order for a firm to build expertise in the future.

Capabilities, like resources, are defined in many ways (Table 1). But there are elements common to these definitions. Capabilities are firm specific (Amit and Schoemaker 1993; Ethiraj et al 2005; Bingham et al 2007, Wang and Ahmed 2007) and they are created over time (Amit and Schoemaker 1993). They are embedded in routines and processes that facilitate deployment of various resource combinations (Wang and Ahmed 2007; Dierickx and Cool 1989; Ethiraj et al 2005; Bingham et al 2007). It is important to understand the distinction between resources and capabilities in order to better understand the framework within which growth based theories like Absorptive capacity and dynamic capabilities are studied.

Dynamic Capabilities

Barney (1991), in his attempts to explain sources of competitive advantage enjoyed by successful organizations, provided a static portrayal of organizational capabilities as well-honed and difficult to copy routines for carrying out established processes. In order to account for the dynamic nature of capabilities, the dynamic capabilities view came into existence. While static and dynamic capabilities are both attempts to explain competitive advantage and growth of successful firms, dynamic capabilities view emphasizes that in order for the competitive advantage to be sustainable over the long run, the capabilities need to be dynamic to create, adjust, and keep relevant

stock of capabilities. The dynamic capabilities paradigm is an integrative approach to RBV, offering a closer understanding of sources of competitive advantage. But what are dynamic capabilities? There are many definitions of dynamic capabilities in the literature (Table 2). Teece (1997), in his influential piece on dynamic capabilities defines dynamic capabilities as “the firm’s ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments”. Over the years, several scholars have added to this definition. Some scholars regard capabilities as dynamic by itself and hence do not differentiate between the two (Amit and Schoemaker 1993; James et al 1998; Helfat 2007). Others have distinct definitions of dynamic capabilities, emphasizing its unique aspects. Helfat (2007) and Ambrosini et al (2009) define dynamic capabilities by focusing on the capacity of an organization to “purposefully” extend, or modify its resource base. Anand et al 2009, King and Tucci 2002, Eisenhardt and Martin 2000; Zollo and Winter 2002 among others, in their definition of dynamic capability focus on the “learned, stable and routine” nature of processes that characterize dynamic capability. In addition, while some researchers focus on external environment as a facilitator or antecedent of dynamic capability (King and Tucci 2002; McKelvie & Davidsson 2009; Eisenhardt & Martin 2000; Teece et al 1997), others focus on outcomes of dynamic capability, like, competitive advantage (Augier & Teece 2009; Wang and Ahmed 2007), improved effectiveness (Anand et al 2009; Zollo and Winter 2002), and problem solving (Zahra et al 2006). The many definitions with its focus on different aspects, while it provides us with different and diverse perspectives, fail to provide us with an understanding of what comprises dynamic capabilities. It further adds to the complexity as there is a vast body of research that looks at various antecedents and

consequences of dynamic capabilities. With varied definitions and varied operationalizations, the concept of dynamic capabilities appear overly inclusive, elastic (Williamson 1999) and unclear. In addition, in many cases, the definition of dynamic capabilities is tautological (Williamson 1999; Winter 2003; Zahra et al 2006; Levinthal and Ocasio 2007) and mixes up the characteristics of the firm with the context in question (Zahra et al 2006).

While the definition of dynamic capabilities is muddled, there are several characteristics of dynamic capabilities that can be inferred from prior research. Dynamic capabilities encapsulates the wisdom from earlier work on distinctive competence (Learned et al 1969; Selznick 1957), organizational routine (Nelson and Winter 1982), architectural knowledge (Henderson and Clark 1990), core competence (Prahalad and Hamel 1990), core capability and rigidity (Leonard-Barton 1990), combinative capability (Kogut and Zander 1992) and architectural competence (Henderson and Cockburn 1994). Dynamic Capabilities theory posits that the most significant and enduring source of competitive advantage, rather than being located in the simple possession of idiosyncratic resources, is constituted by the capability of firms to acquire, integrate, and deploy resources in ways that match each firm's market environment (Eisenhardt and Martin 2000; Morgan, Vorhies & Mason 2009; Teece, Pisano, & Shuen 1997). Dynamic capabilities are structured and persistent (Rindova and Kotha 2001). They are not just processes but are embedded in processes (Wang and Ahmed 2007). They are a form of behavioral orientation that underlies transforming firm resources and capabilities into output in forms such as products or services that deliver superior value (Wang and Ahmed 2007). And they are firm specific (Makadok 2001; Arend and Bromiley 2009)

and path dependent (Arend and Bromiley 2009).

Bowman & Ambrosini (2003) suggest that dynamic capabilities consist of four main processes, namely, reconfiguration, leveraging, learning and integration. Reconfiguration refers to the transformation and recombination of assets and resources. Leveraging refers to the replication of a process or system that is operating in one area of a firm into another area, or extending a resource by deploying it into a new domain. Learning component of dynamic capability allows tasks to be performed more effectively and efficiently, often as an outcome of experimentation, and permits reflection on failure and success. The final component of dynamic capability is integration. It refers to the ability of the firm to integrate and coordinate its assets and resources, resulting in the emergence of a new resource base. In addition, there are other frameworks advanced by scholars to understand dynamic capabilities. Wang and Ahmed (2007) suggest that adaptive capability, absorptive capability and innovative capability are three distinct components of dynamic capability. Adaptive capability refers to the firm's ability to identify and capitalize on emerging opportunities (Chakravarthy 1982; Hooky et al 1992; Miles and Snow 1978) with a focus on balancing exploration and exploitation strategies (Staber and Sydow 2002). Absorptive capability, according to the authors is the same as absorptive capacity and is defined as the firm's ability to recognize, assimilate, and convert new information to commercial ends (Cohen & Levinthal 1990). Innovative capability is the firm's ability to develop new products and/or markets, through aligning strategic innovative orientation with innovative behaviors and processes (Wang and Ahmed 2004). Ambrosini et al (2009) propose yet another framework to understand dynamic capabilities. They posit that dynamic capabilities consist of incremental,

renewing and regenerative dynamic capabilities. Incremental dynamic capability is related to continuous improvements; renewing dynamic capability refreshes, adapts and augments the resource base; and regenerative dynamic capability impacts not just the firm's resource base, but its current set of dynamic capabilities, such that, they change the way the firm changes its resource base.

There are several factors that drive dynamic capabilities. Figure 1 illustrates the overarching framework of dynamic capabilities with its various antecedents and outcomes. The factors that drive dynamic capabilities can be categorized into two kinds -- external factors and internal factors. External factors like exogenous shock (Newey & Zahra 2009) that are unpredictable and uncertain drive organizations to develop their dynamic capabilities. In addition, several internal factors (as defined in Table 3) drive dynamic capabilities. The role played by managers is vital in the development of dynamic capabilities. A manager engages in several roles within an organization. The manager sets and articulates goals, evaluates opportunities, sets culture, builds trust and plays a critical role in all strategic decisions (Augier & Teece 2009). They sense the environment, and seize and act on opportunities that benefit the organization (Ambrosini & Bowman 2009; Adner & Helfat 2003; Conner 2007). These roles played by a manager form the essence of dynamic capabilities. Repeated practice and experience cautions organizations against potential problems and shields them from uncertainties and mishaps, thereby enhancing an organization's dynamic capabilities (Eisenhardt & Martin 2000; King & Tucci 2002). Continuous improvements, defined as a systematic effort to seek out and apply new ways of doing things by actively and repeatedly making process improvements also serves as a driver of dynamic capabilities. Knowledge articulation, a process by which organizations

determine the effectiveness of particular organizational approaches and communicate this information throughout the organization (Levinthal & March 1993; Zollo & Winter 2002); and knowledge codification, defined as a process by which organizations document understanding of the effectiveness of specific processes (Macher & Mowery 2009) also influence dynamic capabilities. In addition, endogenous planning, where a firm's initiatives in developing new products, services and/or businesses arising from the firm's own internal opportunity recognition (Shane and Venkataraman 2000) and a firm's transactive memory systems, a shared system that individuals in groups and organizations develop to collectively encode, store, and retrieve information or knowledge from different domains (Wegner 1987) are important contributors to a firm's dynamic capabilities. Ren et al (2006), through a simulation, demonstrate that transactive memory systems are especially more valuable in environments that are dynamic, and provide a foundation for dynamic capabilities. In summary, internal factors like managerial capabilities (Augier & Teece 2009; Ambrosini & Bowman 2009; King and Tucci 2002; Harreld et al 2007; Adner & Helfat 2003; Connor 2007), practice and experience (Eisenhardt & Martin 2000; King & Tucci 2002), continuous improvements (Anand et al 2009), knowledge articulation (Macher & Mowery 2009), knowledge codification (Macher & Mowery 2009), endogenous planning (Newey & Zahra 2009) and transactive memory systems (Newey & Zahra 2009) drive an organization's dynamic capabilities.

Dynamic capabilities are regarded as vital for an organization's success, as it confers several beneficial outcomes for the organization. Some of the beneficial outcomes of dynamic capability are sustainable competitive advantage (Ambrosini & Bowman 2009; Barney 2001a; 2001b), evolutionary fit (Teece 2007; Helfat et al 2007),

which indicates how well the capacity enables a firm to make a living (Helfat et al 2007), increased firm performance (Teece et al 1997) and a strong intellectual property (Teece 2000; Pisano 2006). The relationship between dynamic capability and the outcomes are mediated by capability development and new product development (Wang & Ahmed 2007). That is, dynamic capabilities determine capability development and guide new product development efforts, which in turn confer beneficial outcomes for the organization. Several variables moderate the relationship between dynamic capabilities and the outcomes. Social capital, the ability of actors to secure benefits by virtue of membership in social networks (Portes 1998), moderates the relationship between dynamic capability and the outcomes (Byler & Coff 2003). Operating capability, defined as capabilities that enable the firm to execute its main operating activities such as making and selling products or delivering services (Helfat & Peteraf 2003; Winter 2003; Zahra et al 2006) is another moderator. Also, environmental conditions like complexity and uncertainty influence the relationship between dynamic capabilities and the outcomes.

While the dynamic capabilities framework enhances our understanding of the phenomenon, it also raises several questions and issues. While the dynamic capabilities view arose in response to addressing the issues faced by the static RBV, it still does not account for the dynamism that is an embodiment of what the market represents. For example, some of the aspects of dynamic capabilities as it pertains to marketing, like the marketing mix capabilities (Dutta, Zbaracki, and Bergen 2003; Vorhies & Morgan 2005), new product development capabilities, market strategy development and execution are still researched and understood as static capabilities. In that sense, even dynamic capability version of RBV is still static. In addition, dynamic capabilities literature

disregards micro level factors like human capacity and willingness for change that influence successful realization of dynamic capabilities. There is no multi-level theory or construct that bridges the gap between micro level factors, like human capital and macro level phenomenon, like dynamic capability.

Absorptive Capacity

While dynamic capabilities have an outward focus, absorptive capacities, on the other hand is more inward focused. Absorptive capacity is regarded as one of the components of dynamic capability (Wang & Ahmed 2007). Absorptive capacity has been defined in the literature in many different ways. But the first definition of absorptive capacity by Cohen and Levinthal (1990) defines absorptive capacity as “the ability to recognize the value of new information, assimilate it, and apply it to commercial ends”. This definition looks not just at the ability to absorb new information, but the ability to apply it for productive and profitable purposes. Zahra and George (2002) provide a slightly modified and refined typology to better understand the concept of absorptive capacity. They classify absorptive capacity into two kinds, namely, potential absorptive capacity and realized absorptive capacity. Potential absorptive capacity consists of knowledge acquisition and knowledge assimilation. Knowledge acquisition refers to a firm’s capability to identify and acquire externally generated knowledge that is critical to its operations (Zahra & George 2002). Knowledge assimilation refers to the firm’s routines and processes that allow it to analyze, process, interpret, and understand the information obtained from external sources (Kim 1997a, 1997b; Szulanski 1996). In contrast to potential absorptive capacity, realized absorptive capacity entails

transformation and exploitation. Transformation denotes a firm's capability to develop and refine the routines that facilitate combining existing knowledge and the newly acquired and assimilated knowledge (Zahra & George 2002). The exploitation element comprises routines that allow firms to refine, extend, and leverage existing competencies or to create new ones by incorporating acquired and transformed knowledge into its operations (Zahra & George 2002). The authors emphasize that for potential absorptive capacity to transform into realized absorptive capacity, social integration mechanisms play a vital role. Social integration mechanisms, both formal and informal, can facilitate the sharing and eventual exploitation of knowledge (Zahra & George 2002). Several authors further added to the definition (Table 4) and understanding of absorptive capacities, but the core of absorptive capacity remains — recognition, assimilation and application towards commercial ends.

Figure 2 provides an overarching framework of all the antecedents and outcomes of absorptive capacity. Table 5 defines the various antecedents, outcomes, and variables that are associated with absorptive capacity.

Several external and internal factors drive absorptive capacity of organizations. External sources of complimentary knowledge (Zahra & George 2002; Kostopoulos et al 2011) that firms procure from acquisitions (Chaudhuri & Tabrizi 1999), licensing and contractual purchasing agreements (Granstrand & Sjolander 1990), other inter organizational relationships, like R&D consortia, alliances and joint ventures (Vermeulen & Barkema 2001); and inter organizational networks (Tsai 2001) influence absorptive capacity. In addition, internal organizational factors like experience (Zahra & George 2002), socialization among employees (Jansen et al 2005), informal networks (Zahra &

George 2002), internal communication (Cohen & Levinthal 1990), managerial capabilities, like cognition, accountability, knowledge sharing (Van Wijk et al 2001) determine absorptive capacity. In addition, all the things that an organization knows, like memory (Jansen et al 2005), technical and market knowledge, breadth and depth of knowledge (Van Wijk et al 2001) also drive absorptive capacity. Absorptive capacity leads to several beneficial outcomes for the organization, like competitive advantage (Zahra & George 2002), innovation (Zahra & George 2002; Lichtenthaler 2009; Chen et al 2009; Kostopoulos et al 2011), strategic flexibility (Zahra & George 2002), increased financial performance (Zahra & George 2002; Lichtenthaler 2009; Kostopoulos et al 2011), reduced barriers in international markets (Harris & Cher Li 2008), and reduced cognitive proximity between firms (de Jong & Freel 2010). In many cases, the effect of absorptive capacity on the outcomes is moderated by a variety of variables.

Appropriability regimes, that is, the institutional and industry dynamics that affect the firm's ability to protect the advantages of (and benefit from) new products or processes (Antonelli 1999) influences the relationship between absorptive capacity and the outcomes (Zahra & George 2002). In addition, technological turbulence (Lichtenthaler 2009) defined as the rate of technological change (Jaworski & Kohli 1993; Lichtenthaler & Ernst 2007) and market turbulence, defined as the degree of instability and uncertainty within a firm's markets (Helfat et al 2007; Jaworski & Kohli 1993) are other factors that moderate the relationship between absorptive capacity and the outcomes. When an organization outsources its technology needs, or is exposed to situations of involuntary knowledge flows, like "leaks" (Dumont & Meeusen 2000), it is generally agreed that such knowledge flows confer positive outcomes for the organization in terms of better

financial performance, competitive advantage and innovation. But these beneficial effects are realized only when the organization has the capacity to absorb the knowledge from the environment.

Cohen and Levinthal (1990) and others discuss the role and importance of individual level absorptive capacity in building organizational level absorptive capacity. While there is increasing acknowledgment of the role of human capital, most studies on absorptive capacity conceptualize and operationalize absorptive capacity at the organizational level. Cohen and Levinthal themselves argue that operationalizing absorptive capacity as the R&D expense of a firm would suffice (Cohen & Levinthal 1990; King et al 2008; Rothaermel & Alexandre 2009). While this implicitly takes into account the individual level absorptive capacities, it ignores the fact that individuals have agency and may choose not to engage in interaction or communication with other entities. This communication and interaction among individual members is critical for building organizational level absorptive capacity (Cohen & Levinthal 1990; Zahra & George 2002). The individual member's agency and choice to communicate or not, to interact or not, limits both the individual level and organizational level absorptive capacity. The theory on absorptive capacity currently does not make allowance for the role of micro level actors like human capital and resources individually, and in interaction as a driver of organizational level absorptive capacity. It is conceptualized predominantly at the organizational level or the business unit level. While there is agreement that the lowest level at which absorptive capacity can be studied is at the level of the individual (Cohen & Levinthal 1990; Van den Bosch et al 2003), there is not much research that examines absorptive capacity at that level. Scholars suggest that the link between learning and

absorptive capacity is most evident at the individual level (Van den Bosch et al 2003), and that the effects of individual level absorptive capacity manifests at the organizational or collective level (Cohen & Levinthal 1990), yet there is paucity of research that examines and conceptualizes absorptive capacity as a multi-level construct.

CONCLUSION

The literature on dynamic capabilities, absorptive capacity and other kinds of capabilities like strategic capability, learning capability, operational capability, adaptive capability, innovative capability etc. suffer from similar shortcomings. They are conceptualized at the organizational level. While they acknowledge that resources are varied and heterogeneous in nature, and interactions among these resources are vital for the realization of these capabilities, they are studied as static entities and do not account for the agency of the resources that make interactions possible or not. Hence, drawing from Assemblage Theory and Social Network theory, I propose the concept of “capacities” of entities as a way to understand the role of micro level actors in building macro level phenomenon and outcomes.

All resources, tangible and intangible, possess capacities to interact with other entities or actors. While they have the potential and the capacity to interact, they do not always interact with each other. Capacities, therefore, are a potential that the components or actors can choose to realize or not realize. They emerge only when actors come into contact with other actors with whom they can interact. Until this relation is formed, capacity merely remains a potential (DeLanda 2006). While individual resources like

employees possess agency, capacities speak to the notion of joint agency of actors in interaction. Hence, the outcomes of interactions among actors depend on what capacities they chose to exercise. Capacities are different from resources and capabilities. Resources represent a closed list of things that organizations possess, like brands, intellectual property, facilities, employees and other tangible and intangible assets that helps firms generate rents (Day 2011; Ambrosini et al 2009). In contrast, capacities represent an open list, as the outcome of an interaction among the actors depends on what capacities the actors chose to exercise. In other words, the outcome depends on the joint capacity exercised by the entities. Capacities are also different from capabilities. All the different types of capabilities, like dynamic capability and other types of organizational capabilities are conceptualized at the organizational level and deal with deployment of resources and resource combinations towards a specific objective. The capabilities view assumes that organizations have the agency to deploy and redeploy resources in any way that benefits the organization. It fails to take into account the agency of resources, like human capital, that may react differently, thereby limiting the ability of the organization to realize any change, growth or competitive advantage.

Therefore, the notion of “capacities” addresses some of the issues and gaps in the capabilities and absorptive capacities literature. It provides the much needed multi-level framework that links the micro level factors to macro level outcomes, like, the role of individual actors or entities in the building of organizational level capabilities. In addition, capacities also take into account interactions of entities or resources with one another and the role of joint agency in determining the macro level outcomes for organizations and other such collectives.

The two essays that follow in my dissertation are exploratory studies that build on and draw from this notion of capacities. The first essay looks at capacities of salespeople that represent cosmetic brands in department stores in the US, and the capacities of other entities in the context, namely, cosmetic brands and the department stores, in fostering either cooperative or competitive behavior. The second essay of my dissertation looks at the capacity of inventors (of patents) to interact with other inventors and patents in Biotechnology industry in the event of an acquisition, and the outcome of this interaction on organizational innovation subsequent to the acquisition.

CHAPTER 2: ESSAY 1 – COOPETITION IN AN EMBEDDED RETAIL SALES ASSEMBLAGE

The objective of this research is to uncover the dynamics of cooperation and competition among salespeople who represent different manufacturers but work for the same retailer. Specifically, I investigate cooperative and competitive relations among cosmetics representatives of various brands like Estee Lauder, Clinique, Christian Dior, Lancôme etc. located within the cosmetics section of large department stores like Macy's, Dillard's, Sax 5th Avenue and so on. By examining how individual salespeople are embedded within a brand, sales counter-space, cosmetics area and department store, I uncover a micro-analysis of processes across multiple levels of embeddedness that shape whether and how salespeople compete or cooperate with each other, and how they identify and engage with the goals of the cosmetics area, brands they represent, department store and customers.

My research contributes answers at the intersection of two important marketing problems. First, what are the special challenges of embedded sales forces and how can marketing organizations best support their multiplicity of goals and loyalties (Bradford et al 2010). Second, how can we examine, understand and potentially predict cooperative and competitive dynamics among manufacturers and retailers within a supply chain (Kim et al 2013). I employ a multi-level network analysis to address these questions.

Theory and research identifies the need for a multilevel network perspective for understanding salesforce dynamics in organizations (Brass et al 2004; Lusch, Vargo and Tanniru 2010; Uzzi 1996; Uzzi 1997; Vinhas, Heide and Jap 2012). However, to date there are only a few examples of multi-level analysis (Ghosh and John 2005; Wathne and

Heide 2004). Hence, at contrast with most research, I explicitly focus on a multi-level analysis that examines the many ways that particular salespeople are embedded and how processes and relations among actors affect cooperative and competitive relations at the store and brand level, with implications for customer service and satisfaction (Mishra, Heide, and Cort 1998). I also make a theoretical contribution to understanding the dynamics of competition and cooperation within an embedded sales force by introducing a new theoretical lens for interpretation. To uncover the dynamics of cooperation and competition requires a network lens for examining shifting alliances and network capacities. Assemblage theory is one important possible lens for understanding actor network dynamics in a multi-level system (Delanda 2006; Deleuze and Guattari 1987; Sassen 2006). Marketing scholars have only recently begun to draw on assemblage theory and actor network dynamics as a way of understanding dynamic and complex alliances among entities (Canniford and Shankar 2013; Epp and Price 2011; Epp, Schau and Price 2013; Lury 2009; Thomas, Price and Schau 2013; Price 2013). This is the first attempt to apply assemblage theory to understand cooperative and competitive relations among actors within a supply chain. Moreover, although implicit, this study contributes to assemblage theory by extending the theory to better explicate how it accounts for competitive and cooperative dynamics among entities.

In what follows, I first review the literature on coopetition and identify issues and gaps, and discuss how my research addresses these issues and extends coopetition research. Second, I provide a detailed analysis of Assemblage and Actor Network Theory. Then, I discuss my research context and methodology. Finally, I discuss my

findings and demonstrate how embeddedness affects customer service and suggest recommendations to brand and store managers.

THEORETICAL BACKGROUND

Coopetition

Coopetition, generally defined as existence of simultaneous cooperative and competitive relationship among entities or organizations, entails dual and opposing aspects of both cooperation and competition. Prior literature deals with several different aspects of cooperation, like knowledge sharing among organizations, collective use of shared knowledge for the purpose of making joint gains (Tsai 2002; Khanna et al 1998), and a collective effort towards building a mutually beneficial and profitable long term relationship with one another (Hakansson and Ostberg 1976; Borg 1991). In contrast, the competitive aspect signifies coopetiting organizations trying to outperform one another by using the shared knowledge for their private gains (Khanna et al 1998), and attempting to create rent through value appropriation mechanisms (Dagnino and Padula 2002). Based on earlier work, while cooperation can be classified as collective intent versus collective action of entities, I adopt a “collective action” perspective. Those is, when organizations regard themselves as part of a collective, and take actions that benefit the collective, which is a group of organizations that have come together for a purpose, they are involved in cooperative behavior. Similarly, competition can be classified as an intention to make a private gain and outperform others versus an actual act to make

private gain at the expense of the collective. As with cooperation, I adopt an action perspective with competition. That is, when organizations act for the betterment of their own organization or for their private gain instead of the collective, and try to outperform other organizations, they are engaged in “competitive behavior”.

Coopetition is regarded as a dynamic process (Luo 2007), as the dual aspects of cooperation and competition vary, that is, it increases or decreases with time and varying situations. While competitive threats from other firms in the industry, higher levels of interdependence among firms (Luo 2007; Bengtsson and Kock 2000), greater investment in transaction specific assets (Dowling et al 1996), increased need for strategic flexibility (Luo 2007), increased consumer demand, increased hazards from institutional environments, and inter organizational attachment (Luo 2007), increase the cooperative aspect; overlapping and competing goals, and decreased resource dependency increase the competitive aspect. Therefore, prior literature suggests, the balance between cooperation and competition is influenced by a strategic, long term and economic orientation on part of the coopeting organizations. In contrast to prior literature, I demonstrate that the balance between cooperation and competition can be influenced by factors that are neither strategic nor based on economic variables at the organizational level. In fact, processes internally employed by organizations, like the social factors, friendships etc. determine whether there will be cooperation or competition with other organizations. This research addresses some of the concerns raised in coopetition literature (Walley 2007) and provides a new typology to understand coopetitive relations among organizations.

It has been agreed in the coopetition literature that coopetition can occur at different levels - corporate, division, or subsidiary levels (Luo 2007). I examine coopetition at yet another level - at the level of embedded salesforce. Embedded salesforce is salesforce that is relationally rooted within multiple organizations. A salesperson that is relationally rooted within multiple organizations, has obligations and responsibilities towards both these organizations. This presents the embedded salesforce with a wide range of issues — one of the major issues being, the effect of this embeddedness on cooperative or competitive behavior of the salesforce among themselves. Using theoretical lens from Assemblage Theory and Actor Network Theory, I enumerate on factors that drive cooperative or competitive behavior of the embedded salesforce.

Research on coopetition, so far, has identified several beneficial outcomes of coopetition for the coopeting organizations. Some of the benefits stated in the literature are - firm survival (Bonel and Rocco 2007; Rusko 2011), knowledge growth (Dagnino and Padula 2002), increased revenues and decreased costs (Dagnino and Padula 2002; Ingram and Roberts 2000; Peng et al 2012), joint benefits (Kim et al 2013), and faster returns on investment (Peng et al 2012). While all these outcomes focus on the benefits of coopetition for the organizations concerned, there is no research that looks at the effect of coopetition on the consumer (Walley 2007). Do consumers benefit when organizations cooperate? Or do consumers suffer? This is one of the first research that examines the effect of coopetition on customer service and satisfaction related outcomes.

ASSEMBLAGE THEORY

Assemblage theory describes dynamic forces and shifting alliances among diverse actors within complex multi-level systems. Most directly inspired by the work of Gilles Deleuze, it is also linked to new approaches to management practice, political ecology, identity and materiality (Stormer 2010; Connolly 2005; Coole and Frost 2010; Delanda 2006; Deleuze and Guattari 1987; Hickey-Moody and Malins 2007; Law 1992; Latour 2005; Sassen 2006; Sellar 2009). Marketing scholars have only recently begun to draw on assemblage theory and actor network dynamics as a way of understanding dynamic and complex alliances among entities (Lury 2009; Canniford and Shankar 2013; Epp and Price 2011; Thomas, Price and Schau 2013; Price 2013).

An assemblage is a whole or a collective comprised of heterogeneous components or actors. It includes both human and non-human actors that interact and have the potential to interact with one another (DeLanda 2006; Van Wezemaal 2008; Sellar 2009). For example, within the cosmetics section of a department store like Macy's, Dillard's and Nordstrom, we observe several brands of cosmetics, like Clinique, Estee Lauder, Lancôme, Shiseido and so on. A Clinique assemblage here, for instance, comprises of several heterogeneous components — the salespeople with their inherently different capacities, skills and resources, the counter space, the glass cases that holds cosmetics, the chairs, the various cosmetic items, their work schedules etc. These components that comprise the Clinique assemblage, are bound by relations of exteriority. That is, any component part has the capacity to function independently outside the assemblage. They retain some autonomy from the whole, of which they are a part. Therefore, any component part can at any time detach or decouple from an assemblage and assemble

into a different assemblage. For example, people that are part of a social group can decouple from that group and attach themselves to another group. A component, in many cases, is embedded within multiple assemblages. For example, the sales representative in the department store, representing Clinique brand of cosmetics, is embedded in Clinique assemblage, the department store assemblage, and her social assemblage of friends and family to name a few. While human actors possess more agency to decouple and couple into different assemblages, non-human actors are in many cases used by human actors to facilitate their coupling or decoupling behavior. Hence, non-human actors, while they possess considerably lesser agency than human actors to couple and decouple, they do have the potential to change the nature of interactions of actors surrounding them.

The varied components of an assemblage possess capacities to interact with each other. While they can certainly interact with one another, it does not always mean that they do. Capacities, therefore, are a potential that could be exercised by the components or actors. They emerge only when actors come into contact with other actors with whom they can interact, and until this relation is formed, it merely remains a potential (DeLanda 2006). For example, while all organizations possess data about customers, sales and several other aspects of business they are involved in, not all organizations excel in harnessing effective data to generate meaningful insights that improve their businesses. Only a few organizations are successful in effectively analyzing and interpreting data. While the data and employees are resources that all organizations possess, in order for data analysis and interpretation to become capabilities that can help the organizations excel, good analysts are necessary. Different analysts interact with data differently, and some interactions yield successful insights while others do not. Hence, this capacity for

analysts and data to interact with each other is important for an organization. This potential to interact represents the capacities of the actors concerned. Capacities provide the much needed link that can help organizations to cultivate and convert their resources into capabilities. While resources possessed by an entity, which represents a limited and closed list, can influence capacities of entities to interact to some extent, actual realization of the capacity happens only when the entity forms a relationship with another entity. Capacities, therefore, unlike resources, represent an open list, as the result of any interaction between two actors could have varied outcomes depending on what capacities they chose to exercise (Sassen 2006). Capacities can be more material or expressive. Material capacities facilitate realization of capacities through interaction of or with material resources, like structural resources, skills and knowledge etc. In contrast expressive capacities facilitate realization of capacities through exchange of expressions or emotions or any act with another actor that establishes a bond. For example, skills or knowledge of a sales person (material capacity) may interact with the requirements of a customer base in unique ways to enhance capacity within that relationship but not others. Similarly, the emotional tone, gestures and facial expressions of a sales person (expressive capacity) may enhance their cooperative or competitive relations with other sales people. Similarly, non-human components such as incentive plans (expressive capacity) and other institutional features, or structural arrangements (material capacity) may affect different sets of relations, like cooperative or competitive relations within an assemblage.

Since exteriority of relations is one of the key characteristics of components within an assemblage, an assemblage uses its capacities to territorialize the various

components within it. Territorializing process can involve setting spatial or non-spatial boundaries. The spatial and non-spatial boundaries are important to the extent they succeed in keeping its components together. An assemblage could set spatial boundaries by specifying the physical space within which its components should be and interact; or it could use non-spatial processes that aim to either increase the internal homogeneity within an assemblage or increase the sharpness of boundaries, such that the components stay within the territories of the assemblage. Organizational assemblages, for instance, territorialize its employees spatially by setting a physical boundary for its organization, and by employing non-spatial processes, like socialization among employees, to strengthen the identity of the assemblage. These processes synthesize an assemblage and provide an assemblage with a dimension (Sellar 2009). While assemblages are involved in the process of territorializing its components, several other processes, at the same time, deterritorialize the components. These deterritorializing processes, in contrast with territorializing processes, increase the internal heterogeneity among components, thereby destabilizing the assemblage.

This research context with its focus on embedded sales force is ideal for exploring the dynamics of multiple assemblages, their components and capacities, and the processes employed by the assemblages. While this context focuses specifically on the cosmetics section of a department store and the complex tug and pull of the department store and cosmetics brands on the affiliations and capacities of other actors, I expect that these dynamics are in evidence within any embedded relationship and contribute to the efficacy of emergent relations and firm performance. This framework helps us understand cooperation using a completely different perspective from past approaches. I examine

various territorializing processes along with capacities of entities to decouple and couple to demonstrate the evolution of cooperative and competitive processes.

RESEARCH CONTEXT

I chose cosmetics and fragrances section of department stores in the US. The salesforce that is commonly observed in this section of the department store is embedded within multiple different assemblages, namely, brand assemblage, store assemblage, cosmetics department assemblage. This provides me an opportunity to understand embedded sales force, where I can observe the dynamics of actor alliances across multiple assemblages, and investigate the effects of shifts in alliances on cooperative and competitive behavior of cosmetics representatives.

Two powerful assemblages, among others, in this context, are the assemblages of the brands and store, within which the sales people are relationally rooted and thereby embedded. Sales representatives for cosmetic brands are recruited jointly by the department store and the cosmetic brand, and their sales commissions are paid jointly by the store and the brand. They are embedded within both store and brand assemblages, with the intent that they will embody the principles and philosophies of both organizations. They have loyalties and associations, and contribute to the profits, sales, and performance of both the organizations. They experience territorializing processes from both the store and brands. While these territorializing processes are engaged by the assemblages based on assemblage capacities, how a component within the assemblage responds to these processes is determined by the component's capacities.

The embeddedness of salesforce, in this context, provides an excellent avenue to

understand how the capacities they choose to exercise, affects the way they experience territorializing and deterritorializing processes employed by not one, but multiple different and competing organizational assemblages. It further helps us understand the effect of these processes in fostering either cooperative or competitive behavior in the embedded salesforce, thereby providing a novel framework to understand coopetition.

Throughout the entire research process, the embedded sales people repeatedly emphasized the uniqueness of the cosmetics department from other departments within the store. Debra, a Clarins representative states that she worked for fine jewelry and clothing, but she observes that it was much more friendly in jewelry and clothing, and “it was not this competition.” Sarah, who works in handbags, voices the sentiment that the cosmetics and fragrances section is unique and holds great appeal to sales people from the rest of the store, noting, “Everybody wants to work in cosmetics, because it is very prestigious and the commission is much, much higher, but the dynamics work differently because there’s this strong brand presence there.”

METHODOLOGY

With the objective of understanding the dynamics of embedded sales force, I conducted several forms of exploratory research. I gathered insights and data from several entities that have an influence on the embedded salesforce. I first conducted preliminary interviews with two store managers from different department stores to understand their perception on interactions among embedded sales people in the cosmetics section. I used these preliminary interviews as a guide to understand the role played by goals, commission structures, training programs, and recruitment processes

employed by stores and cosmetic brands. In addition, I conducted an interview with a senior executive in Estee Lauder to better understand the nature of brand relationships with department stores, with other competing cosmetic brands, and with their sales representatives.

With approval from the store managers, I made passive direct observations on the nature of interaction of salespeople both within and outside the cosmetics section of department stores, in four different store locations. I also observed the patterns of movement of sales people from one brand to another, from one department to another, and from one store to another. In addition, I made inferences about the capacities of different actors in the cosmetics section, and how it influenced the processes employed by the department stores and cosmetic brands, and components' response to these processes.

I conducted brief interviews with seven sales representatives at the fragrances and cosmetics section at department stores and arrived at insights on the dynamics that are at play. I used these insights to further refine questions for depth interviews with embedded sales force at a major department store. I conducted depth interviews with a total of 14 sales associates/ brand representatives and counter managers for various cosmetic brands in a prominent department store in the Southwest part of US. Each interview lasted between 45 minutes to an hour. To compare the cosmetics and fragrances department with the rest of the store, I also interviewed one sales person from another department in the store.

I analyzed interview transcripts and field notes following Strauss and Corbin's (1990) procedures. I analyzed each transcript, and set of field notes individually and then

began open and axial coding. I uncovered important themes using an iterative back-and-forth reading process, uncovering patterns within and between informants, and within and between data sets (Spiggle 1994; Thompson 1997). The research process sought cross-validation among researchers, and member-check procedures were used to audit theoretical interpretations and representations (Fischer and Otnes 2006; Thompson 1997).

In addition, in order to understand the implication of embedded salesforce on customer service and satisfaction outcomes, I surveyed 70 customers that recently shopped for cosmetics in department stores.

FINDINGS

Overview of Findings

The cosmetics employees, counters and brands are nested within the department store, within the mall, within the broader socio-cultural assemblage of cosmetics, cosmetics brands and department store brands. The findings, overviewed in Figure 1 and described next, show how and why cooperation and competition operates within this retail assemblage.

First, I illustrate differences in capacities of various individual components within an assemblage, and the assemblage itself. Second, I uncover the connection between the capacities of assemblages and the territorializing or deterritorializing processes employed by these assemblages. In addition, I also demonstrate the connection between capacities of individual components and how it influences and determines their response to territorializing or deterritorializing processes they are subjected to. Finally, I uncover the

role of these territorializing and deterritorializing processes on cooperative or competitive behavior of the embedded salesforce. Understanding the implications of these behaviors for cosmetics department growth and continuity, and better customer service and satisfaction, requires an understanding of how actor and assemblage capacities are implicated by these fluid assemblages. Together, these findings set the stage for a closer examination of the evolving dynamics of cooperation and competition within this context. I focus in the next portion of results on two significant interlocking dynamics: (1) assemblage and actor capacities that influence the territorializing processes assemblages engage in; and (2) competitive and cooperative processes that evolve from the interplay of incompatible processes among store, brand and cosmetics assemblages. The multiplicity of assemblages in interplay creates both threats and opportunities for the profitability and growth of cosmetics, brands and the store. Ultimately, actor and assemblage capacities affect their response to disruptions caused by fluctuating alliances and drive the evolution of competition and cooperation within this context. My findings have broad implications for how we understand these constructs and their consequences for embedded sales forces in other business contexts.

Actor and Assemblage Capacities

As mentioned briefly in earlier sections, actors and assemblages possess potential material and expressive capacities that are realized in interaction. These range on a continuum. Material capacities are stocks of resources. Resources here could be time and energy spent in maintaining relations, knowledge base of the actors, equipment, and other resources that can be used to reinforce behaviors. In this context, an indication of material

capacity could be the sales level of a brand, and how well known the brand is. While these might seemingly represent simple sales outcomes, they have a potential to elicit different responses from the various actors, like customers, representatives of that assemblage, store managers etc. They influence interaction among actors, like representatives and customers. Hence, since it represents and influences potential interaction, they are regarded as material capacities. In contrast, expressive capacities facilitate “flow” of communication, knowledge, information, and cooperative relationships within the system. This could be accomplished by simple use of words or other non-linguistic acts that display solidarity and trust, social norms, general beliefs, and serve as a badge of identity. One form of expressive capacity might be how well the actor manages to keep the assemblage integrated and intact by displaying a notion of solidarity among its actors. Each actor, both human and non-human, has some level of potential material and some level of expressive capacity. The differences in actor capacities are a crucial factor contributing to the heterogeneity of the assemblage, and influence an actor’s ability to form relational alliances with other actors and assemblages. As illustrated in Figure 1, the capacities of actors and assemblages influence the structure and composition of the cosmetic assemblage. When heterogeneous actors interact, it affects and changes the capacities of not just the assemblage but of the individual actors that comprise the assemblage.

Table 6 selectively illustrates material and expressive capacities of different actor-assemblages. Each actor has some element of potential material and expressive capacity. In the course of the interviews, I uncovered some of the material and expressive capacities of different level of actors. As elaborated in the earlier section and highlighted

in Table 3, Vera, a representative of Clarins, observes that Clarins as a brand has low material capacity while Estee Lauder has high material capacity on account of size and sales of the two brands. She also comments that Chanel has low expressive capacity as it was unable to create a sense of identity among its representatives. In contrast, Nina observes that “Clinique is a wonderful brand; we are always going to have customers for Clinique”. This is the only brand she has represented and she mentions her love for the brand, and how she would never represent another brand. So at least in this cosmetics assemblage Clinique has done an excellent job of creating a strong sense of identity and solidarity among its representatives, indicative of high expressive capacity.

The department store is a crucial actor in this setting. It’s potential material and expressive capacity depends on the capacities of component actors as well as other assemblages that it interacts with. As illustrated in Table 6, Heather, a Clinique representative observes, that Macy’s pays her “a slightly less commission” when she sells something other than Clinique. This hints at Macy’s lower material capacity relative to Clinique’s capacity in this context. But in a completely different context, Heather observes that since she is a “Macy’s employee”, she needs to meet Macy’s goals in order for her “to get a raise or promotion or something”. This indicates Macy’s material capacity to use strong mechanisms to reinforce desired behaviors among its employees. Miriam, also a Clinique representative, observes that she “feels like a number” in Macy’s. She is upset over the fact that no one in Macy’s bothers to know her as a person, because of which she mentions, she might choose to move up in Clinique if she gets an opportunity, but not in Macy’s. Macy’s in this case, demonstrates a low expressive capacity relative to Clinique, since it is unable to create the sense of pride and identity in

employees like Miriam, who are waiting for a chance to leave the organization. In contrast, Marianna, who has been with Macy's about 15 years and has coupled and decoupled from a number of different cosmetics brands during that time, is very pleased with everything Macy's has done. She mentions that the managers will give them "little notes" of acknowledgement when they see the employees doing something good, or being really helpful to someone. She also mentions many instances where she believes Macy's is doing something good to the employees that other stores normally wouldn't. In this context, Macy's displays a high expressive capacity among employees that feel bound to the store, rather than a brand assemblage.

Just as cosmetic brands and stores are actors with varying levels of material and expressive capacities, individual actors in the assemblage also have different levels of material and expressive capacities. When Vera, a then Estee Lauder representative or Miriam, a Clinique representative, need to divide their loyalties between work and personal commitments, it indicates an instance of low material capacity. But Vera demonstrates high material capacity by speaking 4 different languages, simply by possessing more skills and knowledge than her co-workers. Just as some actors possess material capacities, others or even the same actors might also possess expressive capacities. Vera's interpersonal issues with the Estee Lauder counter manager indicate a low expressive capacity of the counter manager, as she could not keep her representatives together. In contrast, Nina, a Clinique representative, who feels "more like a counselor sometimes" as she constantly tries to eliminate friction and tensions among her counter members hints at a higher expressive capacity.

Beyond the store, brand and cosmetics representatives, there are other human and non-human actors that possess material and/or expressive capacities. Ironically, the cosmetics customer has comparatively low expressive capacity and agency in this setting compared to other parts of the department store. Miriam, an Elizabeth Arden representative mentions that when a customer comes in not knowing what brand or product she wants, she would try to see if the customer “seems open to it”. She then goes on to say that every once in a while she gets a “difficult customer” but she states she just has to “let it roll off her back” and not let customers bother her. Customers and the related goal of good customer service, in this case, has a lower expressive capacity as the employee’s specific product knowledge and incentives are organized around the brand she represents. But when a customer comes in who has multiple loyalties towards a variety of brands, there is no incentive for the employee to serve the customer.

Counter space is a particularly interesting non-human actor in this setting because of the way that it can potentially gather competitors together within the same counter space, keep them apart and separate customers from representatives. Miriam, a Clinique representative mentions that operational things like “arranging cases, and making sure everything is in the drawer” and that the counter is “clean” are also just as much a part of their jobs as is selling. But counter space, as an actor has a low material capacity when there are people “that are only eager to sell” and “not do other things at the counter”. But the same counter space, attains a higher material capacity, when Nina, the Clinique counter manager assigns “areas of pride”, basically areas that each rep is in charge of, since counter space then warrants the employees time, attention, and involvement. Several other non-human actors have a potentially high expressive capacity. For example,

commissions and social norms, both non-human actors have potentially high expressive capacities. Heather, a Clinique representative states that they try not to sell products from other counters “because those girls need their commission”. Miriam, another Clinique representative, talks about social norms that are prevalent in cosmetics. She says she could ring up products from other counters for herself but she would not do it because “we all have a lot of respect for each other”. In both these cases, commissions and social norms can be mobilized to create a strong sense of community within the cosmetics assemblage and play an expressive role that may circumvent brand and store intentions.

Territorializing Processes and Assemblage Disruption

Assemblages can be understood in terms of material and expressive capacities described above and in terms of dynamic stabilizing and destabilizing processes. A central tenet of the natural world is that the potential capacity of an assemblage to integrate heterogeneity and assert stabilizing and territorializing processes will drive whether it survives and grows or disintegrates and collapses (Pascale, Millemann and Gioja 2000; Taleb 2012; Thomas et al. 2013). That is, if the assemblage fails to embrace difference and change it will grow stale and irrelevant, however, embracing difference and change is inherently disruptive and destabilizing. Hence, successful organizational units must have the capacity to both interact with changing and diverse entities and then stabilize and territorialize these differences to avoid fragmentation and demise. This balancing act is further complicated when sales people are simultaneously vital actors in two competing and cooperating entities (the brand assemblage and the department store) and commonly housed within a third assemblage (the cosmetics area of the store).

Present applications of assemblage theory have generally not addressed interlocking assemblages such as an embedded sales force and the implications for competition and cooperation among component parts. Nevertheless such interlocking assemblages are common in nature and cooperation “allows multiple agendas to coexist, and at times, flourish,” (Pascale et al., loc 1854). Competition between assemblages, like conflict, has the effect of sharpening the boundaries between insiders and outsiders, as such it can contribute to the identity and solidarity of a community—for example, the brand, the department store or the cosmetics area at contrast with the rest of the store. However, this kind of solidarity comes at a price since it results in practices of social exclusion, reduced actor autonomy and restricted social mobility between assemblages (Delanda, p. 58). Thus, what is needed is a balance of competition and cooperation. How to insure this balance, given the respective territorializing processes of strong cosmetics brands and strong department stores, is problematic. The embedded sales force, as a unique entity in service to both these assemblages, may have the least material and expressive capacity to create a unity and identity that transcends that of either a particular cosmetics brand or the store. However, as indicated in the earlier section on capacities, social norms and personal relationships among cosmetics representatives can function to stabilize and unify this assemblage.

At every assemblage level (store, cosmetics, counter and brand) there is coupling and decoupling (such as adding a new cosmetics representative behind the counter of a brand assemblage, or creating a new counter arrangement within the cosmetics assemblage) that disrupts and destabilizes the pattern of relations and plays a destabilizing role. I also observed emergent capacities within assemblages such as

interpersonal frictions and personality clashes that caused disruption and destabilized the unity and identity of the groups. At the same time we see efforts by brands, stores and the cosmetics area to sharpen their boundaries and clarify their identity in order to stabilize and territorialize actor relations. The interplay of these assemblage territorializing processes has unintended consequences for the competitive and cooperative relations among their shared component parts. For example, the capacity of a cosmetics brand to create a sense of unity and belongingness through training and shared goals, may diminish the capacity of the store assemblage to engage participants in their community and goals. In general territorializing processes enable internally cooperative behavior emphasizing the “we” and collective identity of the assemblage. As a result, the entities within that assemblage form a unified group, cooperating with each other, but, absent territorializing processes at other levels, this may lead to competition between assemblages. For example, if actors feel they must choose between incompatible store and brand goals, training programs or practices this destabilizes the unity and identity of the embedded sales force and members are pulled to adhere with either the store or the brand. Actors are pulled back and forth depending on the respective assemblage capacities. Alternatively, if territorializing processes are exerted at a different level—that of the nascent embedded sales force collective, this can contribute to cooperation among brands and the department store and lead to a sense of belonging for actors at each assemblage level. Some processes employed by different actors that might lead to cooperative or competitive behavior among actors within assemblages are discussed below and summarized in Table 7. Below, I describe how the primary actors of brands and stores use goals, commissions, training programs and particular practices to

territorialize and unify particular assemblages and how these may backfire or interplay to disrupt and destabilize assemblages.

The brands design training programs as a “get-away” experience for representatives. As Nina, a Clinique representative states, “They put us in a store, they pay for our food, the night out, and then the next day they pay for our food as well. It is like a small get away. It is kind of nice.” She also goes on further to say that through these training programs that lasts for a couple of days, she has established friendships with Clinique representatives in a competing store. She mentions that when they run out of products that their customer wants, she feels comfortable referring her customers to the Clinique representative in the competing store, on account of friendships they established during training programs. Marianna, an Elizabeth Arden representative voices a similar opinion about the brand training she receives from Elizabeth Arden. The brands design training programs away from the store for 2 to 3 days, where the representatives socialize and bond together and experience a sense of belongingness with the brand. It gives them a chance to identify and associate with the brand. The brand uses training as a territorializing process to sharpen its boundaries and build loyalty and unity within the brand. The loyalty and bonding that Marianna and Nina feel towards their brand is evident from their career trajectory as they see themselves growing with the brand instead of the store. In addition, brands set rewards and commissions such that representatives get high incentives and rewards when they meet their goals. Miriam, a Clinique representative is excited about the rewards she gets from Clinique every four months in the form of “money to get skin care online.” This provides a strong incentive to stay within and benefit from the brand assemblage. In contrast Sarah, who works in handbags

mentions with a hint of annoyance that the only reward she gets from Macy's is a \$10 gift card if she meets her goals consistently three or four times in a row. So brand uses rewards as a strong territorializing process to attract and retain sales people. Similarly brands pay a higher rate of commissions on sales of their brand by their sales representatives, which inhibits cross-selling of brands.. Miriam, a Clinique representative states that if she sold any other brand, she gets much less commission. So brand commissions territorialize sales people within the brand assemblage, but contributing to competition between brands and within the cosmetics assemblage. Similarly, brands use other practices to build employee loyalty. Simple appreciation and recognition plays a huge role for Blanca, a Dior representative, in forging a strong bond with Dior. These and other territorializing processes are used by brands to sharpen boundaries so representatives will unite and cooperate within the brand and compete against other brands.

Stores, similar to brands use territorializing processes to build employee loyalty toward the store. They use training programs, commission structures and other practices to achieve this end. Miriam, a Clinique representative, and Iris, an Estee Lauder representative mention the usefulness and timeliness of training programs by the store. Miriam's training started right after her recruitment, and it was to help her learn the basics like using a register, and just "getting to know what the store is all about". Iris states that they have "training constantly" and it helps them learn "how to talk to customers, how to get information from them, and how to make them comfortable". These training programs in addition to familiarizing sales people with the store, gives them a chance to continuously learn and stay in touch with the principles of the store. It

territorializes sales people within the store assemblage, such that, all the employees within the store irrespective of the brand they represent identify themselves with the store. In addition to training, stores design commissions such that the embedded sales people would get some percentage of commission, even if not the full commission for any product they sell from other parts of the store. Marianna, an Elizabeth Arden representative feels grateful to the store as she gets the “same commission” from the store for anything she sells. She also mentions the acknowledgements and “little notes” she receives from managers when they see her doing “something good and being really helpful to someone” and talks about the store fondly as a result. The stores use acknowledgements, commissions, and training programs among other measures to territorialize the embedded sales force and the rest of the store. In addition, Mica, an on-call person states that the store used to organize potlucks in order to facilitate bonding and socializing. She observed about the potlucks “That would break the ice and keep the communication lines open”. She also mentions it played a huge role in enabling friendships and mitigating grudges. The store uses such territorializing processes to sharpen its boundaries, such that all departments and sales people within the store would identify themselves as a collective and work together toward better store performance by effectively serving customers.

The territorializing processes by the store tries to homogenize all differences and frictions within the store. But within these store boundaries are brands that implement their own territorializing processes to foster effective competition with other brands. The store territorialization process diminishes the effect of the brand territorialization process. Similarly, strong brand territorialization process prevents sales person engagement with

the store assemblage or other assemblages, thereby mitigating some of the effect of the store territorialization process. The embedded sales force that is trying to imbibe the philosophies of both these organizations, is pulled back and forth as a result, causing them immense frustration and stress as voiced by Marianna, an Elizabeth Arden representative.

Cooperation and Competition in Embedded Sales Forces

I proposed a new framework summarized in Figure 1 that draws from actor-network and assemblage theory to understand factors that determine cooperative and competitive behavior among embedded sales people. I illustrated that in the cosmetics section of department stores the embedded sales force is often caught in the tug and pull of various territorializing processes of cosmetics brands and the department store. The physical boundaries of the cosmetics section as well as certain unique norms and privileges that apply in this section of the department store could help create an identity with the potential capacity to unify heterogeneous actors in pursuit of the mutual goals of serving the customer while representing both a particular brand and the department store. At the same time the department store and cosmetics brands are viewed by the sales force as employing competing and incompatible territorializing processes that serve to disrupt and destabilize the identity of the embedded sales force. Moreover, the brands and department store assemblages have far more material and expressive resources available than the embedded sales force in order to affect actor relations and influence outcomes. The result is the embedded sales force as an assemblage is constantly disrupted and

destabilized by the competing and conflicting territorializing processes of brands and stores. While these territorializing processes promote cooperation within the respective assemblage (for example, enhancing loyalty to the store or to a particular cosmetics brand) they promote competition against other assemblages, and particularly strain the goal of cooperative relations between the store and brand. That is, these territorializing processes may undermine the most important goal of serving the customers' needs across cosmetics brands within the department store.

The problematic nature of this embedded sales forces is thus highlighted by examining patterns of coupling and decoupling that trace the shifting and conflicted alliances of sales people with the store and brands in combination with identifying the territorializing processes of stores and brands. Cooperation within the brand and department store assemblages that is supported through these territorializing processes actually creates competition rather than cooperation at the boundaries. As described earlier, for sales people to cooperate across cosmetics counters within the store they have to act at odds with the incentives, material and other structures set up by brands and stores.

While examining the cosmetics section of a department store serves to highlight the significant issues faced by embedded sales forces, the situation is far from unique to this context. While, it might well be that "being at the center of not just one organization but many," that is "polycentric" improves coordination (Bradford et al. 2010), this would seem to depend on the capacities and territorializing processing of the associated assemblages. Specifically, Bradford et al. 2010 posit the need to better understand how to support the activities of embedded sales forces and the unique aspects of managing

embedded sales forces. This research, framed through the lenses of actor-network and assemblage theory can help answer that question.

Specifically, a high level of coupling and decoupling is likely to be an important characteristic of embedded sales forces. Of necessity, embedded sales people must move among and between the buyer organization, marketing and other functional areas in their firm and in and out of relations with other sales team members (Bradford et al. 2010). Moreover, this coupling and decoupling with various assemblages is inherently disruptive and destabilizing, despite the positive role it may have in providing innovative offerings through incorporating diverse perspectives. While having salespeople with a relationship orientation (Bradford et al 2008; Brewer and Chen 2007) is useful, this may only serve to make the territorialization processes of respective assemblages (brands and stores) a more powerful draw. Hence, our work suggests that specific territorialization processes at the embedded sales force level are needed to help stabilize and provide identity for these relationship managers. In this regard, research on what makes an assemblage strong might be used to strengthen the material and expressive capacity of the embedded sales force. For example, performing relations and embodying a set of relations in durable materials can help create a sense of “we” and community (Law 1992; Latour 2005). In our context, regular material expressions of relations among cosmetics representatives for different brands within the department store could help build a sense of relatedness and reciprocity. Similarly, increasing the density of ties among cosmetics representatives for different brands could help contribute to assemblage identity and stability that could better withstand the power of the stores and brands (Delanda 2006; Sellar 2009). Ultimately, both stores and brands should be made more cognizant of the potential

dysfunctional consequences of their competing and often conflicting territorialization processes. The store as the platform for these different brands to come together could act to orchestrate both material and affective relations across brands. For example, I learned that shared counters can create a sense of shared purpose and reciprocity among representatives of different cosmetics brands. I also learned that the decoupling of a representative from one cosmetic brand to another within the same cosmetics assemblage of the department store can help to diffuse brand loyalties and increase the density of personal ties within the embedded sales force assemblage.

CONCLUSION

I demonstrate that cosmetics salespeople in department stores are embedded in multiple different assemblages. Out of the necessity, they constantly decouple and couple with other entities and assemblages, both over a longer time span and on a day-to-day basis. This has a potential to change their loyalties and associations in favor of one assemblage over the other. In addition, the potential material and/or expressive capacities possessed by the embedded sales people affects how they deal with the destabilizing and disruptive character of their embedded role and the often conflicting territorializing processes of the brands and stores.

Territorializing processes of the brand aims to foster employee loyalty and affiliation with the brand while the territorializing processes by the store aim to foster employee loyalty and affiliation towards the store. Embedded sales people are constantly pulled back and forth and their loyalties and associations constantly shift as a result. The

incompatible territorializing processes of stores and brands create confusion and frustration among them, forcing them to choose one over the other and might lead to a situation of commensalism (Mars et al 2012), where just one of the two partnering organization benefits while the other suffers

This has implications for cosmetic brands and department stores. Cosmetic brands need to understand the effects and consequences of being nested within a department store. Even with strong territorializing processes it might employ to forge a bond with and among all its sales representatives, the success of these processes is influenced by the capacities of the other actors and assemblages at different levels in this network, and especially the territorializing practices of department stores. While brands aim to prepare sales representatives to effectively compete against other brands, the store is motivated to encourage loyalty to the store and cooperation among brands. To date, cooperation among representatives of different cosmetics brands is still nascent and the material capacity of superior brand commissions has interrupted store assemblage power in this section of the store, much to the denial and dismay of the store managers. Nonetheless to leverage the true relationship power of an embedded sales force it might be desirable for cosmetics brands to completely rethink their department store strategy (especially since they are also aggressively pursuing stand-alone brand stores such as the new Mac stores). As I noted, the customer has relatively little capacity and agency within the cosmetics space and is essentially jostled from counter to counter or pounced on as a possible sale. By actively encouraging cross-brand training and selling (e.g. supporting cooperation across brand assemblages within the store) brands might help create customer value in

the form of customized service and unique understanding of each brand's unique value proposition.

The stores should take into account the existence of multiple assemblages within the store assemblage and especially the powerful brand assemblages within the cosmetics space. In addition, the store can find ways to strengthen the capacity of the cosmetics assemblage as a unified and prestigious community within the department store. This would mean specifically engaging the counter managers in collective material practices that enhance the identity of the overall assemblage. This would in turn weaken brand assemblage power and dysfunctional competition that actually hurts customer outcomes. By understanding and working with the social norms that operate in the cosmetics assemblage, rather than ignoring or interrupting them, the department store could not only strengthen the cosmetics assemblage but align it more closely with the store.

Both brands and stores need to understand the interplay of cooperative motives of embedded sales force as a result of their potential individual capacities, assemblage capacities, and territorializing processes of stores and brands, in order to better design policies regarding training, goals, compensation and other practices. The brand and store realizing their connectedness should implement policies and practices for the benefit of the embedded sales force, regarding them as a separate entity and assemblage, as this would benefit both the store and the cosmetic brand.

Finally, my findings have implications for understanding the dynamics of cooperation and competition and for understanding and managing embedded sales forces. Using an assemblage theory lens, the findings suggest that competition happens at the boundaries between assemblages and is exacerbated by territorializing processes that

accentuate boundaries between “us” and “them”. At the same time these territorializing processes contribute in positive ways to stabilizing and unifying heterogeneous actors within an assemblage, strengthening internal loyalty, shared values and cooperative practices. That is, cooperation happens within assemblages. Thus, the true challenge of the embedded sales force is the constant interplay of territorializing practices by the multiple organizations they are in partnership with. Creating and reinforcing material and expressive capacity for the embedded sales force as a unique organizational entity should be instrumental to their ability to cooperate rather than simply couple and decouple across the assemblage boundaries of the multiple organizations they are embedded within.

CHAPTER 3: ESSAY 2 - ACQUIRING THE GENIUS INVENTOR

“We know more than we can tell.” – Polanyi, 1966, p. 4

Innovation is a key contributor to the long term success of organizations (Pauwels et al 2004; Drucker 1973). Innovation is an important source of sustainable competitive advantage for an organization (Drucker 1973; Chen et al 2009), especially, when it has to compete in environments where change is pervasive, unpredictable, and continuous (Brown & Eisenhardt 1997). Hence, firms need to constantly innovate. While it is true that in some cases innovation can come from within an organization (Damanpour 1991; McAdam 2000; Sivadas & Dwyer 2000; DeLuca & Atuahene-Gima 2007), there is general agreement in the innovation literature that outside sources of knowledge are often critical to the innovation process (Cohen & Levinthal 1990). This is supported by extensive research on the various external sources of innovation (von Hippel 1994; Sivadas & Dwyer 2000; Hauser, Tellis, & Griffin 2006; Chen et al 2009; Ahuja & Katila 2001). In this research, I focus on acquisitions, a mode of external partnering, and the role it plays in the innovation output of the acquiring firm. Prior research on the effect of acquisitions on innovation is mixed. Hence, I focus on identifying factors that lead to successful innovation outcomes from the acquisition.

Over the years, there has been a tremendous increase in acquisition by firms. M&As rose by 2% in 2012 over the previous year, totaling up to \$2.6 trillion US dollars (HITC Business). Even with this increase in acquisition activity, scholars are mixed in their opinions about its effect on innovation. Research on the effect of acquisition on innovation can broadly be categorized into two major streams, each with a different

focus. One of the streams that emerge from the corporate control tradition that focuses on the decision makers and their roles in an organization's growth and trajectory, suggests that acquisitions hurt innovative output of the acquiring firms (Prabhu, Chandy, and Ellis 2005). This research identifies lack of integration between the acquiring and target firms as the cause for dismal innovation performance of the acquiring firm subsequent to the acquisition (Shrivastava 2007; Haspeslagh and Jemison 1987). Another stream of literature, with a focus on processes, examines the various types of "fit" (Ahuja and Katila 2001) and absorptive potential (Cohen and Levinthal 1990; Fosfuri and Tribo 2008; Prabhu et al 2005) of the acquiring and target organizations suggests that, if and when there is good integration between the acquiring and target firms, it leads to beneficial innovation outcomes for the acquiring firm (Zollo and Singh 2004; Shrivastava 2007; Buono and Bowditch 1989; Pablo 1994; Shrivastava 1986; Yunker 1983). Both these streams of research highlight the importance of integration between target and acquiring firms. But what is integration?

Literature on acquisitions has examined different facets of integration, like technology integration (James, Georghiou and Metcalfe 1998), knowledge integration (DerLuca & Atuahene-Gima 2007; Ahuja and Katila 2001), structural integration (Puranam and Shrikanth 2007), and social integration (Zahra and George 2002) as a precursor to success and smooth functioning of the acquiring firm post acquisition. But common to all this research is the acknowledgment that the success of these integration efforts rest on the skills of individuals that structure their interactions both within and outside their firms (James et al. 1998; Zahra and George 2002; Puranam and Shrikanth 2007). Especially in an industry like Biotechnology, acquisitions for the purpose of

furthering and increasing innovation outputs are a common phenomenon. For such acquisitions, successful outcomes materialize only when human capital in general and inventors in particular, from both the acquiring and target firms are integrated effectively (Winter 1987). Inventor integration in acquisitions in Biotech is vital as Biotechnology as an industry is knowledge intensive (Audretsch and Stephan 1996; Powell et al 1996) and fast paced. Knowledge that is necessary in generating further innovations is tacit (Fuchs and Krauss 2003) and primarily resident in individual and group processes (Kogut and Zander 1992; 1996; Tsai 2001), or more specifically in the inventor and her relations. Innovation denotes intricate knowledge management processes of identifying and utilizing ideas, tools, and opportunities to create new or enhanced products or services (Subramaniam & Youndt 2005). Innovation requires the convergence of many sources of knowledge and skills, usually linked in the form of a network (Salman & Saives 2005). In such cases, the success of an innovation crucially depends upon whether the inventors that embody the sources of knowledge and skills, stay and continue to be productive in the acquiring firm (Ernst and Vitt 2000; Granstrand and Sjolander 1990) after the acquisition. While there is some evidence that suggests inventors leave the acquiring firm after an acquisition (Ernst and Vitt 2000; Granstrand and Sjolander 1990) resulting in failure of the acquisition, this has not deterred organizations in biotech from making acquisitions with an objective to acquire the inventors with all their tacit knowledge, skills and experiences (Ranft and Lord 2002; Miller 1991). This raises the question — are there factors that can determine and influence successful integration among inventors of the target and acquiring firms? And if and when successful inventor integration occurs, does it have any effect on the innovation outcomes of the acquiring firm? These are some

of the questions I explore and answer in this research. I examine patents as a measure of innovation. Patents by definition represent a unique and novel element of knowledge. It represents a collection of discrete, distinct units of knowledge (Ahuja & Katila 2001). Patents correlate well with other measures of innovative output like new products (Puranam et al 2006), and innovation and invention counts (Achilladelis et al 1987).

I make several important contributions with this research. First, in line with other research, I examine innovation outcomes of the acquiring firm, four years after an acquisition (Sampson 2007; Ahuja and Katila 2001). This controls for some of the industry and period effects commonly cited as a problem with prior acquisitions research (Fowler and Schmidt 1989). In addition, I break down the innovation outcomes into three different components, namely, total innovation output, breadth of innovation, and depth of innovation. This extends the research on innovation and post M&A integration activities of the firm. In addition, although implicit, this research also extends March's (1991) seminal work on exploration and exploitation, by identifying depth of innovative outcomes by the acquiring firm as an indicator of exploitation, and breadth of innovative outcomes by the acquiring firm as an indicator of exploration. Second, I identify relational capacities of target and acquiring firm inventors two years before acquisition, and explore how this determines actual inventor integration at the time of acquisition. This has tremendous managerial implications. Managers are often entrusted with the complex task of estimating the success and value of an acquisition. This research provides a valuable tool for managers to assess if the acquisition will lead to successful innovation by examining the prior network characteristics in the form of relational capacities of individual inventors from target and acquiring firms.

CONCEPTUAL BACKGROUND

Inventor Integration and Outcomes

An acquisition is motivated primarily by the desire of an acquiring firm to obtain valuable resources from the target firm. Acquiring firms can use acquisition as a tool to acquire several different kinds of resources, like technology (Winter 1987; Ahuja and Katila 2001; Chaudhuri and Tabrizi 1999; Puranam and Shrikanth 2007), information systems, processes and capabilities, and human capital (Ranft and Lord 2002). These resources can be broadly categorized into two different kinds - knowledge assets and knowledge producing assets. Knowledge assets that an acquiring firm inherits from the target firm represents current technology in the form of information systems, existing structures, and intellectual property possessed by the target firm. In contrast, knowledge producing assets represent not just current assets, but assets like human capital and their relational networks that embody the processes and mechanisms that are capable of generating further innovations (Ahuja and Katila 2001; Chaudhuri and Tabrizi 1999; Powell, Koput, and Smith-Doerr 1996).

The acquiring firm needs to integrate both the knowledge assets (Gates and Very 2003; Carlile 2002) and knowledge producing assets (Chaudhuri and Tabrizi 1999; Puranam, Shrikanth, and Zollo 2006; Ranft and Lord 2002) from the target firm, in order to benefit from the acquisition. Integrating knowledge assets confers efficiency in operations, and integrating the knowledge producing assets ensures future growth, success and productivity. Integration has been identified as one of the critical elements

that dictates the success or failure of an acquisition (Gates and Very 2003; Carlile 2002, Puranam and Shrikanth 2007; Chaudhuri and Tabrizi 1999; Puranam, Shrikanth, and Zollo 2006; Ranft and Lord 2002). Literature from corporate control tradition that points to a negative effect of acquisition on innovative activity of the acquiring firm identifies lack of integration between the acquiring and target firms as the key reason for failure of acquisitions (Chaudhuri and Tabrizi 1999; Hagedoorn and Duysters 2002; Steensma and Corley 2002). Other research from strategic management, finance, accounting, and HRM show mixed results of the effect of acquisitions on innovative activity of the acquiring firm (Chakrabarti, Hauschildt, and Suverkrup 1994; Ranft 1997). But these different streams of research, unanimously agree that integration between the two firms is vital for success of the acquisition. But what is integration in the event of an acquisition? There are several ways in which integration has been conceptualized and examined in the literature (Gates and Very 2003; Larsson and Finkelstein 1999), but at the crux of it, integration at the organizational level represents the ability of two entities to come together and collaborate.

Inventor integration is a situation where two parties or inventors in this case, engage in direct interactions or collaborations with each other (Larson 1992). Interaction among inventors of target and acquiring firms have several beneficial consequences, like building mutual understanding and good relations (Bohmelt 2009), improved trust and willingness to share knowledge (Tsai and Ghoshal 1998; Levin and Cross 2004), and actual transfer of knowledge that is complex, tacit, and not easily codifiable (Ghoshal et al 1994; Uzzi 1996; Almeida and Kogut 1999; Rosenkopf and Almeida 2003). Inventor integration, in effect, helps mobilize target firm inventors into the acquiring firm. The

beneficial outcomes that are a consequence of inventor integration are necessary ingredients for successful innovation in any firm, more so with respect to acquisitions. What are the different kinds of innovations outcomes that arise as a result of inventor integration? The first type of innovation outcome is the total number of innovations generated by the acquiring firm. The more the integration among the inventors of the target and the acquiring firm, the better the trust, willingness to help, work together, and share knowledge.

Innovation outcomes can be measured in terms of inputs like R&D expenditure or in terms of outputs like patenting frequency (Pakes & Griliches 1984; Henderson and Cockburn 1986). While acquisitions can affect both inputs and outputs (Hitt et al 1991), my focus in this research is primarily on innovative output, in the form of patenting frequency. That is, the total number of patents generated by the acquiring firm subsequent to the acquisition. Prior research has used patenting frequency (Ahuja and Katila 2001; Hitt et al 1991; Ahuja 2000) as a measure of innovation. Patents, as a measure of innovative output, correlate well with other measures of innovative output, such as new products (Comanor and Scherer 1969), innovation and invention counts (Achilladelis, Schwarzkopf, and Cines 1987), and sales growth. Therefore, I hypothesize that inventor integration between target and acquiring firms at the time of acquisition, is positively related to number of innovations generated by the acquiring firm or patenting frequency of the acquiring firm four years from the time of acquisition.

H1: Inventor integration at the time of acquisition has a positive effect on total innovation generated by the acquiring firm subsequently, all else equal.

Research suggests that, organizations, in order to be successful, and even survive, needs to follow the dual and parallel objectives of exploration and exploitation (March 1991; Tushman and O'Reilly 1996). The essence of exploitation is refinement and extension of existing organizational competencies (March 1991). Exploitation hones and extends the current knowledge and brings about greater efficiency and improvements (Atuahene-Gima 2005). Depth of innovations, defined as the number of innovations produced by a firm within its own field, is an indicator of exploitation activities of the firm. Depth of innovations confers several potential benefits for the firms. It can aid firms from being locked out of developing or assimilating new knowledge (Zahra and George 2002), enable them to pioneer new knowledge in those fields, gain competencies in core product areas, and thus innovate (Bierly and Chakrabarti 1996; Hamel and Prahalad 1994). While literature enumerates all these benefits of exploitation and depths of knowledge and innovation, how can an organization learn to exploit and build depth? New knowledge and innovation does not arise in vacuum, rather, it is a path-dependent outcome of building on prior knowledge (Prabhu, Chandy, and Ellis 2005). And knowledge is interpreted information that is anchored in people's beliefs and commitments (Huber 1991). It comprises of cognitive elements such as beliefs, understanding, and integration with previous knowledge (Marinova 2004). Therefore, integrating inventors of target and acquiring firms is an important way in which an acquiring firm can learn to exploit the knowledge in its field, and build depth. With the inventor integration, the valuable knowledge based resources residing in the inventor's cognitive beliefs and schema's, and social capital is transmitted to the acquiring

organization. Hence, I expect that inventor integration has an influence on depth of innovations. I, therefore, hypothesize that:

H2: Inventor integration at the time of acquisition has a positive effect on depth of innovation generated by the acquiring firm subsequently, all else equal.

Additionally, while exploitation and building depth are important for firms to acquire new knowledge, and to gain competency; firms also need to balance exploitation activities with exploration (March 1991; Tushman and O'Reilly 1996). The essence of exploration is experimentation (March 1991). Exploration entails development of new knowledge, experimenting to foster variation and novelty (Atuahene-Gima 2005). It is basically about having a broader base of knowledge and experimenting with different combinations and configurations of resources. Breadth of knowledge, defined as the range of fields over which the firm has knowledge, is considered helpful in innovation (Beirly and Chakrabarti 1996; Cohen and Levinthal 1990; Henderson 1994; Henderson and Cockburn 1994). It leads to the ability to integrate knowledge from different fields in a more complex and creative manner (Bierly and Chakrabarti 1996; Kogut and Zander 1992), and prevents firms from being locked-out in emerging domains because of core-rigidities (Leonard-Barton 1995). Like for depth of innovations, inventor integration appears to be one of the key drivers for breadth of innovations. When inventors from target and acquiring organizations, with their unique skills and expertise, integrate and collaborate with each other, that leads to several possibilities and ways for recombining and reconfiguring ideas and knowledge (Kogut and Zander 1992, 1996). This

recombinatory potential is important for breadth of innovations. Therefore, I expect a positive relationship of inventor integration on breadth of innovation by the acquiring firm.

H3: Inventor integration at the time of acquisition has a positive effect on breadth of innovation generated by the acquiring firm subsequently, all else equal.

Inventor Integration and its Antecedents

While there is strong consensus that integration is important for success of an acquisition, what factors drive integration between the acquiring and target firms? That is, what factors determine if and whether the two organizations that are party to an acquisition, namely, the target and acquiring firm, will be able to come together and collaborate in a productive way? While the benefits of inventor integration are evident, ironically, there is also strong evidence that suggests that inventors react unfavorably to acquisitions, both individually and collectively (Larsson & Finkelstein 1999; Schweiger and Walsh 1990). At the individual level, an inventor experiences the “we versus they” antagonism, condescending attitudes, distrust, tension, and hostility (Astrachan 1990; Blake and Mouton 1985), and faces a threat of relocation and potential loss of individual influence (Greenwood & Hinings 1996). At the collective level, there might be cultural clashes between the two organizations (Chatterjee et al 1992), which might make the day-to-day working difficult. The consequence of both individual and collective levels of resistance, in general, causes the inventor to quit the acquiring firm or become unproductive subsequent to an acquisition (Ernst and Vitt 2000; Ziedonis 2004, Zenger 1994; Granstrand and Sjolander 1990). Are there factors that can determine and predict

integration among inventors of target and acquiring firms at the time of acquisition?

While research has demonstrated the importance of inventor integration, what are some of the antecedents that can predict inventor integration? Some recent research and social network theory adopts a relational perspective and suggests that the key to understanding integration is in the relational capabilities of organizations (Lorenzoni and Lipparini 1999; Capaldo 2007; Dyer and Singh 1998; Newell et al 2008; Swan et al 2007; Powell, Koput, and Smith-Doerr 1996) in such a setting. Relational capability is defined as the ability of a firm to interact with other firms (Lorenzoni and Lipparini 1999), and effectively manage their inter firm relationships (Day 1994, 2000; Dyer and Singh 1998; Jap 1999, 2001; Johnson 1999; Srivastava, Shervani, and Fahey 1998). It is regarded as a distinct organizational capability that helps firms sustain its innovativeness by creating and managing the overall architecture of its network over time (Capaldo 2007).

Relational capability, in general, has been linked to several beneficial outcomes for organizations, like increased knowledge access and transfer of knowledge (Lorenzini and Lipparini 1999; Capaldo 2007), and competitive advantage (Capaldo 2007). While relational capability is predominantly defined and conceptualized at the organizational level, several research supports the crucial role of individual human capital and their relational networks in building firm level capabilities (Cohen and Levinthal 1990; Rothaermel and Hess 2007). That is, it supports the argument that individual level variables, like an inventors' level of knowledge and social networks are heterogeneous in nature and that it has differing levels of influence on firm level variables. In this research, since my objective is to examine the innovative outcomes of the acquiring firm, I restrict our focus on the role of inventors and their relational networks in building firm level

relational capabilities. That is, I specifically explore the role of inventor relational capacities and its effect on firm level integration, which in turn determines innovation outcomes. I define relational capacities of inventors as their potential to form new relationships with other inventors. Social network theory offers several concepts like density (Marsden 1990), indirect ties (Bohmelt 2009), and bridging ties (Zaheer and McEvily 1999) to understand the relationship potentials of actors in a setting. In this paper, I examine one such concept - indirect ties, as an indicator of an actor's (inventor's) relational capacity. An actor A, who is connected to actor C through a common tie B, is said to have an indirect tie or a one-degree connection to C. This one-degree connection that A has with C indicates A's relational capacity. Indirect ties can extend to many levels, like one-degree, two-degrees and so on. In this research, while it is possible to look at several levels or degrees of connections and ties, I restrict my focus to one-degree connections or simple indirect ties only, similar to those illustrated in the above example. That is, I focus only on connections like the ones actor A has with actor C in our example.

In high technology industries like Biotechnology (Sikora 2000; Audretsch and Stephan 1996), where innovation and patenting are important, the ability to integrate is fundamentally driven by relational capacities of inventors. Prior research has examined several different kinds of human capital integration - integration of regular employees (Astrachan 1990; Blake and Mouton 1985; Greenwood et al 1994), integration of managers and top management teams etc. While I agree that all these different kinds of human capital integration are important, since our focus is on innovation, I only examine integration of inventors of target and acquiring firms, and identify the role of inventor

relational capacities on integration, in the event of an acquisition.

Both target and acquiring firm inventors possess relational capacities. That is, the target firm inventors possess several zero-degree connections, from inventors that they collaborate or have collaborated with. From these direct relationships, there are several potential connections or one-degree connections that emerge. The existence of these one-degree connections is an indication of their relationship potential, in terms of how capable and willing they are to forge further relationships with others in the future. The more the potential relational capacity of the target firm inventors, the higher is their ability to form new relations with other inventors in the future, that is, the higher their ability to integrate with other inventors in the future. Therefore, I hypothesize that, the relational capacities of target firm inventors prior to an acquisition determines their integration with acquiring firm inventors at the time of acquisition.

H4: Relational capacities of target firm inventors before an acquisition has a positive relationship on integration among acquiring and target firm inventors at the time of acquisition.

While relational capacity of target firm inventors is an important factor that influences integration, the relational capacity of acquiring firm inventors are also equally important in facilitating integration among inventors of the two organizations. Therefore, I hypothesize that relational capacity of acquiring firm inventors prior to an acquisition is positively related to integration among target and acquiring firm inventors at the time of acquisition.

H5: Relational capacities of acquiring firm inventors before an acquisition has a positive relationship on integration among acquiring and target firm inventors at the time of acquisition.

In what follows, I first discuss the context of the research. Then, I explain the data collection methods, measures of the variables and analysis. Finally, I discuss the results, and discuss the implications of this study in the conclusion section.

METHODOLOGY

Research Context

I chose Biotechnology industry for this study. Innovation, and commercialization of innovation in the form of patents, is very important and emphasized in Biotech (Sikora 2000; Powell et al 1996). It is a very knowledge intensive industry (Powell et al 1996), where the knowledge that goes into innovation and patents are considered tacit (Fuchs and Krauss 2003), and highly interactive in nature (Fuchs and Krauss 2003; Liebeskind et al 1996). There is plenty of evidence of alliances and collaborations among firms in Biotech (Liebeskind et al 1996; Fornahl, Broekel, and Boschma 2011). While it is generally accepted that acquisitions are more conducive to transfer of tacit knowledge, it is surprising that not many studies in Biotech focus on acquisitions, but instead on alliances and collaborations. This paucity of research on acquisitions in Biotech is also puzzling, given the tremendous increase in acquisition activities within Biotech (Book - Edited by Faulkner, Teerikangas, and Joseph 2012). Therefore, in order to enhance our

understanding of the role of acquisitions in innovative output of the acquiring firm in a knowledge and innovation intensive industry, I chose Biotechnology industry for this research.

Sample Data Collection

I collected secondary data for this research from multiple sources. I used SDC platinum to get data on biotechnology acquisitions from 1983 to 2006. SDC platinum also lists the SIC codes of both the target and acquiring firms, along with information on City, State, and Nation of residence of the firms. Biotechnology is a very broad industry and consists of firms that are involved in a broad range of activities, ranging from pharmaceutical biotech, industrial biotech, agricultural biotech, food processing, to bioinformation and testing and analytical services. Since my objective in this research is to assess innovation output of the acquiring firm, I only chose four categories of firms from the above mentioned categories (Figure 5). I specifically chose firms that were engaged in activities pertaining to pharmaceutical biotech, industrial biotech, agricultural biotech, and food processing. Pharmaceutical biotech deals with therapeutics and diagnostics; industrial biotech deals with organic chemicals, mineral recovery, bioelectronics, energy production, and enzymes; agricultural biotech deals with biopesticides, genetically altered crops, plant disease diagnostics, veterinary disease diagnostics, therapeutics, and vaccines; and food processing biotech firms deal with organic chemicals, mineral recovery, bioelectronics, energy production, and enzymes. These are the categories where innovation and patenting is highly emphasized; hence, I focused on these 4 categories of firms. Following industry standards, and after reading

the description of business the target and acquiring firms are involved in, I filtered the SIC codes for each of the above mentioned categories. I then used these SIC codes to filter out the firms from the entire list of biotechnology acquisitions that I obtained from SDC Platinum. This helped me narrow down my focus on those acquiring and target firms that were involved in hard core biotechnology activities and not ancillary firms that were providing material or informational support for these firms.

I obtained firm level variables for these target and acquiring firms from WRDS by matching the firm names and CUSIP. Finally, I obtained patents for the target and acquiring firms in the list from CRIE (<http://crie.patent-rank.com/crie/patent-data/>), a patent repository housed in University of Arizona. Since a firm could file for patents not just in the biotech space, but in any of the other categories, it was necessary to filter out and remove patents that were not relevant to biotechnology. Hence, I again further classified patents at this stage based on USPTO classes. USPTO defines biotechnology patents based on patent classes. If any patent filed by the firm belonged to a set of 17 patent class it was considered as a biotech patent. This is consistent with the procedure carried out by Lee (2010). I collected patent information for several consecutive years, ranging from 13 years before the acquisition to 13 years after acquisition for every firm on our list. Every patent applied and approved by the USPTO, lists the inventors that worked on the patents, any prior art that the patent draws from, location, and the firm name to which it was assigned along with other information. The location of firms, along with the firm names that I obtained from SDC platinum helped match the firms and avoid errors in the process of matching. So my final data set consisted of firms involved in acquisition in 4 categories of biotechnology firms (pharmaceutical, industrial,

agricultural, and food processing), and that had patents within the set 17 USPTO biotech patent classes (Table 8). After all the filters were applied, my final data consists of 95 unique M&A transactions in which both acquiring and target firms had patents.

MEASURES

Inventor Integration

Inventor integration refers to direct or zero-degree connections between acquiring and target firm inventors at the time of acquisition (t_0). I map all inventor relations in an adjacency matrix. An adjacency matrix is a binary matrix, where 0 represents lack of direct (zero-degree) ties between the two inventors and 1 represents the presence of direct (zero-degree) ties between the inventors.

Some of these direct connections or zero-degree ties that are seen at the time of acquisition could be connections that existed in the past. Since prior direct connections do not capture integration among inventors that happened as a result of the acquisition, I choose difference scores in order to overcome this issue. That is, I examine zero-degree connections among inventors of target and acquiring firms at t_0 and subtract from it, the zero-degree connections of target and acquiring firm inventors that existed at t_2 . This difference measure gives us the new zero-degree connections that emerged at the time of acquisition, and not zero-degree connections that were carried from the past.

Antecedents of Inventor Integration

Relational Capacities. Relational capacities of an inventor is measured as all the indirect one-degree ties that an inventor has. Both target and acquiring firm inventors possess relational capacities. Target firm inventor relational capacities are measured as the sum of all the one-degree connections of all the target firm biotechnology inventors. Acquiring firm inventor relational capacities are measured as the sum of all one-degree connections of all acquiring firm biotechnology inventors. In order to find the one-degree ties, I first create an adjacency matrix of inventor relations, I (Fig 2). An adjacency matrix lists all the direct connections, in the form of paths. That is, an adjacency matrix tells us what actors are adjacent, or have a direct path from one to the other (Hanneman & Riddle 2005). It tells us how many paths of length one are there from each actor to each other actor (Hanneman & Robert 2005). The diagonal in the adjacency matrix lists the ties of an inventor with herself, and hence is ignored. One-degree connections are only connections between those actors who do not already have a zero-degree connection. In order to get the one degree connections, I square the adjacency matrix. A squared adjacency matrix tells us how many pathways of length two are there from each actor to each other actor (Hanneman & Riddle 2005). A length of two path ways from one actor to another indicates that an actor can reach another actor through a common tie only. It takes two lengths or pathways to reach the other actor -- one to the common tie, and two to the other actor that is also connected to the common tie (Figure 7). In order to multiply any two matrices, the two matrices need to be conformable. But since an adjacency matrix is already a square matrix, it conforms to multiplication by itself. A squared adjacency matrix looks at all paths that are of length two, that is one-degree connections (in contrast to zero-degree connections which are of length one). Any non-zero value in

the squared adjacency matrix indicates the presence of one-degree ties between the inventors. A one-degree tie represents a relational potential or capacity of target and acquiring firm inventors. It is measure at t_{-2} , that is, two years prior to an acquisition.

Innovation outcomes

Number of innovations. Number of innovations by the acquiring firm post acquisition, is measured as the number of patents generated by the acquiring firm 4 years subsequent to acquisition. Patent count has been used in prior research (Lee 2010; Puranam et al 2006; Hitt et al 1991, Ahuja and Katila 2001) to capture the innovative output of a firm. Also, a 4-year window is agreed to capture the effects of acquisition on innovation in its entirety (Sampson 2007; Ahuja and Katila 2007). Since the acquiring firm might have continued to see an increase in innovation output even without the acquisition, in order to assess the value that the acquisition brings in terms of innovation, I use difference scores. So I measure number of innovation as the number of patents filed by the acquiring firm 4 years subsequent to acquisition, and subtract from it the number of patents filed by the acquiring firm at the time of acquisition. This would provide a count of the actual number of new innovations generated by the acquiring firm in the form of patents.

Breadth of innovations. A broader range of knowledge and innovations helps firms to be less likely locked out because of core- rigidities (Leonard- Barton 1995), and gives the firm greater flexibility and adaptability to respond to environmental changes (Volberda 1996). Therefore, breadth of innovations is an important outcome of inventor integration. I measure breadth of innovation as the number of different patent subclasses within

which the acquiring firm patents. Again, a firm might be patenting in a broad range of patent classes even before and during the time of acquisition. Therefore, in order to examine the change in breadth of innovations as a result of acquisition, I use difference scores. In line with prior research, I measure breadth of innovations as, number of patent subclasses in which the acquiring firm files patents application 4 years subsequent to acquisition, and subtract from it, the number of patent subclasses in which the acquiring firm was patenting at the time of acquisition.

Depth of innovations. There is strong evidence in the literature that inadequate depth can result in firms being locked out of developing or assimilating new knowledge in that area (Zahra and George 2002). Depth of innovations help firms gain competency in core product areas (Bierly and Chakrabarti 1996; Hamel and Prahalad 1994). Hence, depth of innovations from inventor integration is an important outcome for acquiring firms. Here too, noting that an acquiring firm might have been patenting intensely under certain subclasses even before or during acquisition, in order to assess the real change in depth of patenting and innovation, I use difference scores. I measure depth of innovations as the number of patents filed under each subclass, 4 years subsequent to innovation, and subtract the number of patents filed under each subclass by the acquiring firm at the time of acquisition.

Control Variables

Size of the acquiring firm. Size of the acquiring firm has the potential to influence the innovation outcomes. Hence, I control for size of the acquiring firm. I measure size using the number of employees at the acquiring firm two years prior to the acquisition.

R&D expenses of the acquiring firm. Any investments made by the acquiring firm in R&D will result in increased productivity in the form of higher innovation output. Hence, I control for R&D expenses of the acquiring firm two years prior to the acquisition.

Analysis

I analyzed the conceptual model (Figure 4) using Path Analysis. A path analysis can evaluate the overall structural model and assess the contribution of any path or combination thereof. It helps capture the “causal and temporal paths” between the predictors and the criterion variables. In my conceptual model, I have two exogenous manifest variables — Relational capacities of target firm inventors at t_{-2} , and relational capacities of acquiring firm inventors at t_{-2} . In addition, I have four endogenous variables — inventor integration (measured at t_0), which leads to three innovation related outcomes, namely total number of innovation, breadth of innovation, and depth of innovation all measured at t_4 . In SEM, the exogenous variables are allowed to covary,

and ϕ indicates the covariance between the two exogenous variables (Table 10). The endogenous variables contain structural error (ζ) that can covary among the endogenous variables, as they might share a common variance not explained by the model, but not with the exogenous variable. The SEM lists the regression weights between the exogenous variable and the endogenous variable (γ), and the regression weights between the endogenous variables (β).

Size of the acquiring firm and R&D investments by the acquiring firm could have an influence on inventor integration at the time of acquisition, I controlled for these two variables in my model. Size of the acquiring firm has a direct relationship on the overall number of patents or total innovation generated by the acquiring firm. Size does not affect any of the other outcomes or inventor integration. R&D expenses have no significant effect on any of the outcome variables or inventor integration.

In path analysis, it is important to assess the fit of the overall model. In order for the model to be a good fit several indices like chi-square and RMSEA are commonly looked at. The chi-square, in this case was significant for the conceptual model, indicating that the model might not represent a good fit. The RMSEA ($p= 0.004$) which is below 0.05 indicates that the model is a good fit.

The results of the model (Table 9 and Figure 6) indicate that relational ties of acquiring firm inventors two years before the acquisition does not have a significant effect on inventor integration at the time of acquisition ($\beta= 0.000$, $p\text{-value}=0.226$). Therefore, H5 is not supported. Hypothesis 4 suggests that relational capacities of target firm inventors two years before the acquisition has a positive effect on inventor integration at the time of acquisition. This hypothesis is supported ($\beta =0.006$, $p\text{-}$

value<0.05).

Hypotheses 1, 2 and 3 investigate the relationship between inventor integration at the time of acquisition and innovation outcomes four years from acquisition. The innovation outcomes I study are: total number of innovation, breadth of innovation and depth of innovation. I find that inventor integration only has a significant relationship on depth of innovations generated by the acquiring firm. Hence, hypothesis 3 is supported ($\beta = 0.038$, p-value < 0.05), while hypothesis 1 ($\beta = 0.033$, p-value = .142) and hypothesis 2 ($\beta = -0.001$, p-value = 0.520) do not find support. While I hypothesized a positive relationship between inventor integration and breadth of innovation, I observe that inventor integration has a negative effect on breadth of innovations. While this is not a significant effect, the negative relationship between inventor integration and breadth of innovation offers some interesting insights. Literature advocates inventor integration as a way to explore and exploit new and existing competencies. I find that inventor integration leads to effective exploitation of core competencies but has no significant effect on exploration. An important finding that comes out of this analysis is that, inventor integration fully mediates the relationship between relational capacity of target firm inventors and depth of innovations generated by the acquiring firm. None of the direct effects, except for the effect of acquiring firm's size on total number of innovation generated by the acquiring firm, are significant. Hence, a firm that is interested in increasing its depth of innovation from acquisitions should focus on the relational capacities of target firm inventors to facilitate inventor integration, which then leads to depth of innovations from the acquiring firm.

The results of the path analysis (Table 11 and Figure 8) suggest an increase in

depth of innovations by the acquiring firm post acquisition. In order to test if the increase in depth of innovations of the acquiring firm is significant, I fit a latent growth curve model for the variable, depth of innovations. This gives a longitudinal perspective of the increase in depth of innovations of the acquiring firm, as a result of inventor integration. Latent growth curve models represent repeated measures of the DV, depth of innovations, as a function of time and other variables. The same acquiring firm is observed repeatedly over time. It looks at the relative standing of each acquiring firm modeled as a function of an underlying growth process. I specified the regression weights for each parameter in the model. The intercepts were assigned a regression weight of 1, and the slopes were assigned weights relative to the time for each measure (2,4,6 and 8). The results indicate that the mean intercept is 369.47 and the slope is 13.02, that is, every two years the number of patents within a subclass grows by an average of 13.02 patents. Both means and variances were statistically significant. Interestingly, there is a high degree of correlation between the intercept and the slopes ($r=0.4$) at the initial time of measurement which could be a related to changes over time.

CONCLUSION

This research highlights that inventor integration plays an important role in innovative output of the acquiring firm. It specifically increases the depth of innovations generated by the acquiring firm four years from the time of acquisition. Inventor integration helps the acquiring firm build and exploit its core competencies, as a way to further its innovation.

In addition, this research also plays an important role by highlighting the

antecedents for inventor integration. I identify relational capacities of inventors as a factor that facilitates integration among inventors of target and acquiring firms. While prior research on absorptive capacities and dynamic capabilities have indicated and differentiated the roles of potential and realized capacities, there is paucity of research that demonstrates the difference between the two. I contribute to that stream of literature and demonstrate that relational capacities of inventors, measured as one-degree ties, play an important role. Specifically, the relational capacities of the target firm inventors play a significant role in inventor integration. I find that the relational capacities of target firm inventors as early as 2 years before the actual acquisition determines their actual integration at the time of acquisition. The relational potential of the target firm inventors prior to an acquisition indicates their mobility and willingness to collaborate with inventors from the acquiring organization. This mobility and integration then facilitates knowledge transfer and learning (Lave and Wenger 1991) from the target firm inventors to the acquiring firm inventors. And this research hints at a possibility that it takes about two years for potential relationships to converge into actual relationships (Gulati 1995). While relational capacities of target firm inventors are vital for inventor integration, relational capacities of acquiring firm inventors do not contribute significantly towards inventor integration at the time of acquisition. This could be due to the fact that acquiring firm inventors, by virtue of belonging in the acquiring firm, come from a culture of stability where their day-to-day activities are neither threatened nor disrupted. Also, there is no fear of relocation or loss of reputation for the acquiring firm inventors. This could potentially explain the non-significant relationship between relational capacities of acquiring firm inventors two years before acquisition and inventor integration at the time

of acquisition.

One of the key limitations of this research is limited sample size. Limited size could also be the reason for insignificant relationships among other key variables specified in the model. But this research is meant as a mere empirical illustration of the role of relational capacities and inventor integration on innovation outcomes, in the case of acquisitions. While I controlled only for size, future research could control for an array of variables. It is however interesting to note that, despite the inherent noise in the data, the relationships elaborated above are significant. Additionally, this research also suffers from many of the same limitations of secondary research. We base our observations on patent data and inventor relationships that are mapped from the patent data. While integration of other actors, like employees, top management teams are equally important, we restrict our focus on inventor integration only. Integration of other types of actors involved in the setting and its effect on innovation is an important area for future research. Also, as an extension of this research, one could examine if inventor integration leads to other beneficial outcomes for the firms, like increase in profits.

This research offers important managerial contributions. In many cases, managers are entrusted with the task of estimating the value of an acquisition, and the success potential of an acquisition. An acquisition is also a context that is plagued by information asymmetry of many kinds. Under such circumstances, it becomes difficult for managers to objectively estimate the probability of success or failure of an acquisition. This research provides a tool for managers to assess the potential of success or failure of an acquisition, with respect to innovation outcomes. Managers could easily look up the publicly available patent data from the USPTO, and map the relational capacities of the

target firm inventors as a way to assess if integration and further collaboration is desirable, given their social network characteristics.

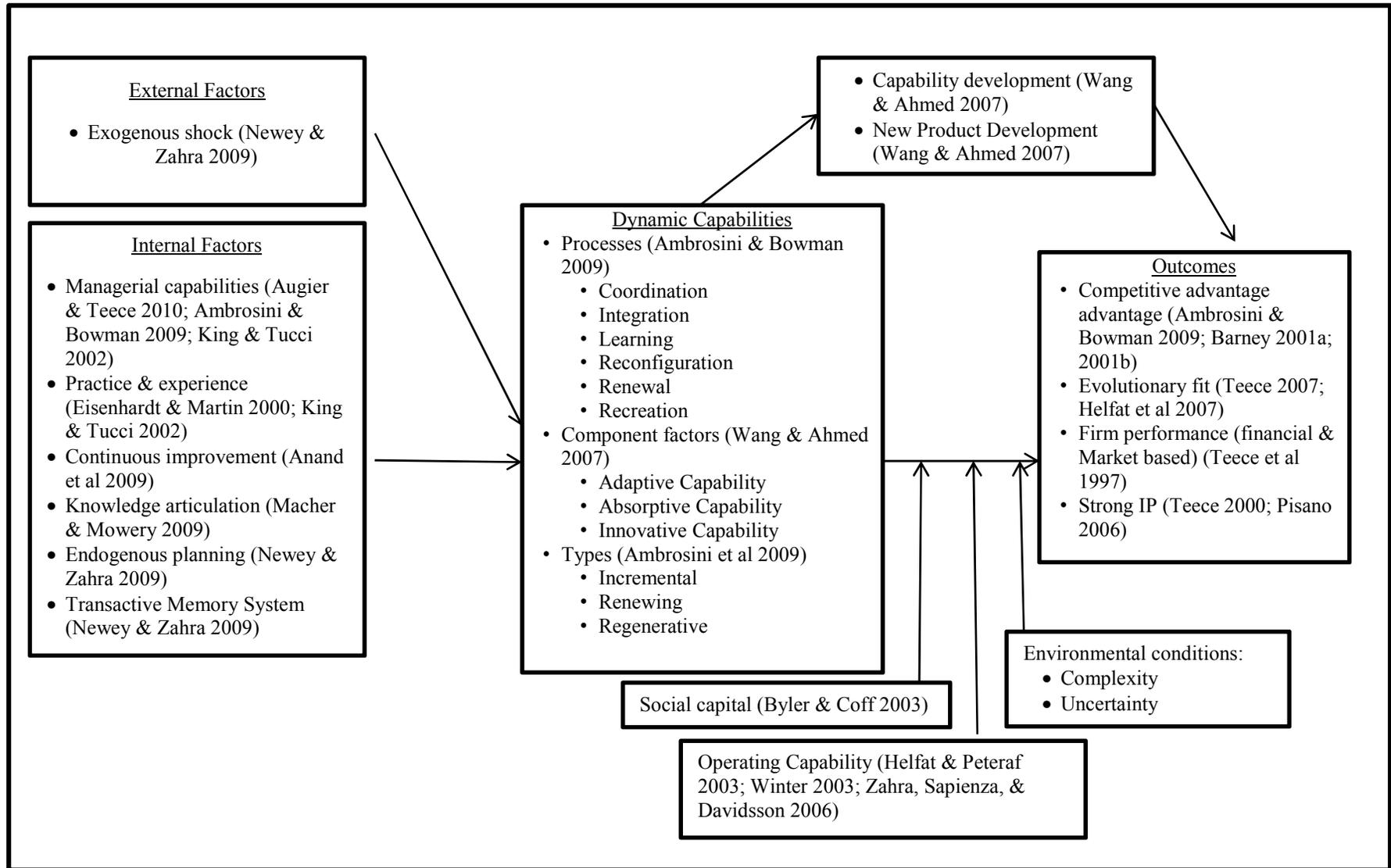
APPENDIX A: FIGURES

| | |
|--|----|
| <u>Chapter 1 - Figure 1: Dynamic Capabilities</u> | 85 |
| <u>Chapter 1 - Figure 2: Absorptive Capacity</u> | 86 |
| <u>Chapter 2 - Figure 3: Framework of Cooperation and Competition</u> | 87 |
| <u>Chapter 3 - Figure 4: Conceptual Model</u> | 88 |
| <u>Chapter 3 - Figure 5: Data Collection Process</u> | 89 |
| <u>Chapter 3 - Figure 6: Results of the Path Analysis</u> | 90 |
| <u>Chapter 3 - Figure 7: Demonstration of the process through which zero and one-degree ties were calculated</u> | 91 |
| <u>Chapter 3 - Figure 8: Latent Growth Curve Model</u> | 93 |

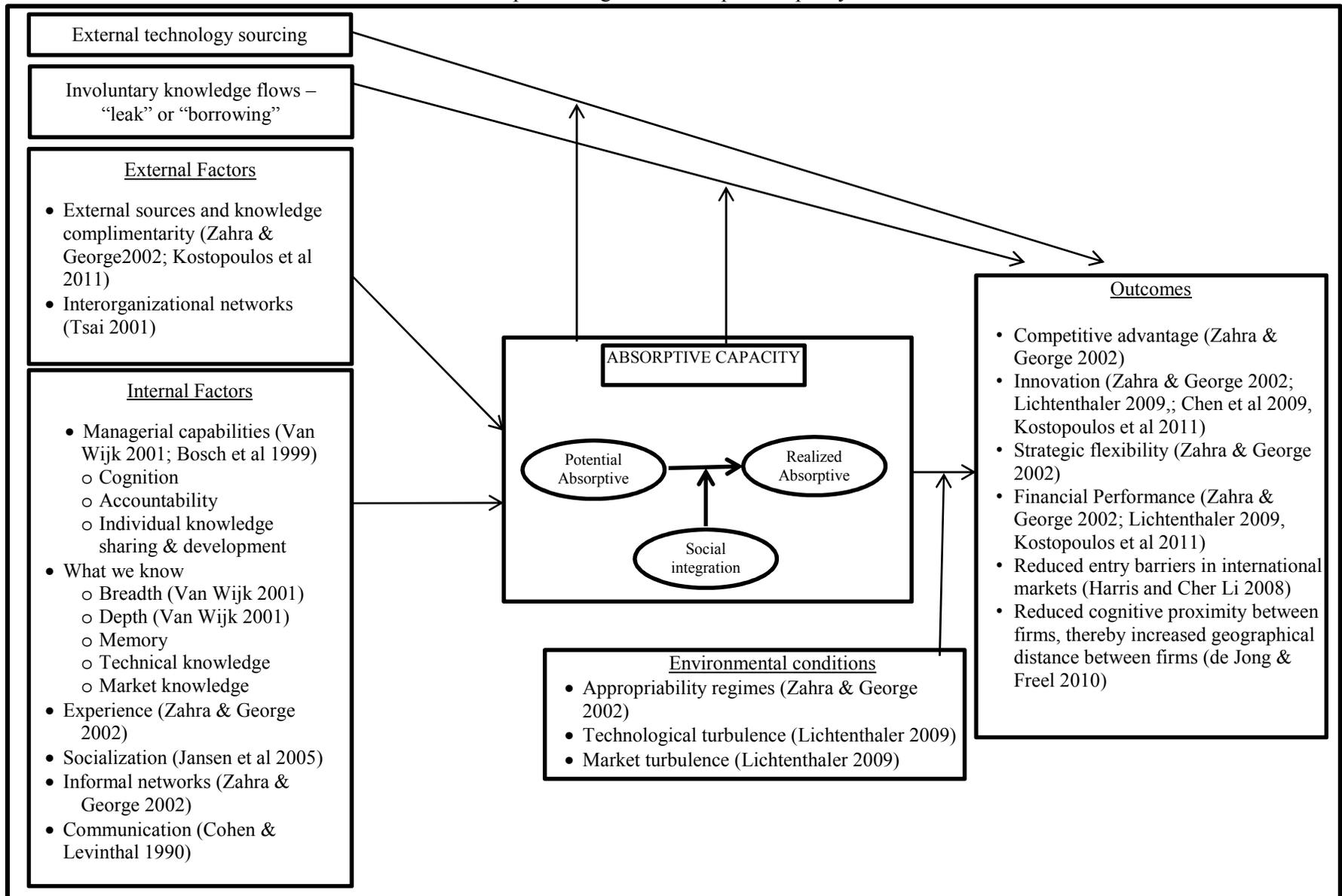
APPENDIX B: TABLES

| | |
|--|-----|
| Chapter 1 - Table 1: Definition of Capabilities | 94 |
| Chapter 1 - Table 2: Definitions of Dynamic Capabilities | 95 |
| Chapter 1 - Table 3: Definitions of variables associated with Dynamic Capabilities | 97 |
| Chapter 1 - Table 4: Definitions of Absorptive Capacity | 98 |
| Chapter 1 - Table 5: Definitions of variables associated with Absorptive Capacity | 99 |
| Chapter 2 - Table 6: Illustrative Actor- Assemblage Capacities | 100 |
| Chapter 2 - Table 7: Territorializing processes by different actors | 101 |
| Chapter 3 - Table 8 (17 patent classes) | 103 |
| Chapter 3 - Table 9: Results of Path Analysis | 104 |
| Chapter 3 - Table 10: Covariance of the independent variables | 105 |
| Chapter 3 - Table 11: Latent Growth Curve Model | 106 |

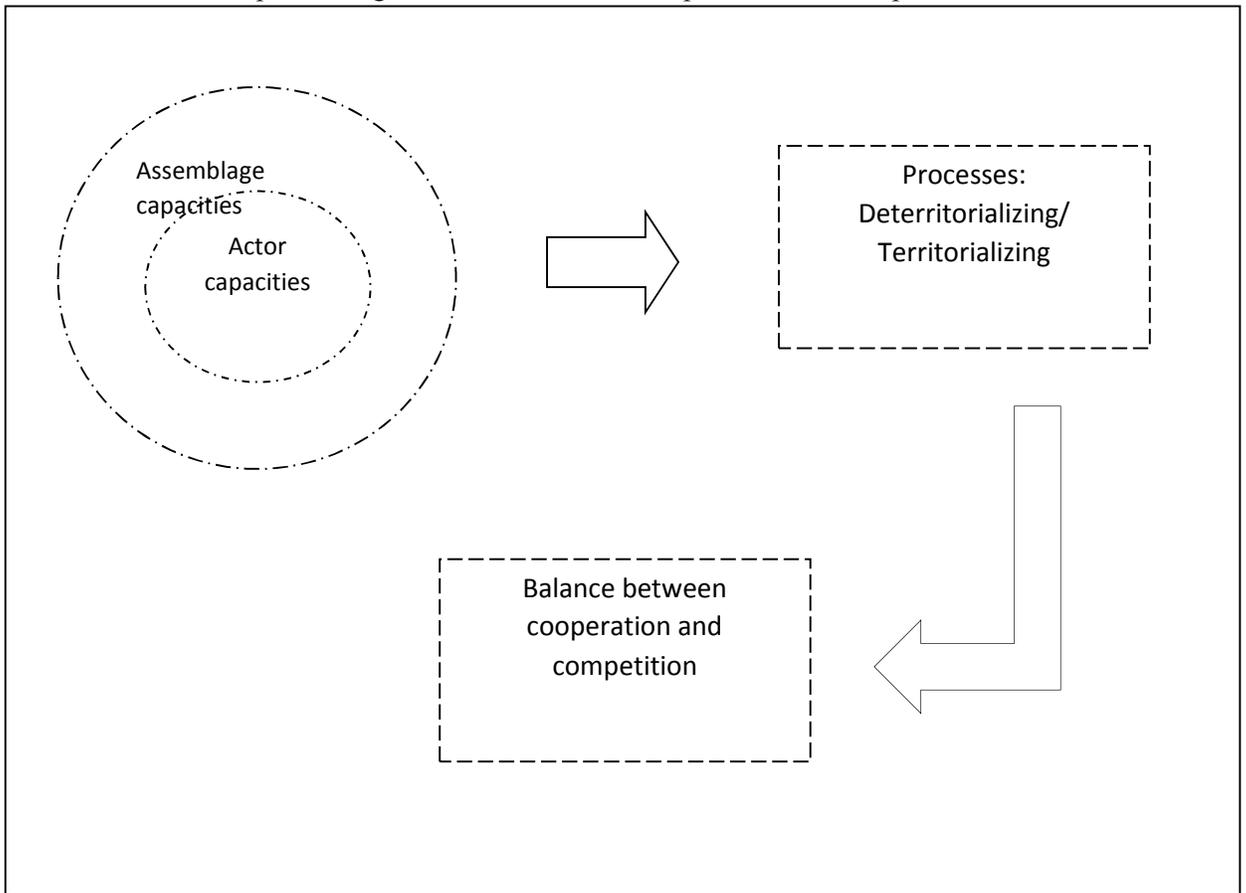
Chapter 1 - Figure 1: Dynamic Capabilities



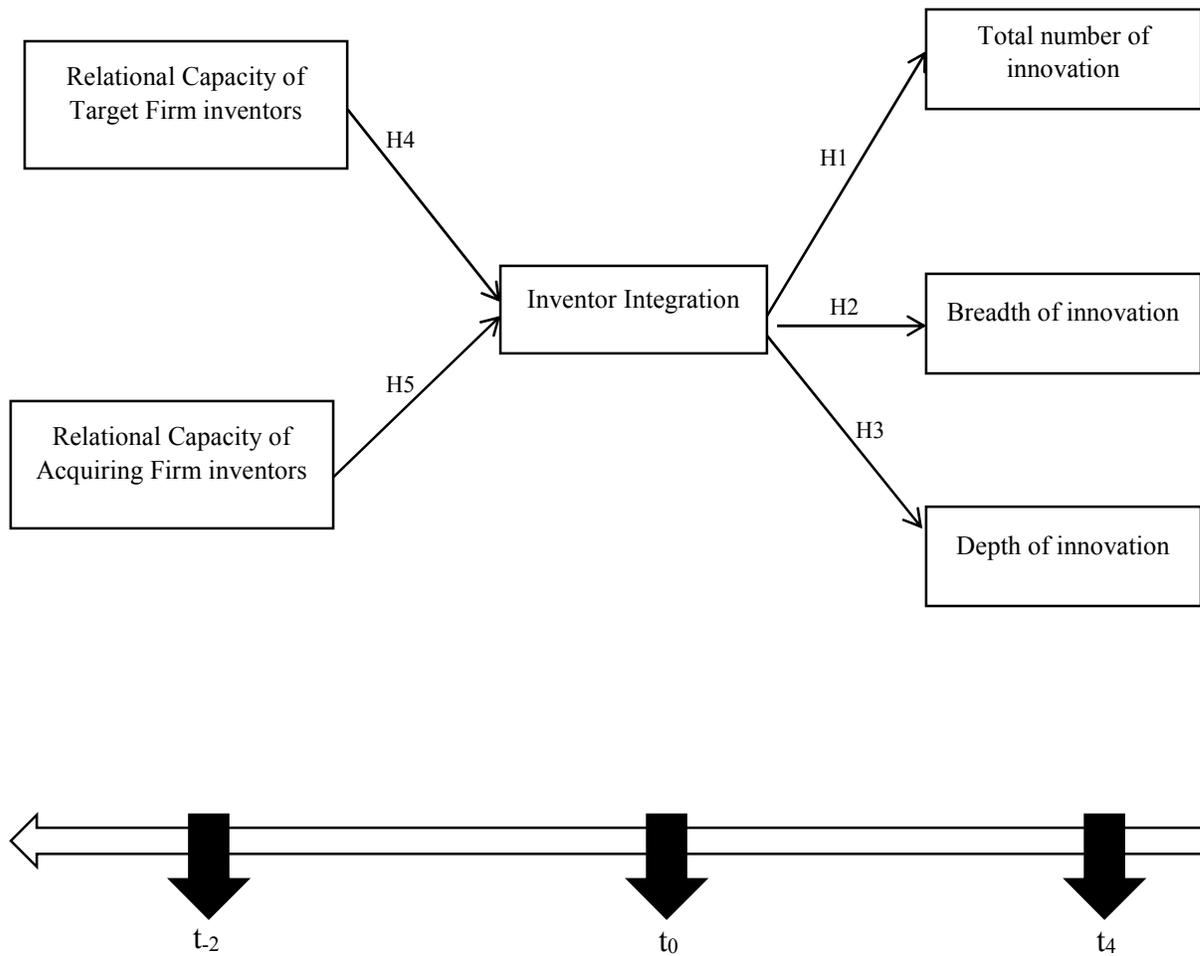
Chapter 1 - Figure 2: Absorptive Capacity



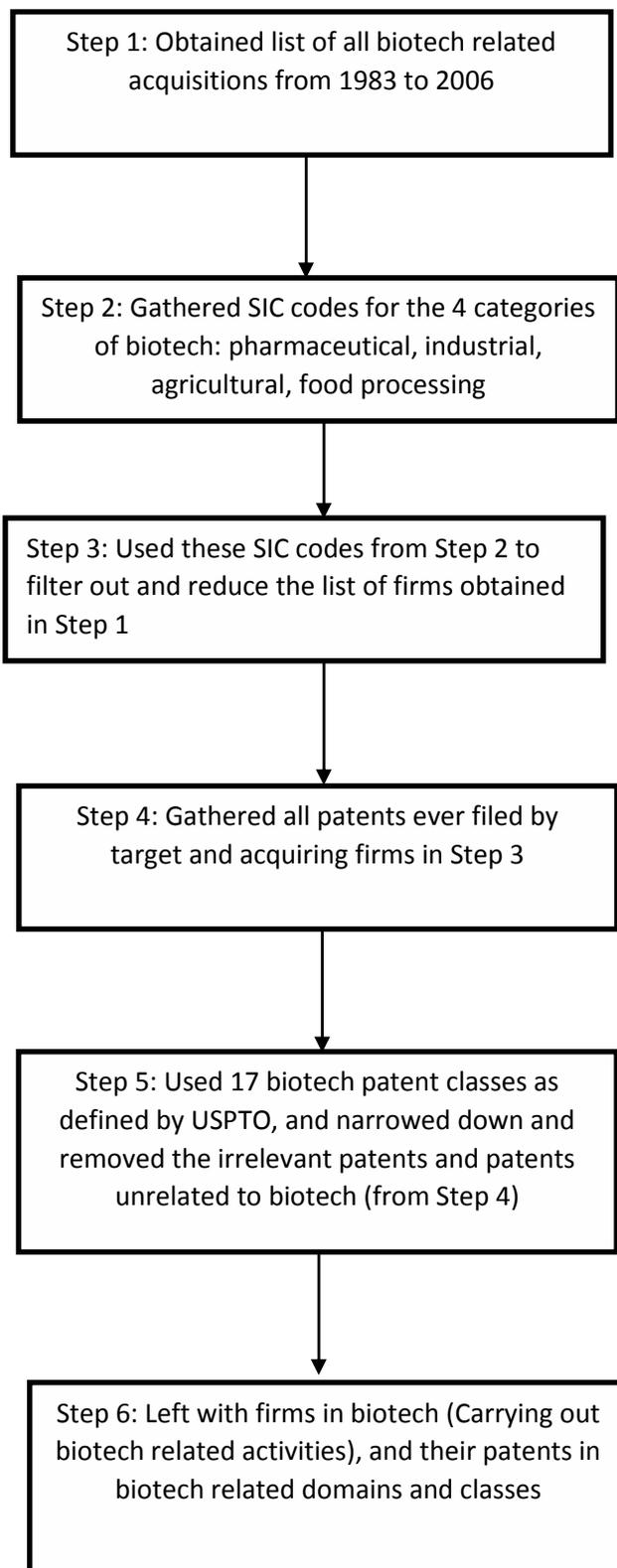
Chapter 2 - Figure 3: Framework of Cooperation and Competition



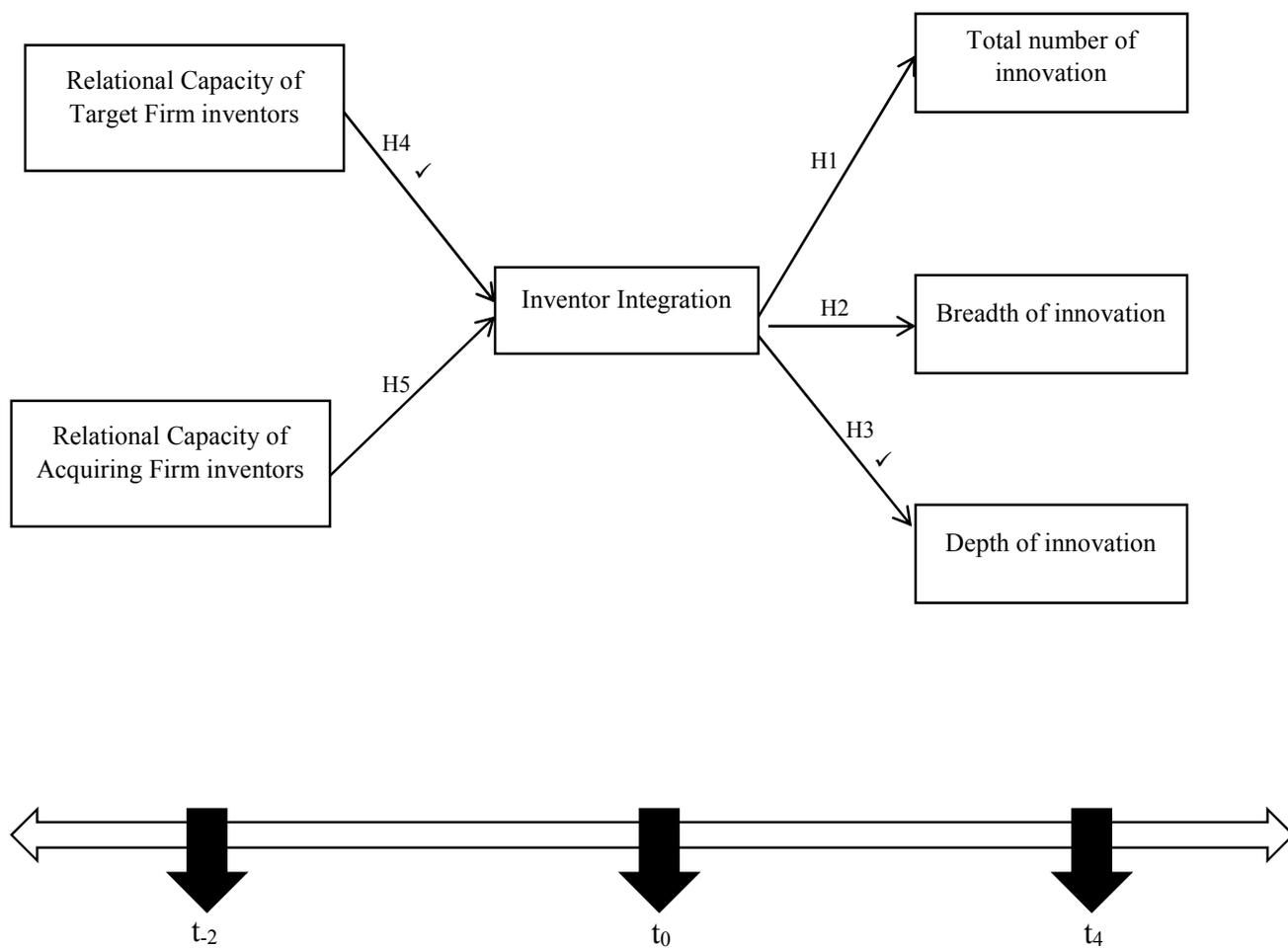
Chapter 3 - Figure 4: Conceptual Model



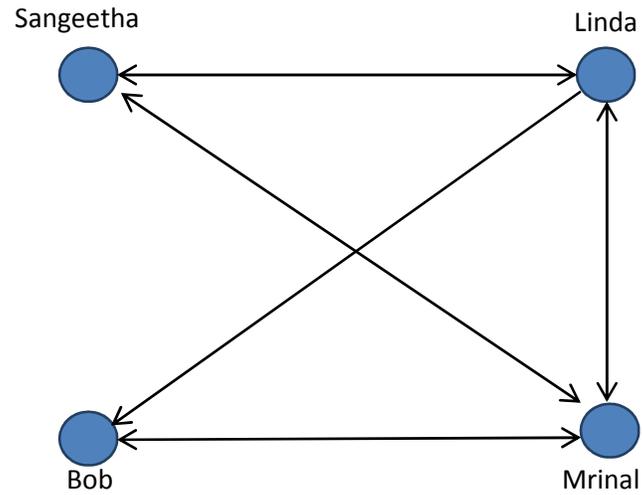
Chapter 3 - Figure 5: Data Collection Process



Chapter 3 – Figure 6: Results of the Path Analysis



Chapter 3 - Figure 7: Demonstration of the process through which zero and one-degree ties were calculated



| | Sangeetha | Linda | Bob | Mrinal |
|-----------|-----------|-------|-----|--------|
| Sangeetha | - | 1 | 0 | 1 |
| Linda | 1 | - | 1 | 1 |
| Bob | 0 | 1 | - | 1 |
| Mrinal | 1 | 1 | 1 | - |

Adjacency Matrix =

$$\begin{pmatrix} 0 & 1 & 0 & 1 \\ 1 & 0 & 1 & 1 \\ 0 & 1 & 0 & 1 \\ 1 & 1 & 1 & 0 \end{pmatrix}$$

Total zero-degree connections:
(Row count)

Sangeetha: 2
Linda: 3
Bob: 2
Mrinal: 3

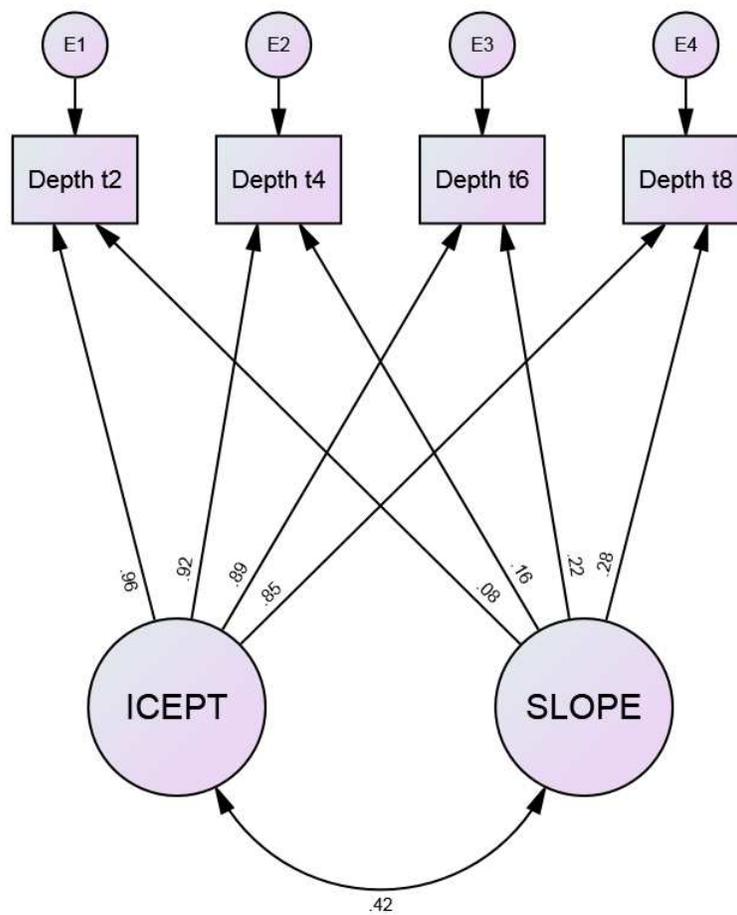
Adjacency Matrix² =

$$\begin{pmatrix} 2 & 1 & 2 & 1 \\ 1 & 3 & 1 & 2 \\ 2 & 1 & 2 & 1 \\ 1 & 2 & 1 & 3 \end{pmatrix}$$

Total one-degree connections:
(Row count)

Sangeetha: 1
Linda: 0
Bob: 1
Mrinal: 0

Chapter 3 - Figure 8: Latent Growth Curve Model



Chapter 1 - Table 1: Definition of Capabilities

| Author(s) | Definition |
|---|---|
| Dierks and Cool 1989 | Glue that brings the assets and resources together and enables them to be deployed advantageously. |
| Amit and Schoemaker 1993 | Tangible or intangible assets which are firm-specific, created over time through complex interactions among the firm's resources, and based on developing, carrying, and exchanging information through the firm's human capital. |
| James et al 1998 | An ability to perform a certain business activity. |
| Ethiraj et al 2005 & Bingham et al 2007 | Capabilities involve complex, coordinated patterns of skills and knowledge that become embedded as routines over time (Grant 1996) and are distinguished from other organizational processes as they are performed better than those of their rivals. |
| Wang and Ahmed 2007 | Capabilities refer to a firm's capacity to deploy resources, usually in combination, and encapsulate both explicit processes and those tacit elements (such as know-how and leadership) embedded in the processes. |
| Grant 1993 | Capabilities are complex patterns of routines and processes that constitute what an organization does well. |

Chapter 1 - Table 2: Definitions of Dynamic Capabilities

| Paper | Definition |
|---------------------------------------|---|
| Amit and Schoemaker (1993) | Tangible or intangible assets which are firm-specific, created over time through complex interactions among the firm's resources, and based on developing, carrying, and exchanging information through the firm's human capital. |
| James, Georghiou, and Metcalfe (1998) | An ability to perform a certain business activity. |
| Day 2011 | Glue that brings the assets and resources together and enables them to be deployed advantageously (Day 1994; Dierkx and Cool 1989) |
| Helfat 2007, p.5 | Capacity of the organization to purposefully extend, or modify the resource base. |
| Newey and Zahra 2009 | Ability of the firm to reconfigure operating capabilities and thus allowing the org to adapt and evolve. |
| Teece 1997 | Firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments. |
| Augier & Teece 2009 | The ability to sense and then seize new opportunities, and to reconfigure and protect knowledge assets, competencies, and complimentary assets with the aim of achieving a sustained competitive advantage. (Slightly modified version from Teece et al 1997). |
| Ambrosini et al 2009 | The capacity of an organization to purposefully create, extend or modify its resource base (Helfat et al 2007, p. 1) |
| Anand et al 2009 | A learned and stable pattern of collective activity through which the organization systematically generates and modifies its operating routines in pursuit of improved effectiveness (Zollo & Winter, pg. 340) |
| King & Tucci 2002 | Organizational and strategic routines by which firms achieve new resource configurations as markets emerge (Eisenhardt & Martin 2000) |
| McKelvie & Davidsson 2009 | Seen as the firm's ability to integrate and change resource bases to address changing environments. DC can be seen as those processes where resources are acquired, integrated, transformed, or reconfigured to generate new value- creating firm-based activities (Eisenhardt & Martin 2000; Teece et al 1997) |
| Zahra et al 2006 | Ability to change or reconfigure substantive capabilities. (Substantive capabilities: set of abilities and resources that go into solving a problem or achieving an outcome). |
| Eisenhardt & Martin 2000 | The firm's processes that use resources- specifically to |

| | |
|--------------------------------------|---|
| | integrate, reconfigure, gain and release resources- to match and even create market change. DC are thus organizational and strategic routines by which firms achieve new resource configurations as markets emerge, collide, split, evolve, and die. |
| Wang and Ahmed 2007 | A firm's behavioral orientation constantly to integrate, reconfigure, renew and recreate its resources and capabilities and, most importantly, upgrade and reconstruct its core capabilities in response to the changing environment to attain and sustain competitive advantage. |
| Teece, Pisano and Shuen 1997, p. 515 | 'The capacity to renew competencies so as to achieve congruence with the changing business environment' by 'adapting, integrating, and reconfiguring internal and external organizational skills, resources, and functional competencies' |
| Zollo & Winter 2002, p. 340 | A learned and stable pattern of collective activity through which the organization systematically generates and modifies its operating routines in pursuit of improved effectiveness. |

Chapter 1 - Table 3: Definitions of variables associated with Dynamic Capabilities

| Variables | Definitions |
|---------------------------|--|
| Transactive Memory System | A transactive memory system refers to a shared system that individuals in groups and organizations develop to collectively encode, store, and retrieve information or knowledge in different domains (Wagner 1987) |
| Continuous Improvement | A systematic effort to seek out and apply new ways of doing work that is, actively and repeatedly making process improvements (Anand et al 2009). |
| Knowledge Articulation | A process by which organizations determine the effectiveness of particular organizational approaches and communicate this information throughout the organization (Levinthal & March 1993; Zollo & Winter 2002). |
| Knowledge Codification | A process by which organizations document understanding of the effectiveness of specific processes (Macher & Mowery 2009). |
| Managerial Capabilities | The ability of a manager to sense the environment and seize and act upon the opportunities (Ambrosini & Bowman 2009). |
| Endogenous Planning | Firm's initiatives in developing new products, services and/or businesses arising from the firm's own internal opportunity recognition (Shane and Venkataraman 2000). |
| Social Capital | Ability of actors to secure benefits by virtue of membership in social networks (Portes 1998). |
| Operating Capability | Capabilities that enable the firm to execute its main operating activities, such as making and selling products or delivering services (Helfat & Peteraf 2003; Winter 2003; Zahra et al 2006). |
| Evolutionary Fit | How well the capability enables the firm to make a living (Helfat et al 2009). |

Chapter 1 - Table 4: Definitions of Absorptive Capacity

| Paper | Definition |
|------------------------------------|---|
| Lichtenthaler 2009 | A firm's ability to utilize external knowledge through sequential processes of explorative, transformative, & exploitative learning (Lane, Koka, & Pathak 2006). |
| Lichtenthaler & Lichtenthaler 2009 | Firm's ability to explore external knowledge. |
| Chen et al 2009 | The ability to acquire, to assimilate, to transform, and to exploit knowledge which may determine its level of organizational innovation and competence (Cohen & Levinthal 1990; Daghfous 2004; Fichman 2004; Vinding 2006) |
| Kostopoulos et al 2011 | Ability to recognize the value of new information, assimilate it, and apply it to commercial ends (Cohen and Levinthal 1990, pg. 128) |
| Zahra et al 2009 | Denotes a firm's ability to identify, accumulate, process and use the new knowledge gained from external sources. |
| Harris & Cher Li 2008 | Ability to exploit knowledge (obtained both internally and externally) that is embodied in intangible assets, with the latter being recognized as a key driver of enterprise performance. |
| De Jong & Freel 2010 | A firm's ability to recognize and use external knowledge. |
| King, Slotegraaf & Kesner 2008 | Ability to recognize, assimilate, and convert new information to commercial ends. |
| Ecsribano, Fosfuri, & Tribo 2009 | The ability to recognize the value of external knowledge, assimilate it, and apply it to commercial ends. |
| Rothaermal & Alexandre 2009 | The extent to which a firm can screen, value, and utilize externally sourced technologies. |

Chapter 1 - Table 5: Definitions of variables associated with Absorptive Capacity

| Variables | Definitions |
|-------------------------------|---|
| Social integration mechanisms | Refers to mechanisms that can facilitate the sharing and eventual exploitation of knowledge (Zahra & George 2002). |
| Appropriability regimes | Refers to the institutional and industry dynamics that affect the firm's ability to protect the advantages of (and benefit from) new products or processes (Antonelli 1999; Buzzacchi, Colombo, & Mariotti 1995). |
| Technological turbulence | Refers to the rate of technological change (Jaworski & Kohli 1993; Lichtenthaler & Ernst 2007). |
| Market turbulence | Refers to the degree of instability and uncertainty within a firm's markets (Helfat et al 2007; Jaworski & Kohli 1993). |

Chapter 2 - Table 6: Illustrative Actor- Assemblage Capacities

| Assemblage | Types of Capacity | Low ← | → High |
|----------------------------|-------------------|--|---|
| Cosmetic Brand Assemblage | Material | Vera on Clarins: "It is a small line. So it is not easy. It is not very popular in this area" | Vera on Estee Lauder: "Bigger account, more opportunities, more sale," "It is very popular over the border". |
| | Expressive | Vera on Chanel: "There was too much confusion at that time. It was too disorganized." | Nina on Clinique: "Clinique is a wonderful brand, we are always going to have customers for Clinique." |
| Store Assemblage | Material | Heather in Macy's commission: "I get a slightly less commission for anything that is not Clinique." | Heather on Macy's: "In order to get a raise or promotion or something like that, because I am a Macy's employee, I have to meet these goals." |
| | Expressive | Miriam on Macy's: "I feel like a number here" | Marianna on Macy's: "Every once in a while a manager..they give us little notes out when they see us doing something good." "if they see us being really helpful to someone, they will acknowledge it." |
| Individual Representatives | Material | Vera: "I worked 4 days not 5" Miriam: "2 year old baby", "Going to school for a nursing". | Vera: "I speak Spanish, Portuguese, Italian, and French." Miriam on other representatives: "They always have an eye on the counter." "They have an eye on the back of their heads". |
| | Expressive | Vera about the counter manager at Estee Lauder: "I think it was hard for her to work with a person that was new and was doing so well." | Nina: "I come in and feel more like a counselor sometimes." |
| Other Actors | Material | Miriam on entrepreneurs: "There are other operational things too like arranging cases, making sure everything is in the drawer, but there are some sales people who are very sales oriented." "They are the ones eager to sell, but they are not eager to help or do other things at the counter." | Miriam: "We have what we call areas of pride. Our counter manager assigns us different areas of the bays that we are in charge of, and we have a tester unit that we are in charge of." |
| | Expressive | Miriam: "Every once in a while, you get a difficult customer, but you just have to let it roll off your back. You can't let customers bother you." | Heather: "We try not to sell other counter products because those girls need their commission. So we want them to have their sales." Miriam: "We can ring it up our self but we all have a lot of respect for each other." |

Chapter 2 - Table 7: Territorializing processes by different actors

Table 7a: Instances of territorializing processes by brand that diminishes the effect of store territorializing processes, and promotes competition of embedded sales people with other store and brand assemblages:

| | |
|----------------------------|---|
| Rewards | <i>“Every 4 months, we get to spend money to get our skin care online. So that’s kind of our gift from Clinique.” (Miriam – Clinique)</i> |
| Training | <i>“Clinique does that. They put us in a store, they pay for our food, the night out, and then the next day they pay for our food as well. It is like a small get away. It is kind of nice.” (Nina- Clinique)</i> |
| Commission | <i>“I mean even if I did ring something from Estee Lauder if no one was there, I get only 2% commission. So it’s a smaller commission than when I am ringing up any other area. So I think that deters people from helping out.” (Miriam- Clinique)</i> |
| Other practices/ behaviors | <i>“[During training] They ask me to stand up and talk because they say I have a lot of traffic and I sell very well with each customer. So they ask me to talk in class. They appreciate me a lot.” (Blanca- Dior)</i> |

Chapter 2 - Table 7b: Instances of territorializing processes by store that diminishes the effect of brand territorializing processes, and promotes cooperation among embedded sales force (across multiple brand assemblages):

| | |
|----------------------------|--|
| Training | <p><i>“Immediately (after recruitment) I had my Macy’s training, which was on the computer – learning how to use the register and also just getting to know what the store is all about and more of the background.” (Miriam-Clinique)</i></p> <p><i>“We have training constantly – on how to talk to customers, how to get information from them, how to make them comfortable.” (Iris- Estee Lauder)</i></p> |
| Commission | <p><i>“Yeah. Not all the stores work the same way but Macy’s does. They give you the same commission.” (Marianna- Elizabeth Arden)</i></p> |
| Other practices/ behaviors | <p><i>“Every once in a while, the manager gives us little notes when they see us doing something good or they see you being really helpful to someone. They will acknowledge it. They are good about that.” (Marianna – Elizabeth Arden)</i></p> <p><i>“One thing I could say is when I first started here, they used to have potlucks and the girls would get together and talk. That would break the ice. They would go “Oh! How did you make that? That tastes very nice”. It broke the ice and kept the communication lines open.” (Mica – On-call person)</i></p> |

Chapter 3 - Table 8 (17 patent classes)

| PATENT CLASS | CLASSIFICATION AS PER USPTO |
|---------------------|---|
| 047 | Plant Husbandry |
| 119 | Animal Husbandry |
| 127 | Sugar, starch, and carbohydrates |
| 131 | Tobacco |
| 424 | Drug, bio-affecting and body treating compositions |
| 426 | Food or edible material: processes, compositions, and products |
| 435 | Chemistry: Molecular biology and microbiology |
| 436 | Chemistry: Analytical and immunological testing |
| 504 | Plant protecting and regulating compositions |
| 800 | Multicellular living organisms and unmodified parts thereof and related processes |
| 930 | Peptide or protein sequence |
| 977 | Nanotechnology |
| 554 | Organic compounds |
| 562 | Organic compounds |
| 546 | Organic compounds |
| 560 | Organic compounds |

Chapter 3 - Table 9: Results of Path Analysis

| Relationships | | Estimate | S.E. | C.R. | P |
|---|---|-----------------|-------------|-------------|----------|
| Inv integration (t ₀) | <--- AF's R&D (t ₋₂) | .245 | .101 | 2.422 | .015 |
| Inv integration (t ₀) | <--- Relational capacity of AF inventors (t ₋₂) | .000 | .000 | -1.210 | .226 |
| Inv integration (t ₀) | <--- Relational capacity of TF inventors (t ₋₂) | .006 | .001 | 4.797 | *** |
| Inv integration (t ₀) | <--- AF's size (t ₋₂) | .857 | 4.700 | .182 | .855 |
| Total number of patents (t ₄) | <--- Inv integration (t ₀) | .033 | .023 | 1.468 | .142 |
| Breadth of patents (t ₄) | <--- Inv integration (t ₀) | -.001 | .001 | -.643 | .520 |
| Depth of patents (t ₄) | <--- Inv integration (t ₀) | .038 | .008 | 4.452 | *** |
| Total number of patents (t ₄) | <--- AF's R&D (t ₋₂) | -.012 | .023 | -.533 | .594 |
| Breadth of patents (t ₄) | <--- AF's R&D (t ₋₂) | -.001 | .001 | -.711 | .477 |
| Depth of patents (t ₄) | <--- AF's R&D (t ₋₂) | -.005 | .009 | -.626 | .531 |
| Total number of patents (t ₄) | <--- Relational capacity of AF inventors (t ₋₂) | .000 | .000 | -1.449 | .147 |
| Breadth of patents (t ₄) | <--- Relational capacity of AF inventors (t ₋₂) | .000 | .000 | -1.689 | .091 |
| Depth of patents (t ₄) | <--- Relational capacity of AF inventors (t ₋₂) | .000 | .000 | 2.476 | .013 |
| Total number of patents (t ₄) | <--- Relational capacity of TF inventors (t ₋₂) | .000 | .000 | -.897 | .370 |
| Breadth of patents (t ₄) | <--- Relational capacity of TF inventors (t ₋₂) | .000 | .000 | -.544 | .586 |
| Depth of patents (t ₄) | <--- Relational capacity of TF inventors (t ₋₂) | .000 | .000 | -2.568 | .010 |
| Total number of patents (t ₄) | <--- AF's size (t ₋₂) | 3.597 | 1.023 | 3.517 | *** |
| Breadth of patents (t ₄) | <--- AF's size (t ₋₂) | .131 | .047 | 2.754 | .006 |
| Depth of patents (t ₄) | <--- AF's size (t ₋₂) | .112 | .387 | .289 | .773 |

Chapter 3 - Table 10: Covariance of the independent variables

| COVARIANCES | | | Estimate | S.E. | C.R. | P |
|---|------|---|-----------------|----------------|-------|------|
| Relational capacity of AF inventors (t ₂) | <--> | Relational capacity of TF inventors (t ₂) | 11137331005.481 | 3979005085.569 | 2.799 | .005 |
| Relational capacity of AF inventors (t ₂) | <--> | AF's size (t ₂) | 4288919.776 | 1508900.693 | 2.842 | .004 |
| AF's R&D (t ₂) | <--> | AF's size (t ₂) | 38660.641 | 7157.311 | 5.402 | *** |
| Relational capacity of TF inventors (t ₂) | <--> | AF's size (t ₂) | -136200.394 | 277196.145 | -.491 | .623 |
| AF's R&D (t ₂) | <--> | Relational capacity of TF inventors (t ₂) | 9820361.613 | 15708498.395 | .625 | .532 |
| AF's R&D (t ₂) | <--> | Relational capacity of AF inventors (t ₂) | 503710445.923 | 96807904.779 | 5.203 | *** |

Chapter 3 - Table 11: Latent Growth Curve Model
Means: (Group number 1 - Default model)

| | Estimate | S.E. | C.R. | P | Label |
|-------|----------|--------|-------|-----|-------|
| ICEPT | 369.471 | 48.374 | 7.638 | *** | |
| SLOPE | 13.023 | 2.053 | 6.342 | *** | |

Covariances: (Group number 1 - Default model)

| | Estimate | S.E. | C.R. | P | Label |
|------------------|----------|----------|-------|-----|------------|
| ICEPT <--> SLOPE | 4326.193 | 1100.443 | 3.931 | *** | covariance |

| | Estimate |
|------------------|----------|
| ICEPT <--> SLOPE | .419 |

| | Estimate | S.E. | C.R. | P | Label |
|-------|------------|-----------|--------|-----|-----------|
| ICEPT | 245442.644 | 33909.284 | 7.238 | *** | IVariance |
| SLOPE | 434.662 | 61.109 | 7.113 | *** | SVariance |
| E1 | 161.205 | 15.733 | 10.246 | *** | Var |
| E2 | 161.205 | 15.733 | 10.246 | *** | Var |
| E3 | 161.205 | 15.733 | 10.246 | *** | Var |
| E4 | 161.205 | 15.733 | 10.246 | *** | Var |

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