New Ventures' Network Development: Antecedents and Outcomes

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Contents

List of Tables

List of Figures

Chapter 1

Introduction

In this thesis, I explore the topic of new ventures' network development as well as its antecedents and outcomes. Specifically, I address the following questions: a) Can entrepreneurs pursue new ventures' network development processes and, if so, how? b) Do network development processes impact new venture performance and, if so, how and why? Before addressing these questions, this Chapter aims to integrate the studies included in this dissertation into the wider picture of entrepreneurship research. The Chapter begins with an outline of entrepreneurship research and new venture development. The focus is subsequently narrowed until, finally, I introduce my research questions. I will then address the questions in the studies described in Chapters four through six, which I conducted together with three different co-researchers: Thorsten Semrau, Mark Ebers and Douglas Wegner. Prior versions of my studies have been presented at leading international conferences, such as the Academy of Management Meeting and the European Academy of Management Conference.

Table 1.1 provides an overview of authors, datasets in use, and the current status of the different studies.

Table 1.1: Overview of Studies

1	**Networking Ability and the Financial Performance of New Ventures: A Mediation Analysis among Younger and More-Mature Firms**		
	Thorsten Semrau Stefan Sigmund	Structural Equation Modeling 146 new ventures from Germany	Forthcoming in Strategic Entrepreneurship Journal (SEJ)
2	**Networking Ability and the Financial Performance of New Ventures: Moderating Effects of Venture Size, Institutional Environment, and their Interaction**		
	Stefan Sigmund Thorsten Semrau Douglas Wegner	Moderated Regression Analysis 283 new ventures from Germany and Brazil	Forthcoming in Journal of Small Business Management (JSBM)
3	**Identity-Based vs. Calculative Ties: A Comparative Analysis of Their Impact on New Venture Financial Performance**		
	Stefan Sigmund	Hierarchical Regression Analysis 156 new ventures from Germany	Working paper
4	**Exploration and Exploitation in Network Development: How Ambidexterity Affects New Venture Performance**		
	Mark Ebers Thorsten Semrau Stefan Sigmund	Logistic Random Effects Panel Regression PSED II dataset	Revise and Resubmit in Journal of Business Venturing (JBV)
5	**Contextual vs. Temporal Ambidexterity in Network Development: Which Provides the Better Pathway to Enhancing New Ventures' Financial Performance?**		
	Thorsten Semrau Stefan Sigmund Mark Ebers	Logistic Random Effects Panel Regression PSED II dataset	Working Paper

1.1. Entrepreneurship and New Ventures

Scholars have frequently questioned, either implicitly or explicitly, why anyone should study entrepreneurship. The underlying theory is underdeveloped, data is difficult to collect, and many findings are similar to those in other research areas. In response, Shane and Venkataraman (2000) offer three good reasons for studying entrepreneurship. First, entrepreneurship is a mechanism that helps society achieve technical progress, as entrepreneurs convert technical information into products and services. Second, entrepreneurship is a mechanism that discovers and mitigates spatial as well as temporal inefficiencies in an economy. Third, as Schumpeter (1934) argues, entrepreneurially driven innovation drives change processes. As a result, business research without the study of entrepreneurship would be incomplete.

The demarcation between entrepreneurs and non-entrepreneurs has been discussed extensively in entrepreneurship research (Carland, Hoy, Boulton, & Carland, 1984; Gartner, 1985; Shaver & Scott, 1991). It has been argued that it is necessary to theoretically and empirically separate small businesses from entrepreneurial ventures by relying on the criterion of growth-orientation and innovativeness (Carland, Hoy, & Carland, 1988). However, it has been pointed out that such a narrow definition of entrepreneurship is associated with difficulties, such as assessing the level of innovativeness of services and products, or methods (Gartner, 1988). As a result, scholars widely agree on the use of the criterion of new venture creation to delineate entrepreneurship research from other research disciplines (Aldrich, 1999; Shane, 2003; Vanderwerf & Brush, 1989). Therefore, I based my thesis on this general description of entrepreneurship research.

The process of new venture creation has been examined by addressing behaviors or tasks that are associated with founding a venture. As a major contribution, authors have developed stage and phase models that describe new venture formation and subsequent growth. The process is generally described as having two major transitions—namely conception and firm birth (Reynolds, 2007; Wilken, 1979). The former is triggered when the founding individuals proceed from thinking about starting a new venture to engaging in activities that are directed at reaching the objective of founding; the latter begins when the nascent entrepreneur succeeds in actually creating a new venture (Aldrich, 1999; Carter, Gartner, & Reynolds, 1996; Reynolds, Carter, Gartner, & Greene, 2004). Even though the process does not appear to emerge in the linear and predictable manner of sequential steps (Liao, Welsch, & Tan, 2005), researchers widely agree that a certain set of activities, such as organizing a founding team and preparing a business plan, are typical for engaging in the founding process (Reynolds & Miller, 1992). The same is true regarding the second transition—firm birth has been associated with activities such as

registration of a legal entity or generating first sales (Reynolds, 2011). As described in the method sections of the following studies, I relied on this widespread classification when selecting new ventures for the empirical analyses.

In terms of new venture development, researchers have also developed models of new venture growth. Greiner (1972) established a five phase model in which each phase characterizes specific management problems with which a new venture must cope in order to achieve continuous growth. Similarly, Churchill and Lewis (1983) describe five stages through which small companies pass while growing. Each stage is characterized by certain levels of business size, organizational goals, and a specific management style (Churchill & Lewis, 1983). Finally, Ruhnka and Young (1987) developed a process model of new venture development by analyzing the interview data of 73 U.S. venture capital firms. They identified five distinct stages of new venture development, each associated with specific risks and developmental goals (Ruhnka & Young, 1987).

A question that has attracted considerable attention in entrepreneurship research over the last years asks: "Why are some entrepreneurs [and their new ventures] more successful than others in exploiting opportunities they have discovered?" (Baron & Markman, 2003:42). However, one should bear in mind that success and performance for new ventures is not the same as for established firms. Specifically, the conception of new venture performance comprises constructs such as survival, initial profitability, (initial) revenue, revenue growth, and employment growth (Brush & Vanderwerf, 1992). The rationale for this deviant perception of venture performance is that, for newly founded ventures, outcomes such as continuous survival, revenue growth, and periods of initial profitability reflect important aspects of development as well as the potential to continuously succeed (Reynolds, 2011).

When attempting to generate answers to the above mentioned question, scholars focus their efforts primarily on four interrelated dimensions: a) characteristics of the founder(s); b) the organization created; c) the process by which a new venture is developed; and d) the new venture environment.

Recent research revealed that none of these factors alone can account for new venture success (Brush, Manolova, & Edelman, 2008; Frank, Lueger, & Korunka, 2007; Korunka, Frank, Lueger, & Mugler, 2003; Song, Podoynitsyna, van der Bij, & Halman, 2008). Nevertheless, other studies have found that some factors partially explain new venture performance. In the following, I will briefly summarize the major findings.

In terms of the characteristics of the individual(s) starting the new venture, research has attempted to explain differences in entrepreneurial outcomes by examining founders' personalities and personal histories. Even though its value has

been frequently questioned, several studies following this approach confirmed that some psychological variables, such as risk taking propensity, internal locus of control, and confidence in one's skills, are significantly associated with new venture performance (Rauch & Frese, 2007; Shaver & Scott, 1991; Walter & Walter, 2009).

Another popular approach is to examine the influence of founders' human capital. For example, several studies indicate that years of education, work experience, industry experience, and entrepreneurial experience foster new venture survival and growth (Brüderl, Preisendörfer, & Ziegler, 1992; Colombo & Grilli, 2005).

With regard to the association between organizational variables and new venture performance, aspects such as the strategic orientation and organizational structure have been found to be relevant. Specifically, results indicate that the technological strategy (Newbert, Kirchhoff, & Walsh, 2007) as well as strategic differences such as differentiation on quality versus cost leadership (Chandler & Hanks, 1994b) significantly influence the performance of new ventures. Furthermore, Meijaard, Brand, and Mosselman (2005) conclude that the performance of new ventures might be related to their organizational structure.

Finally, researchers have also examined how certain environmental characteristics affect new venture performance. Specifically, studies examined how an association with institutions such as business incubators, science parks, and universities affect new venture performance (Aernoudt, 2004; Mian, 1997; Phan, Siegel, & Wright, 2005). Results indicate that technology transfer between ventures and universities is positively associated with new venture performance (Markman, Phan, Balkin, & Gianiodis, 2005). In a similar vein, results also indicate that new venture performance is influenced by new ventures' networks (for recent overviews, see, e.g., Hoang & Antoncic, 2003; Street & Cameron, 2007). The relevance of this factor for new venture success is described in the next section.

1.2. New Ventures and Networks

Approximately 25 years ago, research on networks in entrepreneurship emerged prominently. In 1986, Aldrich and Zimmer argued that every entrepreneur is embedded in a network that plays an important role for the development of a new venture. A network is defined as a set of individuals and organizations as well as the linkages between these actors (Hoang & Antoncic, 2003; Lechner, Dowling, & Welpe, 2006).

The rationale given for the critical role of networks with regard to new venture success is simple: networks are seen as an avenue to acquire resources. More specifically, they potentially provide resources to better conditions than market

exchange or vertical integration (Larson, 1992; Uzzi, 1999; Uzzi & Lancaster, 2004). Thus, networks are especially important for new ventures, which typically suffer from severe resource constraints (Aldrich, 1999; Batjargal, 2005; Hite & Hesterly, 2001; Steier & Greenwood, 1995).

When examining the association between exchange networks, defined as the set of a new venture's exchange relationships that goes beyond simple market exchange (Hite & Hesterly, 2001; Lee, Lee, & Pennings, 2001), and new venture performance, researchers focus mostly on exchange network characteristics, such as size and the position, intensity, and quality of relationships. For instance, in a study based on a sample of Chinese entrepreneurs, Zhao and Aram (1995) found that the extensive use of networks distinguished high-growth from low-growth ventures. Likewise, among firms in Singapore, researchers found that venture growth is associated with the number of partners a venture can rely on (Lee & Tsang, 2001).

Drawing on Burt's structural hole argument (1992)—which suggests an advantage to occupying a bridging position within the network due to the increased likelihood of receiving resources sooner than others—studies revealed, for instance, that lower-density-networks (McEvily & Zaheer, 1999) and exchange partner heterogeneity (Baum, Calabrese, & Silverman, 2000) are positively associated with competitiveness and new venture performance (as measured by revenues).

With regard to relationship intensity and quality, the dichotomy of strong and weak ties has attracted considerable attention. A lasting debate about the relative value of strong versus weak ties has emerged (Hoang & Antoncic, 2003). While several studies have underscored the value of weak ties (Batjargal, 2003; Granovetter, 1973; Ruef, 2002), a study conducted by Brüderl and Preisendorfer (1998) found that strong ties (as measured by self-reports of support from family and friends) were more critical to venture survival than weak ties (proxied as support from acquaintances). It is noteworthy that effects of networks and ties appear to vary with the outcome of focus. The above mentioned study by Brüderl and Preisendorfer (1998) studied effects of strong ties on venture survival and financial outcomes. They found stronger effects on survival, indicating that the effects associated with exchange network ties may not be equal across measures of new venture performance. In light of these findings, Hoang and Antoncic (2003) conclude that if, as Uzzi's (1996, 1997) research seems to propose, ventures benefit from a mixture of different types of ties, then one must further investigate their respective outcomes.

However, in terms of a resolution of the debate regarding strong and weak ties, a contingency approach might be valuable. For example, the founding stage of a new venture may influence the relevance of strong or weak exchange ties—a focus on strong ties might be more valuable during an early growth stage when such ties are in

place as reliable, low-cost links to critical resources (Starr & Macmillan, 1990). Indeed recent studies point to the fact that, in the course of a new venture's development, the founders might have to adapt the venture's exchange network according to changing resource needs in order to reach performance and growth targets (Hite, 2005; Hite & Hesterly, 2001).

I will address the relevance of exchange network development processes for new ventures as well as its antecedents in following section. Furthermore, I will elaborate on the network development-related research questions addressed in this thesis.

1.3. Network Development and Its Antecedents and Outcomes

Recently, researchers have been called to view networks as a dynamic phenomenon. Thus, researchers should focus on exchange network development processes rather than an alleged static set of ties (Hoang & Antoncic, 2003; Jack, Dodd, & Anderson, 2008; Slotte-Kock & Coviello, 2010). Again, the reasoning underlying this notion is straightforward. In the course of a new venture's development, the venture must cope with change (Churchill & Lewis, 1983). The network that was present when the venture was founded often may not be able to provide all the resources necessary during the venture's progress. Therefore, new ventures must adapt their network according to the changing requirements, in order to be able to achieve growth and performance goals (Lechner & Dowling, 2003; Witt, 2004).

In this manner, Hite and Hesterly (2001) and Larson and Starr (Larson & Starr, 1993) bring forward two eminent conceptual studies concerning the process of network development. Larson and Starr (1993) argue that the entrepreneurial network develops through different stages, in which each stage involves adding, developing, and dropping ties. The ties that prove valuable are developed from one-dimensional dyadic exchange ties to a dense set of multidimensional and multilayered ties, thus increasing complexity. The authors suggest that the venture usually relies on ties with family and friends in early phases. However, mutual business interests eventually gain relevance, causing social and business relationships to overlap. The authors further argue that this evolution is driven by the entrepreneurs and shaped by their social context.

In their more recent conceptualization, Hite and Hesterly (2001) argue that initial networks will be composed primarily of identity based ties that were already apparent before the venture was founded. As the firm develops the network changes and contains a growing number of exchange ties that are intentionally managed. Thus, Hite and Hesterly (2001) argue that the venture's exchange network shifts from being

dominated by intense socially embedded ties that stem from a period prior to founding, to containing a mixture of identity-based and arm-length ties that have been added after the venture was founded. In other words, the network changes form being path-dependent to being intentionally managed. In terms of the consequences of this shift, Hite and Hesterly argue that both subgroups of ties fulfill different duties. While identity-based ties are essential in the emergence stage of the venture, the calculative ties are essential for new venture development.

Therefore, both conceptualizations argue that the exchange network will be based on strong embedded ties in the beginning and will evolve in time. Although they are not necessarily contradictory, both studies have important differences. While Hite and Hesterly (2001) propose that economically motivated arm-length ties will be more dominant in later stages of venture development, Larson and Starr (1993) suggest that one-dimensional ties (either affective or economic) become multiplex, meaning that the friend becomes an investor and the investor a friend. While Hite and Hesterly (2001) suggest that networks become less dense over time, Larson and Starr argue that the network increases in density.

Even though the topic of network development is considered a fruitful avenue for empirical research, neither the implications nor antecedents of performance are currently well understood (Jack, 2010; Slotte-Kock & Coviello, 2010). However, there is some empirical literature that addresses new ventures' exchange network development. Most contributes to understanding the process of network development by focusing either on the antecedents or outcomes of network development (Hoang & Antoncic, 2003). In the following, I will summarize the key-findings.

1.3.1. Antecedents of Network Development

This group of studies focuses mostly on certain aspects of exchange network change, such as an increase of structural holes or the intensity of network change and prevalently analyzes the impact of prior network characteristics, firm characteristics, environmental conditions, and characteristics of the founder(s).

Batjargal (2006) found in a survey study of 75 Russian entrepreneurs that the extent to which network development processes emerge depends on a) initial exchange network size and b) financial performance of previous years. Specifically, he found that the size of a new venture's initial network reduces the changes in network size, diversity, strong ties, weak ties, and resourcefulness over time. Likewise, but even more astonishing, he found evidence that the extent to which changes in the exchange network occur is negatively influenced by the revenue the new venture gained in previous years. He explained his results with the tendency of actors to prefer well-known ties that generated revenue in the past, because they are

less costly and less risky. He also observed a declining number of strong ties in the networks of Russian entrepreneurs. However, one should keep the unique institutional and cultural context of Russia in mind when considering these results.

Analyzing a panel data set of 209 public and private new ventures in the biotechnology industry in the U.S., Milanov and Fernhaber (2009) focused on the imprinting effect of a new venture's initial alliance partner on the subsequent development of the new venture's exchange network. Their results provide support for the notion that the conditions at founding and, specifically, the exchange network at founding affect the subsequent development of the new venture's exchange network. In particular, they found evidence for a positive effect of the size and centrality of the new venture's initial network on the subsequent size of the network at a later time.

Additionally, organization characteristics such as the diversity of the founding team (Beckman, Burton, & O'Reilly, 2007) and the number of patents held by a new venture (Colombo, Grilli, & Piva, 2006; Herneric, Fragg, Hommel, & Witt, 2008) have been found to be associated with the extension of the exchange network.

In terms of environmental characteristics, a longitudinal study examining the effects on the intensity of exchange network development was conducted by Eisenhardt and Schoonhoven (1996) among the population of newly founded semiconductor firms. They found that difficult market conditions, such as markets with many competitors, and risky firm strategies, such as an innovative strategy, increased the rate of alliance formation.

Other studies with this focus observed that new ventures extend their exchange network when they must cope with an uncertain technological environment (Steensma, Marino, & Weaver, 2000) or are affected by network externalities or industry standards (Ahuja, 2000).

In their qualitative study of 44 nascent, novice, and habitual entrepreneurs, Mosey and Wright found that human capital in the form of prior business ownership experience of technology-based entrepreneurs increased the likelihood of building new exchange ties outside scientific communities, which resulted in broader networks with more structural holes. In addition, they concluded that entrepreneurs in early stages of venture development who had been educated in more cooperative environments such as engineering schools were also more likely to build new ties outside of their technology community.

Likewise, the development of a firm's exchange network has been found to be affected by entrepreneurs' family background (Anderson & Miller, 2003) and their attitude towards networking (Neergaard & Madsen, 2004; Sorenson, Folker, & Brigham, 2008).

Another study conducted by Batjargal (2010) on 94 Chinese Entrepreneurs found evidence for an increasing number of structural holes as well as an increasing number of ties to venture capitalists over time, which was positively influenced by the networking skills of the entrepreneur. These findings indicate that network development might also be a function of individual skills. However, institutional, regulatory, and market immaturity in China should be taken into consideration when interpreting these results.

Despite these findings, research regarding the antecedents of new ventures' exchange network development is still underdeveloped (Hoang & Antoncic, 2003; Street & Cameron, 2007). First, there are virtually no studies that analyze how the antecedents of network development affect new venture performance via influencing network structure. Second, there is a lack of research on how entrepreneurs and new ventures as strategic actors may actually influence the development of their exchange network (Ozcan & Eisenhardt, 2009). Third, there is still little knowledge regarding the contingencies of the association between network development and its antecedents, such as environmental characteristics. Finally, there is a lack of studies addressing the interplay between the macro level of exchange network development and the micro level of dyadic interaction (Slotte-Kock & Coviello, 2010).

Chapters two and three of this thesis address these issues. The study presented in Chapter two analyzes how entrepreneurs' individual networking abilities affects new venture financial performance by influencing the size and tie strength of new ventures' exchange networks. In addition, the moderating impact of venture age on the hypothesized relationships is examined to shed light on the boundary conditions of the influence of entrepreneurs' personal attributes on the formation of new ventures' networks and performance. Extending the findings of the study presented in Chapter one, Chapter three analyzes the complex interaction between individual, organizational, and environmental variables. Specifically, we develop and test hypotheses on how venture size and institutional environment as well as their interaction affect the impact of entrepreneurs' networking ability on new ventures' financial performance.

1.3.2. Outcomes of Network Development

This approach models network development as an independent variable that influences new venture development. However, research on this topic, in general, and on the association between exchange network development and new venture performance, in particular, is still very sparse (Slotte-Kock & Coviello, 2010). The few results contributing to understanding this phenomenon are described in the following.

One of the first studies that empirically addressed the performance implications of network development was conducted by Maurer and Ebers (2006). Based on a comparative case analysis, the researchers examined how the evolution, organization, and configuration of entrepreneurs' networks affect firm performance. Inter alia they conclude that the more successful ventures were able to reconfigure their exchange network according to evolving resource needs by adding new ties.

Eisenhardt and Ozcan (2009) examined the development of high-performance networks. In their study, they examined longitudinal interviews of six rivaling new ventures and additional archival data. As a result, they describe different approaches that entrepreneurs follow in order to develop their network. Specifically, they found evidence that new ventures that form exchange ties to disconnect others, rather then using others as stepping stones, achieve greater firm performance.

Lechner and Dowling (2003) focused on different types of exchange network ties (social, marketing, reputational, co-operative, etc.) and developed propositions concerning the benefits that these ties offer in different stages of venture development. In a large scale follow-up study (Lechner et al., 2006), they could partly confirm their argumentation.

A notably study that addresses performance as an outcome of network development processes is a notable survey study conducted by Batjargal (2010) on Chinese and Russian new ventures. The author found that network structural holes negatively impact profit growth in early stages of new venture development.

Although there are some studies that link network development to performance, research about how network development must be understood and managed to provide benefits to new ventures is extremely rare (Hoang & Antoncic, 2003). Consequently, neither the variation in new ventures' networks characteristics nor the consequences of this variation are currently well understood. As a result, researchers are encouraged to further study network development as an independent variable while integrating new venture performance as a dependent variable (Slotte-Kock & Coviello, 2010). Moreover, there is a need to further examine how different approaches in exchange network development influence entrepreneurial outcomes (Ozcan & Eisenhardt, 2009). Finally, as most quantitative studies analyzing network development processes focus on network size as a proxy for network development, clear empirical insights are still laking regarding 'real' network development in terms of its "two evolutionary primitives—the creation and dissolution of ties" (Koka, Madhavan, & Prescott, 2006, p. 721).

Chapters four, five and six address these issues. The study presented in Chapter four analyzes the comparative performance effects associated with two different types of new ventures' exchange relationships: identity based ties, which are based on

relationships that already existed before the new venture was founded, and calculative ties, which were developed after the new venture was established. The study empirically addresses the conceptual framework of Hite and Hesterly (2001), thus contributing to our understanding of the relevance of network development processes to new venture performance.

The studies presented in Chapters five and six address continuous network development processes based on a longitudinal dataset. The study presented in Chapter five focuses on the performance implications of different ways in which new ventures can develop their exchange network over time. The proposition is that both exploration in network development (conceived as the formation of new exchange relationships) as well as exploitation in network development (conceived as a reliance on existing exchange relationships) positively influence new ventures' performance, yet for different reasons. In addition, the study examines performance effects of the ambidextrous engagement in both activities. Chapter six presents a study that extends the findings of those presented in Chapter five. Specifically, the study comparatively analyzes two different strategies of realizing ambidexterity in network development. In particular, the study examines how contextually or temporally balancing exploration and exploitation in exchange network development affects new venture performance. Moreover, the moderating effect of environmental and network conditions as well as characteristics of the new venture is hypothesized and tested.

The findings of both studies thus extend the literature on the performance implications of new ventures' continuous network development by studying the outcomes of different network development activities and strategies over time.

It is important to note that the studies in this thesis rely on different measures for new venture performance. While the studies in Chapters two, three, and four define new venture performance in terms of revenue, revenue growth, and profit growth, the studies presented in Chapters five and six employ profitability as proxy for new venture performance.

Revenue measures are widely considered to be powerful indicators for new venture performance.

Form a theoretical point of view, there is considerable agreement about the appropriateness of revenue figures as performance measures. As already indicated above, different studies conclude that generating a certain level as well as a certain growth rate of revenue is a major issue in the process of new venture development (Baron & Markman, 2003; Baum et al., 2000; Lechner et al., 2006). Additionally, it has been argued that even in comparison to more sophisticated measures, revenue is appropriate to apply, because very successful ventures often incur losses in early

stages of their development while gaining high revenue. In this manner, Brüderl and Preisendorfer (1998) found in an impressive large-scale study that revenue figures discriminate between more successful and less successful ventures in terms of survival.

Additionally, different studies have underscored the validity and reliability of revenue measures. Examining different options to measure new venture performance Chandler and Hanks (1993) found that even self-reported revenue as well as revenue growth figures are of high external reliability and validity. Additionally, Brush and Vanderwerf (1992) demonstrate that revenue figures obtained from archival data and direct questioning of founders are highly correlated.

Likewise, yet far less criticized, profitability has been shown to be a legitimate measure for new venture performance (see e.g. Sandberg & Hofer, 1987).

However, the diversity of measures in my studies is due to the fact that the publicly available dataset of the latter two studies (PSED II) does not contain additional financial data other than the profitability as such (Reynolds, 2011).

Furthermore, I would like to acknowledge the following: all the samples in the following studies rely on new ventures from various industries. However, while the studies presented in chapter two through four exclusively contain new ventures that have been founded independently, the studies presented in Chapters five and six also contain new ventures that have been founded on behalf of an employer. Again, this divergence is due to the conception of the PSED II dataset, as it contains a high share of dependently founded ventures. As a result, excluding them would have caused a significant decrease in the number of observations and thus of statistical power. Therefore, we included them and addressed this issue by controlling for the dependence/independence of the ventures when analyzing the PSED II data. However, even though slightly inconsistent with regard to this thesis, both approaches have been shown to be legitimate when studying new ventures (Parker, 2011; Vanderwerf & Brush, 1989).

Chapter 2

Networking Ability and the Financial Performance of New Ventures: A Mediation Analysis among Younger and More-Mature Firms

2.1. Introduction

One of the important questions that entrepreneurship research tries to answer, is why some entrepreneurs are more successful than others in founding and developing their new ventures (Amit, Glosten, & Muller, 1993; Markman & Baron, 2003; Shane & Venkataraman, 2000). Several of the factors identified as being relevant for answering that question, such as personality traits, skills, and prior experiences are directly linked to the entrepreneurs themselves (see, for example, Baum & Locke, 2004; Frank et al., 2007). In contrast to the considerable knowledge generated on the relevance of person-related factors, however, our understanding of the processes and mechanisms through which these micro-level characteristics influence relevant macro-level measures, such as new venture performance, is still limited (Baron, 2007; Rauch & Frese, 2007; Zhao, Seibert, & Lumpkin, 2010).

Another factor increasingly perceived as a key element in the discussion on entrepreneurs' success is the network in which the new venture is embedded. Specifically, prior research has provided considerable evidence for the notion that certain characteristics of the new ventures' network, such as its size and the quality of network relationships, may impact the success of a new venture (Hoang & Antoncic, 2003; Jack, 2010; Street & Cameron, 2007). In addressing the relevance of networks in different stages of the new venture creation and development process, however, research has so far almost exclusively treated their characteristics as exogenous variables (Stuart & Sorenson, 2007). As a consequence, neither the variation in new ventures' networks characteristics nor the antecedents of this variation are well understood so far (Rosenkopf & Schilling, 2007; Stuart & Sorenson, 2007).

In order to shed more light on the micro-macro link in the field of entrepreneurship and to contribute to closing the aforementioned gaps in the literature, the present study connects the person-related and the network-focused streams of research. Specifically, we develop and test the hypotheses that entrepreneurs' networking ability—an individual's skill to easily develop friendships and coalitions by means of understanding power structures and the force of one's typically subtle

style (Blass, Brouer, Perrewé, & Ferris, 2007; Ferris et al., 2005)—plays a significant role for new ventures' financial performance, because it enables the development of a new venture's network with more and stronger exchange relationships. In addition, we develop and test hypotheses about a moderating effect of venture age on the relationships between entrepreneurs' networking ability, new ventures' network characteristics, and their financial performance.

Based on structural equation modeling (SEM) and a sample of 146 entrepreneurs and their new ventures in Germany, our results provide broad support for our hypotheses. In particular, we find a significant relationship between entrepreneurs' networking abilities and new ventures' financial performance that is mediated by the size of the new venture's network and the strength of network relationships among younger ventures, but not among more mature ones.

In view of these findings, we think that our study contributes to enhancing the breadth and accuracy of current models of entrepreneurs' success. In providing evidence for how entrepreneurs' networking ability may influence new ventures' financial performance by enabling them to shape parts of their social environments according to their new venture's needs, our study first of all contributes to answering the under-investigated key question of how individual-level skills may impact macro-level variables in the field (Baron, 2007; Rauch & Frese, 2007; Zhao et al., 2010). At the same time, our study also contributes to network research in entrepreneurship by pointing to entrepreneurs' networking skills as one of the cognitive and behavioral foundations of new ventures' networks, which have so far been widely neglected by empirical research (Baron, 2007; O'Donnell, Gilmore, Cummins, & Carson, 2001). Finally, we think that our results on the moderating effect of venture age, which complement and extend previous findings, contribute to answering questions about (a) the conditions affecting the relevance of entrepreneurs' personal characteristics (Rauch & Frese, 2007), as well as about (b) the potential contingencies influencing the relationship between network characteristics and new ventures' performance (Hoang & Antoncic, 2003).

The rest of the paper is organized as follows: in the next section, we develop our hypotheses. We then describe our research method, present the results of our analysis, and then discuss them.

2.2. Theory and Hypotheses

Numerous studies demonstrate that variables related to the entrepreneur as a person are relevant for predicting the performance of their new ventures. Among the variables identified are personality characteristics, such as extraversion and emotional

stability (Zhao et al., 2010), locus of control (Hansemark, 2003), need for achievement (Rauch & Frese, 2007), optimism (Hmieleski & Baron, 2009), and entrepreneurial passion (Baum & Locke, 2004); variables related to entrepreneurs' experiences, such as general human capital (Davidsson & Honig, 2003; Diochon, Menzies, & Gasse, 2008), experience in the industry of the new firm (Colombo & Grilli, 2005), and prior entrepreneurial experience (Colombo & Grilli, 2005); as well as certain socio-demographic variables like age (Lévesque & Minniti, 2006), gender (Brush, 1992; Langowitz & Minniti, 2007; Minniti, 2010), and migrant background (Baycan-Levent & Kundak, 2009; 2007). Additionally, recent research provides confirming evidence for a link between the social skills of entrepreneurs and their success in running and developing a new venture. In particular, Baron and Markman (2003) and Baron and Tang (2009) have shown that entrepreneurs' social skills are significantly related to the financial performance of their new ventures.

Despite this compelling evidence for the relevance of person-related factors, the value of the person-related stream of research in entrepreneurship has frequently been questioned (Frank et al., 2007; Mitchell et al., 2002; Rauch & Frese, 2007 p. 353). A major critique is that there are few studies to date that conceptualize and at the same time empirically address the processes and mechanisms explaining how person-related factors may exert their influence on the performance of new ventures, and an even greater dearth of research addressing the complex interplay of entrepreneurs' characteristics and organizational as well as environmental variables (Baron, 2007; Korunka, Frank, Lueger, & Mugler, 2003; Rauch & Frese, 2007). To help close this gap in research, we develop and later test hypotheses on how and under which conditions entrepreneurs' networking ability—an individual skill—affects the financial performance of new ventures—a macro-level variable.

2.2.1. Networking Ability and a New Venture's Financial Performance

As noted above, networking ability describes an individual's skill to easily develop friendships and coalitions by means of understanding power structures and the force of one's typically subtle style (Blass et al., 2007; Ferris et al., 2005). It is considered to be 'the core' (Blass et al., 2007: 93) or the 'most important [dimension]' (Todd, Harris, Harris, & Wheeler, 2009: 287) of the political skill concept.

Similar to social skills, political skills have their roots in the concept of interpersonal intelligence (Hochwarter et al., 2007). According to theorists, however, there is also a significant difference between the two concepts. Whereas social skills are considered to be 'general skills affecting social interactions in a broad array of everyday contexts' (Ahearn, Ferris, Hochwarter, Douglas, & Ammeter, 2004: 312) and defined as 'skills useful to individuals in interacting with others' (Baron & Tang,

2009: 282), political skills are conceptualized as being more strictly 'work-related' (Kolodinsky, Treadway, & Ferris, 2007: 1748) and more 'instrumental' (Hochwarter et al., 2007: 229) or 'goal-oriented' (Ferris et al., 2008: 750). Correspondingly, political skills are defined as the ability to 'influence others to act in ways that enhance one's personal or organizational objectives' (Todd et al., 2009: 180), and people with distinct networking abilities are considered to be good at using the social influence strategies and tactics necessary to develop, maintain, and mobilize powerful alliances and coalitions in order to achieve their personal objectives (Ferris et al., 2005; Hochwarter et al., 2007; Peled, 2000). As an important dimension of the political skills concept, networking ability has empirically not only been found to positively influence job performance (Semadar, Robins, & Ferris, 2006) and income (Ferris et al., 2008; Wolff & Moser, 2009), but has also been observed to have significant incremental validity in predicting career outcomes over several other social-effectiveness constructs (Semadar et al., 2006; Todd et al., 2009).

Based on these observations, we expect an individual's networking ability to not only have a positive impact in the context of larger organizations but also in an entrepreneurial one. Specifically, we expect that the financial performance of new ventures will be positively influenced by entrepreneurs' networking abilities. For the development of a newly established business, many different tasks have to be accomplished and diverse tangible and intangible assets such as financial capital, legal and market knowledge, and many others are needed (Ensley, Pearson, & Amason, 2002; Singh, Tucker, & House, 1986). Since not all of the resources needed are typically available within a new venture in sufficient quality or quantity, it is widely recognized that external resource support is needed for successfully developing a new firm (Jarillo, 1989; Larson, 1992). Additionally, researchers have observed that, even when the venture grows, entrepreneurs are the ones primarily responsible for securing access to the external resources needed by means of dealing with external partners (Dieleman & Boddewyn, 2012; Starr & Macmillan, 1990).

In view of these findings and the fact that networking ability is considered to be a key skill in building and using relationships and coalitions to achieve one's personal objectives (Blass et al., 2007; Ferris et al., 2008), we expect the networking ability of entrepreneurs to have a significant impact on the financial performance of their new ventures. Consequently, we propose:

H1. *Entrepreneurs' networking ability has a positive impact on the financial performance of their new ventures.*

2.2.2. Characteristics of a New Ventures' Network as a Mediator

In general, there are several possibilities for how entrepreneurs' ability to build and use stronger bonds and coalitions may positively impact the performance of a new venture. First, it could help entrepreneurs to form an effective founding team. Second, a high level of networking ability could enable entrepreneurs to acquire customers. Third, it could help entrepreneurs to establish an external, firm-level network of exchange relationships that may contribute to their new ventures' success.

In the present paper, we focus on the last of these potential explanations and analyze in more detail how entrepreneurs' networking ability may impact the financial performance of their new ventures by potentially affecting the characteristics of their new ventures' networks. We do so for two reasons: First, a still-growing body of research in the field of entrepreneurship suggests that a new venture's network—defined as the set of a new venture's exchange relationships that goes beyond simple market exchange (Hite & Hesterly, 2001; Lee et al., 2001)—is crucial for success in founding and developing a new business (see, for example, Elfring & Hulsink, 2007; Street & Cameron, 2007). Second, Batjargal (2010b) has provided some initial evidence for a link between entrepreneurs' networking ability and new ventures' networks by showing that entrepreneurs skilled in networking are able to attract a greater number of institutional investors than their less-skilled counterparts.

Based on these previous findings, we subsequently develop detailed hypotheses on how the potential influence of entrepreneurs' networking abilities on a new venture's financial performance may be mediated by (a) the size of the new venture's network, and (b) the strength of the new venture's network relationships. We focus on these two network variables for several reasons: First of all, network size and relationship intensity are two variables that prominently represent the relational and the structural camp into which network research in entrepreneurship may be broadly divided (see, for example, Granovetter, 1992; Hoang & Antoncic, 2003; Jack, 2010; O'Donnell et al., 2001). Secondly, a growing number of studies indicate that these two particular variables contribute significantly to explaining new ventures' performance when addressing active firm-level exchange relationships (see, for example, Baum et al., 2000; Raz & Gloor, 2007). Finally, addressing these two network variables seems to be especially fruitful in the study at hand, since Ferris et al. (2005: 129) claim that individuals with a distinct networking ability are especially good at building 'strong, beneficial alliances and coalitions'.

2.2.2.1. New Ventures' Network Size as a Mediator

As noted above, we focus on the new ventures' network, defined as the set of exchange relationships of the firm that go beyond simple market exchange (Hite &

Hesterly, 2001; Lee et al., 2001; Oczan & Eisenhardt, 2009). As a still-growing body of research in the field of entrepreneurship suggests, such network relationships are important for developing a new business (Elfring & Hulsink, 2007; Street & Cameron, 2007). Specifically, research indicates that such relationships are beneficial for entrepreneurs because they provide access to tangible and intangible resources, such as relevant information, expertise, complementary physical assets, and even financial capital at favorable terms (Batjargal, 2003; Batjargal & Liu, 2004; Baum et al., 2000; Liao & Welsch, 2005). In particular, network relationships are expected to provide these resources at much better exchange terms than traditional market exchanges on the one hand and enable entrepreneurs to avoid the capital investments and bureaucratic inefficiencies that come with vertical integration on the other (Hite & Hesterly, 2001; Larson, 1992).

The size of a new venture's network refers to a structural level of analysis and focuses on the extent of existing network relationships (Adler & Kwon, 2002; Burt, 1992; Seibert, Kraimer, & Liden, 2001). In general, the expectation that exchange network size has a positive impact on new venture performance is based on the fact that larger networks are made up of more network partners who in sum may provide more resources at favorable terms (Lee & Tsang, 2001). Moreover, a larger network is also expected to increase the variety of resources available, making it more likely that new ventures will be provided with the resources needed (Batjargal, 2003). In line with this reasoning, we thus expect the size of a venture's network to positively influence its financial performance (Hansen, Podolny, & Pfeffer, 2001; Liao & Welsch, 2003).

Even though the new venture's network refers to a different level of analysis than the entrepreneurs' individual networking abilities, we suppose that a potential impact of entrepreneurs' networking skills on new venture performance may—at least partially—be explained by the size of a new venture's network. In general, new ventures typically lack a history of prior partnerships and might be unable to reciprocate directly due to resource constraints (Milanov & Fernhaber, 2009). Consequently, we expect that entrepreneurs trying to establish exchange relationships for their new ventures will have to cope with potential exchange partners' reservations to cooperate; and additionally believe that entrepreneurs with a distinct networking ability are better able to deal with potential exchange partners' reluctance.

As already indicated above, individuals with strong networking abilities are highly skilled negotiators and deal makers and are good at using social influence strategies and tactics (Ferris et al., 2008). Gifted with the power of a characteristically subtle style and the ability to transmit signals conducive to a favorable image, which results in higher assessments of reputation (Ferris et al., 2005; Liu et al., 2007), we

expect them to be better able to overcome potential partners' reluctance and convince them to cooperate. Consequently, we expect entrepreneurs more highly skilled in networking to be able to establish more network exchange relationships for their new businesses than their less-skilled counterparts. In turn, these network relationships should widen the breadth of resources available to the new ventures, and as a result foster their firm's financial performance. We therefore propose:

H2a. *The effect of entrepreneurs' networking ability on the financial performance of their new ventures is partially mediated by the size of the new ventures' exchange networks.*

2.2.2.2. The Strength of New Venture's Network Relationships as a Mediator

Besides the size of a new venture's exchange network, we also expect the strength of network relationships to partially explain how entrepreneurs' networking abilities influence their new venture's financial performance. Stronger network relationships involve a higher frequency of interaction as well as an emotionally closer relationship between network partners (Granovetter, 1982). Because of these very characteristics, stronger ties are expected to be beneficial for getting access to needed resources. First, the feelings of affection that come with a stronger connection motivate exchange partners to be more helpful and support one another by granting access to their resources at more favorable terms (Krackhardt, 1992; McFadyen & Cannella Jr, 2004; Steier & Greenwood, 2000). Second, a stronger network relationship is expected to make resource exchange more efficient. Through repeated interactions, exchange partners develop similar knowledge stocks and cooperative routines that ameliorate resource exchange (McFadyen & Cannella Jr, 2004; Uzzi, 1997). As a result, obtaining resources that network partners may be able to provide should be significantly easier and less costly when new ventures' network relationships are stronger.

As we have described above, however, developing exchange relationships for a new venture is usually not easy, since young firms typically lack a history of cooperation and are often unable to reciprocate directly. Consequently, we expect developing exchange relationships that are characterized by an intense level of cooperation to be even more of a challenge. Based on this reasoning, and the fact that entrepreneurs with distinct networking abilities are considered to be especially good at building strong, beneficial, and contextually appropriate network relationships (Ferris et al., 2005; Todd et al., 2009), we believe that entrepreneurs' networking abilities may be essential for developing stronger exchange relationships for their new

ventures, which in turn foster new ventures' financial performance. Consequently, we propose:

H2b. *The effect of entrepreneurs' networking ability on the financial performance of their new ventures is mediated by the strength of the new venture's network exchange relationships.*

2.2.3. Moderating Effect(s) of Venture Age

Above, we have argued that network exchange relationships are crucial for new ventures because they provide necessary resources at favorable terms. Additionally, we have suggested that entrepreneurs' networking abilities may be a key to developing the new venture's exchange network, since potential network partners may hesitate to cooperate because of a new venture's resource constraints and a lack of history in prior partnerships. We now outline in detail why we expect these two effects to be moderated by venture age.

It has been widely recognized that younger ventures in particular are exposed to a liability of newness, meaning that they have a higher failure rate than their older counterparts (Aldrich & Auster, 1986; Freeman, Carroll, & Hannan, 1983; Wiklund, Baker, & Shepherd, 2010). Members of a recently founded venture have to learn and develop new roles, and establish a common normative basis and informal structures to develop effective and efficient modes of interaction (Brüderl & Schüssler, 1990). As long as such working routines are not fully established, day-to-day operations are not very effective, meaning that the resources available to young ventures are often not used efficiently (Wiklund et al., 2010). Resource availability, however, is especially critical for younger ventures that are typically more resource poor than more-mature ones (Jarillo, 1989; Larson, 1992). As delineated above, a widely recognized measure to counteract resource scarcity is establishing network exchange relationships that provide access to needed resources, such as financial capital or information and knowledge that help to build up the internal working routines needed for efficient operation (Baum & Oliver, 1991; Larson, 1992).

Combining these arguments, we expect younger ventures, which have a greater need for external resources than more mature ones, to particularly profit from developing greater and more-intense network exchange relationships. Accordingly, we believe that the financial performance of younger ventures is to a much larger extent determined by the size of their exchange network and the strength of those exchange relationships. We thus hypothesize:

H3a. *The positive effect of the size of a new venture's network on its financial performance is stronger for younger than for more-mature businesses.*

H3b. *The positive effect of the strength of a new venture's network relationships on its financial performance is stronger for younger businesses than for more-mature ones.*

Analogously, we also expect younger ventures' success in developing larger exchange networks with stronger network relationships to depend more extensively on their entrepreneurs' networking skills. Whereas more mature ventures may rely on a track record of performance and cooperation that signals legitimacy when trying to develop network relationships, younger ventures lack these opportunities (Milanov & Fernhaber, 2009; Zimmerman & Zeitz, 2002). Additionally, younger ventures are more likely unable to directly reciprocate in resource exchanges, since they face more severe resource constraints than do more mature businesses (Milanov & Fernhaber, 2009).

In view of these arguments, we believe that younger ventures in particular will have to rely on other assets to when trying to establish and intensify cooperative exchange relationships and expect founders' individual networking ability to be such an asset. Consequently, we expect that entrepreneurs' networking skills are more relevant for recently founded new ventures than for their more-mature counterparts when it comes to establishing larger exchange networks with more intense relationships. We thus propose:

H3c*. The positive impact of entrepreneurs' networking ability on the size of a new venture's network is stronger for younger firms than for more-mature ones.*

H3d*. The positive impact of entrepreneurs' networking ability on the strength of network relationships is stronger for younger firms than for more-mature ones.*

2.3. Method

To obtain a broad sample of newly founded ventures for our study, we asked institutions organizing business plan competitions and coordinating startup funds to grant us access to their alumni. Because of confidentiality issues, they refused to provide us with contact information but offered to invite their alumni to take part in our research. We developed an online questionnaire accessible with username and password that our partner institutions sent directly to their alumni. A total of 575

founders accessed and 221 finished our questionnaire, yielding a rate of completed responses of 38.4 percent.

We then selected our sample population according to criteria commonly used in entrepreneurship research (Vanderwerf & Brush, 1989). Specifically, we only included independent businesses—that is, no subsidiaries of parent corporations. Second, we restricted our sample with respect to company age. Consistent with other studies in the field (Covin, Slevin, & Covin, 1990; Hansen, 1995; Lechner et al., 2006; Sorenson et al., 2008), we excluded all firms less than one year old and companies established more than ten years ago. We then had to exclude additional data sets because of missing values, leaving 146 usable responses.

This data-collection approach admittedly has its disadvantages. First, response bias may have been an issue. Consequently, we conducted two checks: we grouped respondents by arrival date and compared early respondents to late ones with respect to several of our independent and dependent variables. Additionally, we checked for nonresponse bias to the extent that anonymous respondents more closely resemble nonrespondents (BarNir & Smith, 2002). In both comparisons, no significant differences were found.

Additionally, our data-collection approach definitely resulted in a convenience sample, which may raise issues of representativeness. To deal with this concern, we compared our sample to data from the German Socio-Economic Panel (SOEP). The SOEP is a representative household panel survey conducted annually by the German Institute for Economic Research in Berlin and is often used for representative research on German entrepreneurs (Caliendo, Fossen, & Kritikos, 2009; Mueller, 2006; Schäfer & Talavera, 2009). We found a high degree of similarity between the entrepreneurs within our sample and the self-employed individuals within the SOEP. The small percentage of female founders (32 percent) within our sample, for example, matches well with the 31 percent of female entrepreneurs within the SOEP (Caliendo et al., 2009). Moreover, the observation that self-employed Germans are well-educated is also reflected in our data. Also, considering that our data collection lead to a sample in which firms operating in many different industries, such as life sciences, information technology, chemical products, construction, food, and education are represented, we think that our sample might be fairly representative for German entrepreneurs and their new ventures.

We also checked whether our sample is biased with respect to new-venture performance. To do so, we compared the average revenue growth rates reported by our respondents with the respective industry averages, which we obtained from the German Federal Statistical Office. The comparison revealed that across industries, 39 percent of our respondents reported a growth rate at the same level or even below the

industry standard. Given that growth rates of younger ventures are expected to be higher than the industry standard on average (Chandler & Hanks, 1993), we believe that our sample is not seriously biased in terms of performance.

2.3.1. Measures

Since there were no objective data available to represent the main exploratory and dependent variables in our study, we relied on self-reported measures. We are confident that this approach led to results with reasonable validity. First, most of our variables are concrete and will therefore be perceived and reported more accurately than will psychometric properties (Fuchs & Diamantopoulus, 2009). Second, previous research in entrepreneurship gives broad support for the reliability and validity of self-reported measures (Brush & Vanderwerf, 1992; Lechner et al., 2006; Peng & Luo, 2000). Recognizing that several authors advocate a different position (Boyd, Gove, & Hitt, 2005; Podsakoff, MacKenzie, Jeong-Yeon, & Podsakoff, 2003; Podsakoff & Organ, 1986), however, we took several additional steps to ensure the validity of our data. We describe these steps in more detail after introducing our measures.

2.3.1.1. New Venture's Financial Performance

To capture new-venture financial performance, we used three items that have been shown to be reliable and valid in prior research (Chandler & Hanks, 1993, 1998; Honig, Lerner, & Raban, 2006; Lee & Tsang, 2001). Specifically, we asked our respondents to indicate the current revenue, as well as the revenue growth rates and profit growth rates of their new ventures, in broad categories. We chose this scale format because it is considered helpful to overcome problems caused by unwillingness to disclose detailed financial information and also helps to address the problem that even when business owners are willing to share financial performance data, the accuracy of their figures cannot be taken for granted (Zahra, Neubaum, & El-Hagrassey, 2002).

For revenue, the response categories ranged from 1–'up to €50,000' to 9–'more than €10,000,000'. Growth rates were grouped in seven brackets ranging from 1–'less than 5 percent' up to 7–'more than 200 percent', and had to be indicated for a three-year period (or in comparison to their first 12 months of operation if the venture was younger than three years). We then divided these cumulative growth rates by three (or company age if the company was younger than three years) to obtain comparable average growth rates. Because revenue growth and profit growth turned out to be highly interrelated ($r = 0.81$, $p < 0.001$), but only modestly related to revenue ($r = 0.23$, $p < 0.01$ and $r = 0.26$, $p < 0.01$ respectively), we decided to include revenue and

growth as two separate variables in our further analysis. To correct for skewness, we constructed the natural log of all three items.

2.3.1.2. Network Variables

As described in our theory section, we focused on the new venture's exchange network and thus followed an ego-centered network approach (Knoke & Yang, 2008; Wassermann & Faust, 1994) at the firm-level. To capture new ventures' network size, we asked our respondents for the number of active exchange relationships between their new venture and external individuals or organizations that go beyond a simple market exchange. To further refine this question, we asked for three different categories of relationships. Specifically, we asked for the number of network exchange relationships that provide access to (1) financial capital; (2) physical resources, such as facilities, equipment, or manpower; and (3) knowledge and information. We then added the three item scores to get a measure for the total network size.

To capture the strength of exchange relationships, we adapted two items used in prior research (Hansen, Mors, & Lövas, 2005; Kale, Singh, & Perlmutter, 2000) and asked our respondents to indicate on a seven-point scale (1) how frequently members of their new ventures interact with network partners, and (2) the extent to which there is a close, personal relationship between new ventures' members and these network partners. As expected, both items turned out to be highly positively correlated ($r = 0.73$, $p < 0.001$)

2.3.1.3. Networking Ability

To capture entrepreneurs' networking ability, we adapted three items from the networking ability scale that is included in the Political Skill Inventory (Ferris et al., 2005; Ferris et al., 2007). Specifically, we asked our respondents to indicate on a seven-point scale to what extent the entrepreneurs who liaise with network partners (1) have always spent substantial time and effort networking with others, (2) have always been good at building relationships with influential people, and (3) have always been good at using their connections and network to make things happen, even before they founded their new venture. We chose to use these three items for parsimony reasons and because they cover all three different facets of the networking ability scale—spending time on networking, building useful relationships, and using connections to make things happen—which are usually captured with two items each. With a Cronbach's alpha of .86, the resulting measure turned out to be as reliable as

the complete networking ability scale, for which a Cronbach's alpha of .87 is commonly reported (Blass et al., 2007; Ferris et al., 2005).

2.3.1.4. Venture Age

To capture venture age, we asked our respondents to indicate for how many years the venture has been operating. Since company age typically corresponds to a firm's resource base and influences its revenue potential (Stam & Elfring, 2008), we not only used this variable when testing our moderation hypotheses, but also included it as a control in our models.

2.3.1.5. Controls

We included several additional control variables. First, we controlled for the current number of employees and employment growth to address the fact that developing competencies within a new venture by means of hiring employees may, at least to some extent, substitute for relying on network exchange relationships (Colombo et al., 2006; Larson, 1992; Oliver, 1990). For similar reasons, and because the number of founding team members may also influence the number of network exchange relationships that can be developed and managed (Batjargal, 2006), we also included this variable as a control. Rosenkopf and Schilling (2007) as well as Schutjens and Stam (2003) demonstrate that network structures may vary substantially across industries that differ in terms of technological dynamism and uncertainty. Accordingly, we included a dummy variable to indicate whether a firm belongs to a high-tech industry. Additionally, we sequentially controlled for effects of the different industries such as life sciences, information technology, chemical products, construction, food, education, and clothing.

2.3.2. Data and Construct Validity

As mentioned above, we took several additional steps to ensure the validity of our data. Recognizing that our measures are self-reported, we first checked for common method bias. By Harman's one-factor test, five distinct factors were extracted, accounting for 74 percent of the total variance. While the first factor explained 20 percent of the variance, no one factor accounted for most of it. Because Harman's single factor test provides only a coarse indication for common method bias, we also followed the recommendation of Podsakoff et al. (2003) and tested for a latent method factor by means of confirmatory factor analyses. Specifically, we constructed (a) a method model, in which all items load on a common method factor; (b) a theoretical model, in which the items were assigned to respective latent variables according to

theory; and (c) a full model, in which all items loaded on their latent variables as well as an additional method factor. Given that all three models are only defined for variables with more than one indicator, our analysis comprised the items capturing networking ability, tie strength, and growth in financial performance. Comparing the models by means of chi-square difference test (Bagozzi, Youjae, & Phillips, 1991), we found that neither the method model nor the full model provided a significantly better fit with our data than the theoretical model. Consequently, we are confident that common method bias is not an issue in our study.

We further tested the validity of our data by comparing self-reports with external sources of information for those companies that identified themselves in the data collection process. The correlations between the self-reported measures and data on firm age, the number of employees, and the number of founding team members available on the internet were all highly significant and ranged from 0.97 ($p < 0.01$, $N = 41$) for company age to 0.98 ($p < 0.01$, $N = 49$) for the number of founding team members.

Since prior research has shown a high correspondence of self-ratings and other-ratings on networking ability in an intra-organizational context (Ferris et al., 2008), we are quite confident that the measure we used is valid. Considering that we are the first ones to use these items in an entrepreneurial context, however, we also tried to further ensure the validity of this measure. Specifically, we asked those entrepreneurs who contacted us after participating in our study to provide us with the contact details of a person outside their company who is acquainted with the founding team members that deal with external partners and whom we could interview. We then contacted the 18 people whose contact details we received and asked them to rate the networking ability of those entrepreneurs dealing with the new venture's network members. Ranging from 0.84 ($p < 0.01$) to 0.94 ($p < 0.01$), these other-ratings turned out to be highly correlated to the self-ratings provided by the entrepreneurs in our data set.

To ensure the validity of our financial performance measures, we tried to follow Batjargal's (2010a) approach and validate our new ventures' financial performance data with taxation department officials. Pointing to the legal requirement to keep tax information strictly confidential, however, the German officials refused our request. We thus tried a different approach. In Germany small firms have to be listed with the local chamber of commerce and in the commercial register when they meet certain criteria (Brüderl et al., 1992; Brüderl & Schüssler, 1990). Service companies have to be listed if they realize revenues of at least €75,000, and producing companies if they realize revenues of at least €150,000. Making use of these criteria, we split our subsample of those ventures that we could identify into two subsets, and checked whether the ventures from both subgroups were listed or not. The result of

this search showed that every company that should be listed according to the self-reported revenue data was indeed listed and vice versa. Additionally, we searched three different German firm databases—Hoppenstedt, Dafne and Creditreform—for more detailed financial performance data on the firms in our sample. As a result, we were able to compare the revenue data provided by 18 of our respondents with database entries and found the data to be highly correlated ($r = 0.95$; $p < 0.01$). In sum, we are thus confident that the financial performance data used in our study are of considerable validity.

2.3.3. Analytical Approach

We tested our hypotheses using structural equation modeling (SEM). We chose SEM because it offers two advantages: First, it allows for simultaneously testing interrelated hypotheses (Byrne, 2009; Schumacker & Lomax, 2004), which seems crucial for our study since its aim is to test the interplay of relationships between one independent, two mediating, one moderating, and two outcome variables. Additionally, SEM provides the opportunity to include latent variables so that we could take the measurement error for our latent variables—networking ability, tie strength, and revenue growth—into account when statistically analyzing the data.

To test our hypotheses, we developed four different models: (1) a direct model, which includes the direct paths of networking ability on revenue and financial performance growth; (2) a full model, in which the direct paths of networking ability on revenue and financial performance growth, as well as the proposed indirect paths mediated by network size and tie strength, are included; (3) a mediation model, which includes only the proposed indirect paths; and (4) a null model, in which no relationships are posited. After checking for the global fit of these models, we then applied the nested model test described by Yli-Renko, Autio and Sapienza (2001) to get a first impression of whether our mediation hypothesis might hold true. Afterwards, we tested for Hypotheses 1, 2a, and 2b step-by-step, by means of examining the constellation of path coefficients in and across our models.

Finally, to test for our moderation hypotheses (Hypotheses 3a, 3b, 3c, and 3d), we followed the recommendation of Wegener and Fabrigar (2000), Rigdon and Schuhmacker (1998), and the example provided by Simonin (1999) and used a multiple-group model. Even though we recognize that this approach comes with the disadvantage of lower statistical power, it seems appropriate for our study because it avoids multicollinearity and distributional problems that may occur when testing a complex model with multiple interaction effects by including interaction terms (Rigdon et al., 1998; Wegener & Fabrigar, 2000).

2.4. Results

For consideration, means, standard deviations, and correlations for our variables are shown in Table 2.1.

To assess the global fit of our SEM models, we relied on two global-fit criteria: the chi-square test, which is the only real statistical test of significance for structural equation models (Schumacker & Lomax, 2004), and the root mean square error of approximation (RMSEA), which has recently been recognized as one of the most informative standards in covariance structure modeling (Byrne, 2009). According to these two global-fit measures—for which estimates are presented in Table 2.2—the direct as well as the full and the mediation model fit the empirical data well. The normed chi-square values of all three models are close to the recommended value of 2.0 (Hair, Anderson, Tatham, & Black, 1995). With values close to 0.08, the RMSEA estimates also suggest that the fit of all three models is at least reasonable (Byrne, 2009).

As also depicted in Table 2.2, we additionally checked for the comparative fit index (CFI) values of our models and found them to be close to the recommended value of 0.90 (Bentler, 1990; Bentler, 1992; Hair, Black, Babin, Anderson, & Tatham, 2006; Marsh, Balla, & Hau, 1996).

Table 2.1. Means, Standard Deviations, and Correlations

N = 146		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1	Networking ability	1									
2	Network size	0.22*	1								
3	Tie strength	0.35*	0.34*	1							
4	Revenue (in T€)	0.17*	0.21*	0.11	1						
5	Growth (in % per year)	0.03	0.15	0.15	0.26*	1					
6	Venture age	-0.14	0.01	0.04	0.37*	-0.07	1				
7	Number of founders	0.27*	0.07	0.05	0.31*	0.08	-0.10	1			
8	High-tech industry (Dummy)	0.05	-0.16	0.09	0.09	0.03	0.12	0.08	1		
9	Number of employees	0.01	0.06	-0.02	0.59*	0.10	0.16	0.44*	0.01	1	
10	Employment growth	-0.01	0.04	-0.02	0.47*	0.17	0.08	0.45*	0.05	0.88*	1
	Means	3.71	4.50	3.55	424.74	42.20	4.08	1.84	0.58	4.85	2.94
	S.D.	1.70	5.77	2.02	8.43	62.97	2.66	1.07	0.49	17.36	0.93

* $p < 0.05$; two-tailed test; for latent variables correlations with factor scores are reported

Table 2.2. Model Statistics—Full Sample Estimation

Model	**Chi²**	**d.f.**	**p**	**Normed chi²**	**RMSEA**	**CFI**
1. Direct effects model (1)	168.99	73	0.00	2.32	0.09	0.85
2. Full model (2)	143.17	38	0.00	2.14	0.09	0.88
3. Mediation model (3)	143.4	42	0.00	2.08	0.08	0.89
4. Null model (4)	746.73	105	0.00	7.11	0.21	0.00

2.4.1. Nested-Model Test

To test for differences in statistical significance between the direct, mediation, and full models, we first analyzed whether the chi-square values of the three models vary significantly (Steiger, Shapiro, & Brown, 1985). The results of the sequential chi-square difference tests are shown in Table 2.3.

Table 2.3. Nested Model Tests—Full Sample Estimation

Comparison		Chi² diff.	d.f. diff.	P	Model Preference
Model 2 vs. 4	Full vs. null	603.32	38	0.00	2
Model 2 vs. 1	Full vs. direct	25.82	6	0.00	2
Model 2 vs. 3	Full vs. mediation	0.23	2	0.89	3

A significant difference in the chi-square value indicates that a more complex model—that is, a model with fewer degrees of freedom—yields a better fit with the data (Bagozzi et al., 1991; Yli-Renko et al., 2001). Accordingly, the chi-square difference comparison between the full and null models suggests that the first provides a far better fit. A comparison between the full and the direct model suggests that the full model has a significantly better fit with our data ($p < 0.001$). Finally, when comparing our full model with the mediation model, it becomes clear that the mediation model is superior, as the explanatory power of the two models does not differ significantly ($p = 0.89$) and the mediation model is the more parsimonious one. The nested-model test thus provides initial evidence for our proposition that the relationship between networking ability and a new venture's financial performance may indeed be best described by a mediation model. In order to test our hypotheses, we then analyzed the path coefficients in and across our models.

2.4.2. Path Coefficient Analysis

As depicted in Table 2.4, the direct model shows a statistical significant relationship between entrepreneurs' networking ability and a new venture's revenue, which provides support for Hypothesis 1.

To test for Hypotheses 2a and 2b stating that the relationship between entrepreneurs' networking ability and new ventures' revenue is mediated by the size of new ventures' exchange network and the intensity of exchange relationships, we analyzed the constellation of the relevant path coefficients across the direct, full, and mediation models. In doing so, we examined whether the three conditions necessary for full or partial mediation described by Baron and Kenny (1986) were met. These three conditions are: (1) the predictor must be related to the mediator, (2) the mediator must be related to the dependent variables, and (3) the previously significant

relationship between the predictor and the dependent variables should be eliminated (full mediation) or substantially reduced (partial mediation) when the mediator is accounted for.

Table 2.4. Standardized Path Coefficients—Full Sample Estimation

Description of Paths	Direct Model	Full Model	Mediation Model
Networking ability → Revenue	0.20**	n.s.	
Networking ability → Growth	n.s.	n.s.	
Networking ability → Network size		0.20*	0.20*
Networking ability → Tie strength		0.68**	0.68**
Network size → Revenue		0.16*	0.16*
Network size → Growth		0.93*	0.89*
Tie strength → Revenue		n.s.	0.25*
Tie strength → Growth		n.s.	n.s.
Resource needs → Network size	0.29***	0.24**	0.24**
Resource needs → Tie strength	0.96***	0.70***	0.70***
Resource needs → Revenue	n.s.	n.s.	-0.25^{+}
Resource needs → Growth	n.s.	n.s.	n.s.
High-tech industry → Network size	n.s.	-1.57*	-1.57*
High-tech industry → Tie strength	n.s.	n.s.	n.s.
High-tech industry → Revenue	n.s.	n.s.	n.s.
High-tech industry → Growth	n.s.	n.s.	n.s.
Venture age → Network size	n.s.	n.s.	n.s.
Venture age → Tie strength	n.s.	n.s.	n.s.
Venture age → Revenue	0.36***	0.35***	0.46***
Venture age → Growth	n.s.	n.s.	n.s.
No. of founders → Network size	n.s.	n.s.	n.s.
No. of founders → Tie strength	n.s.	n.s.	n.s.
No. of founders → Revenue	0.20**	0.19*	0.19*
No. of founders → Growth	n.s.	n.s.	n.s.
No. of employees → Network size	n.s.	n.s.	n.s.
No. of employees → Tie strength	n.s.	n.s.	n.s.
No. of employees → Revenue	0.46***	0.46***	0.46***
No. of employees → Growth	n.s.	n.s.	n.s.
Employment growth → Network size	n.s.	n.s.	n.s.
Employment growth → Tie strength	n.s.	n.s.	n.s.
Employment growth → Revenue	n.s.	n.s.	n.s.
Employment growth → Growth	n.s.	n.s.	n.s.

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; $^{+}$ $p < 0.10$; n.s.: not significant

As Table 2.4 indicates, the conditions for a full mediation are met when we include our two network variables in the model.

First of all, networking ability is positively related to network size ($\beta = 0.20$, $p < 0.05$) and to tie strength ($\beta = 0.67$, $p < 0.01$) in the mediation model. Secondly, network size and tie strength are both positively related to revenue ($\beta = 0.16$; $p < 0.05$ and $\beta = 0.25$, $p < 0.05$). Finally, the path from networking ability to revenue, which is significant in the direct model, loses its significance (from $\beta = 0.20$; $p < 0.01$ to $\beta = -0.005$; $p = 0.99$) in the full model that also includes network size and tie strength. In sum, the path coefficient analysis for revenue as the dependent variable thus provides support for Hypotheses 2a and 2b.

2.4.3. Moderation Analysis

As already noted above, we made a subsample comparison to test for the proposed moderating effects of venture age. To do so, we split the sample into one subgroup comprising the firms up to three years of age and another one comprising all the companies that had already completed four or more years of operation. Using this cut-off point seemed appropriate for several reasons: First of all, the median company age in our sample is three years, so applying this criterion results in two commensurate subsets. Additionally, theorists argue that three years is approximately the earliest point in time new ventures might have overcome the liability of newness (Chrisman, Bauerschmidt, & Hofer, 1998), and research results in the field support this notion by providing initial evidence that ventures in these two age categories may indeed profit differently from similar network constellations (Aldrich, Rosen, & Woodward, 1987).

When assessing potential moderating effects, we first checked whether we could apply the same measurement models for our latent variables across our subgroups (Byrne, 2009; Meade, Johnson, & Braddy, 2008). We then compared the path coefficient constellation across the two subgroups. As shown in Table 2.5, we find the constellation that we could already observe when analyzing the full sample to also be evident for the subgroup of younger ventures, whereas none of the paths corresponding with our theoretically proposed relationships reach a conventional level of significance in the subsample of more-mature ones.

In line with this first observation, a comparison of the mediation models reveals clear confirming evidence for Hypotheses 3a, 3b, 3c, and 3d, since we find the size of a new ventures' exchange network as well as the strength of network relationships to be positively related to revenue ($\beta = 0.21$; $p < 0.05$, and $\beta = 0.44$; $p < 0.05$), and entrepreneurs' networking ability to be positively related to network size ($\beta = 0.30$; $p < 0.05$) and to tie strength ($\beta = 0.81$; $p < 0.01$) among younger ventures, but not among more mature ones.

Table 2.5. Standardized Path Coefficients—Split Sample Estimation

Description of Path	Younger Companies			Older Companies		
	Direct Model	Full Model	Mediation Model	Direct Model	Full Model	Mediation Model
Networking ability → Revenue	0.38**	n.s.		n.s.	n.s.	
Networking ability → Growth	n.s.	n.s.		n.s.	n.s.	
Networking ability → Network size		0.30*	0.30**		n.s.	n.s.
Networking ability → Tie strength		0.83**	0.81**		0.55*	0.53^{+}
Network size → Revenue		0.22*	0.21*		n.s.	n.s.
Network size → Growth		0.89^{+}	0.89^{+}		n.s.	n.s.
Tie strength → Revenue		n.s.	0.44*		n.s.	n.s.
Tie strength → Growth		n.s.	n.s.		n.s.	n.s.
Resource needs → Network size	0.25*	n.s.	n.s.	0.35**	0.34**	0.34**
Resource needs → Tie strength	0.98**	0.55*	0.56*	0.93**	0.78**	0.79***
Resource needs → Revenue	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
Resource needs → Growth	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
High-tech industry → Network size	n.s.	n.s.	n.s.	$-.19^{+}$	$-.20^{+}$	$-.20^{+}$
High-tech industry → Tie strength	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
High-tech industry → Revenue	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
High-tech industry → Growth	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
Venture age → Network size	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
Venture age → Tie strength	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
Venture age → Revenue	0.35**	0.26*	0.28*	0.19^{+}	0.19^{+}	0.19^{+}
Venture age → Growth	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
No. of founders → Network size	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
No. of founders → Tie strength	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
No. of founders → Revenue	0.19^{+}	0.20^{+}	0.20^{+}	0.23*	0.23*	0.23*
No. of founders → Growth	n.s.	n.s	n.s.	n.s.	n.s.	n.s.
No. of employees → Network size	n.s.	n.s	n.s.	n.s.	n.s.	n.s.
No. of employees → Tie strength	n.s.	n.s	n.s.	n.s.	n.s.	n.s.
No. of employees → Revenue	0.35**	0.29*	0.29*	0.56**	0.56***	0.56***
No. of employees → Growth	n.s.	n.s	n.s	n.s.	n.s.	n.s.
Employment growth → Network size	n.s	n.s	n.s	n.s.	n.s.	n.s.
Employment growth →Tie strength	n.s	n.s	n.s	n.s.	n.s.	n.s.
Employment growth → Revenue	n.s	n.s	n.s	n.s.	n.s.	n.s.
Employment growth → Growth	n.s	n.s	n.s	n.s.	n.s.	n.s.

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; $^{+}$ $p < 0.10$; n.s.: not significant

Acknowledging that the size of our split samples lies below N = 100, which some authors consider a critical value (Hu & Benterl, 1998), we conducted additional tests to check for the stability of these results. In doing so, we made use of the fact that the power of a statistical test depends on the relationship between the number of

parameters estimated and sample size (Muthén & Muthén, 2002). Accordingly, we first constructed and ran a model based on indices instead of latent variables, which considerably reduced the number of estimated parameters. Additionally, we tested our moderation hypotheses by means of moderated regression analyses. Both additional analyses confirmed our findings.

2.5. Discussion

The present paper examines the relationship between entrepreneurs' networking ability and new ventures' financial performance. Specifically, we address the questions of if, how, and under which conditions entrepreneurs' networking ability might affect the financial performance of their new ventures.

2.5.1. Entrepreneurs' Networking Ability and New Ventures' Financial Performance

In line with our first hypothesis, our results indicate a significant relationship between entrepreneurs' networking ability and their new venture's financial performance. In general, this result is consistent with previous research in the field showing that the personal characteristics of entrepreneurs, such as their personality, skills, and experiences may play a significant role in explaining their new ventures' performance (Baum & Locke, 2004; Rauch & Frese, 2007). More specifically, our finding underscores existing research results on the relevance of entrepreneurs' interpersonal skills. As already described above, there are some common roots between political skills and other social-skill and social-competence concepts, meaning that one has to empirically expect them to be interrelated (Ferris, Perrewé, & Douglas, 2002; Hochwarter et al., 2007). As to the extent of this interrelation, our results complement previous findings on a positive relationship between entrepreneurs' social skills and their new ventures' performance (Baron & Markman, 2003; Baron & Tang, 2009), by showing that this link not only holds true in the national contexts of the US and China, but also in Germany.

However, we have to acknowledge that the relevance of entrepreneurs' networking ability was only clearly observable for revenue, which is only one of the two financial performance variables that we used in our study. Considering that the other reflected the percentagewise increase in revenue and profit, this observation is not necessarily very surprising. As prior research has shown, these two variables represent different dimensions of new venture performance that have been frequently found not to be highly correlated (see, for example, Chandler & Hanks, 1993; Combs,

Crook, & Shook, 2005; Murphy, Trailer, & Hill, 1996; Tosi, Werner, Katz, & Gomez-Mejia, 2000).

Additionally, we think that there might be a theoretical explanation for these differences that may become clearer when considering the following illustrative example: In line with our results regarding the relationship between entrepreneurs' networking ability and new ventures' financial performance, Venture A, founded by an entrepreneur with superior networking ability yields a revenue of TEUR 90 in its second year of operation. At the same time, venture B, which is run by an entrepreneur less-skilled in networking, but otherwise similar to Venture A, would realize TEUR 75 in revenue. Consistent with our results on the link between entrepreneurs' networking ability and new ventures' growth, both of these two ventures would have grown at the same rate in the second year of their operation, for example, by 50 percent. This implies that venture A would have had TEUR 60 in revenues in its first year of operation, whereas venture B would have had only TEUR 50. This example implies that our results of a significant connection between entrepreneurs' networking abilities and revenue, but not with growth rates, might be explained by the fact that new ventures run by an entrepreneur with more-distinct networking skills realize superior revenues in their first year of operation and subsequently realize superior growth in absolute, but not in relative terms. In turn, this explanation would point to the fact that new ventures' financial performance particularly profits from entrepreneurs more highly skilled in networking, since, because of their more valuable pre-existing network relationships, they are especially good at developing favorable exchange relationships for their new ventures when the venture is founded.

Even though this explanation fits with previous research showing that new ventures' networks in early start-up development are largely dominated by the pre-existing social ties of their entrepreneurs (Hite & Hesterly, 2001; Lechner et al., 2006), we clearly have to admit that this reasoning is speculative. Consequently, we want to encourage further research to address this question in more detail. In this context, we think it might also be interesting to shed some additional light on the networking behavior and strategies typical for entrepreneurs highly skilled in networking and, for example, specifically address whether entrepreneurs more highly skilled in networking also more heavily rely on symbolic management practices (Zott & Quy Nguyen, 2007).

Even in view of the described need for further research, we think that the observed relationship between entrepreneurs' networking ability and new ventures' financial performance offers some practical implications for entrepreneurs. In view of the fact that networking ability is a quite stable but trainable skill (Treadway, Ferris,

Duke, Adams, & Thatcher, 2007), our results specifically imply that entrepreneurs should consider either including people with significant networking abilities into their founding team and/or seeking assistance and training opportunities to enhance their networking abilities in order to be more successful in starting and developing a new venture.

2.5.2. The Mediating Role of New Ventures' Network Characteristics

In line with our mediation hypotheses, the results of our study indicate that the relationship between entrepreneurs' networking ability and the financial performance of new ventures is mediated by the size of the new ventures' exchange network and the strength of exchange network relationships. In particular, these results underline our reasoning that new ventures' financial performance benefits from entrepreneurs that are, due to their characteristically subtle and engaging style and their expertise in networking strategies, able to develop more and stronger network ties for their new ventures.

In general, this finding contributes to answering the question of how individual-level skills may impact macro-level variables in the field of entrepreneurship (Baron, 2007; Rauch & Frese, 2007; Zhao et al., 2010) by pointing to the fact that some of the mechanisms explaining the relevance of personal characteristics may be related to differences in individuals' capacity to shape parts of their social environments according to their new venture's needs. Additionally, these findings also contribute to network theory in the field of entrepreneurship. Specifically, they complement previous results pointing to how environmental characteristics, such as environmental uncertainty or industry-specific conditions, influence new ventures' networks (Rosenkopf & Schilling, 2007; Schutjens & Stam, 2003) and emphasize entrepreneurs' networking skills as one of the person-related foundations of new ventures' networks, which have so far been widely neglected by empirical research (Baron, 2007; O'Donnell et al., 2001).

On a more concrete level of analysis, the results of our mediation analysis may also round out previous findings on why entrepreneurs' interpersonal skills affect new ventures' performance. Specifically, Baron and Tang (2009) provided confirming evidence for the notion that entrepreneurs with distinct social skills may be better able to acquire external resources for their new ventures. When now taking into account the common roots of political and social skills, as well as the fact that new ventures are expected to profit from larger exchange networks and stronger exchange relationships because such networks provide access to needed resources at attractive terms, one could argue that a partial cause for Baron and Tang's finding on the relationship between social skills and resource access may be entrepreneurs'

capability to develop more beneficial exchange networks comprising more network partners and stronger exchange ties. Even though this line of reasoning seems compelling, we clearly have to admit that we are not able to provide empirical evidence supporting it. Because we expect that continuing to address the relationship between entrepreneurs' social and political skills and new venture performance may further enhance our understanding of the mechanisms and processes linking person-related micro-level to firm-related macro-level variables in the field, we consequently want to encourage additional research to address the interrelation of social and political skills, resource access, and new ventures' network characteristics and financial performance in more detail.

2.5.3. The Moderating Influence of Venture Age

Our moderation analysis reveals that the relationship between entrepreneurs' networking ability and new ventures' network characteristics, as well as the links between these network characteristics and new ventures' financial performance, are moderated by venture age, in terms of being stronger for younger businesses.

Regarding the relationship between entrepreneurs' networking ability and the firm-level network, our results thus complement previous findings on the decreasing significance of entrepreneurs' personality traits for relevant outcomes in the field (Frank et al., 2007). Specifically, they point to the fact that a similar effect may also hold true for other individual-level characteristics, such as entrepreneurs' skills and thus underline the notion that 'new businesses tend to emancipate themselves from their initiators' (Frank et al., 2007: 248).

Supporting our proposition that younger ventures in particular profit from establishing large networks with strong exchange relationships, the results of our moderation analysis also add to the literature on entrepreneurs' networks. Specifically, they contribute to the ongoing debate on the benefits that come with stronger and weaker network relationships (Hoang & Antoncic, 2003; Jack, 2010), as they support the classical, but empirically only once-confirmed notion that younger firms may especially benefit from more-intense network relationships (Aldrich et al., 1987). In pointing to the fact that establishing larger exchange networks may also be primarily relevant for younger businesses—which has, to the best of our knowledge, so far not been discussed in prior research—our study sheds even more light on how organizational variables may conditionally limit the relevance of new ventures' network characteristics.

2.5.4. Additional Limitations and Avenues for Further Research

Besides the limitations associated with the use of self-reported data, which we have already discussed in the method section, we clearly have to acknowledge some additional ones. The first is a result of our cross-sectional research design, which implies that a clear causal interpretation of our results is not possible. One could thus reverse the interpretation of the pertinent results and say that better financial performance or the existence of more and stronger relationships in the new venture's network could lead entrepreneurs to a self-perception of having a distinct networking ability. However, there are a couple of arguments against this interpretation. First, previous studies in the field of career research that collected networking ability data at one point in time and afterwards data on various dependent measures found that networking ability clearly predicts positive work outcomes (Ferris et al., 2005; Hochwarter et al., 2007). Second, and as already noted above, research also indicates that even though networking abilities may be improved through training interventions, they tend to be quite stable over time (Treadway et al., 2007). Together, these arguments offer some support for interpreting our empirical results in a manner as proposed by our hypotheses.

As an additional limitation of our study, we have to acknowledge that it is solely based on data from entrepreneurs and their new ventures in Germany. Our results may thus not be representative for entrepreneurs in other national contexts. Considering that prior research points to a potential moderating effect of national contexts on the relationship between network variables and performance (Batjargal, 2010a), we consequently think that studying the impact of entrepreneurs' networking ability in other countries and addressing a potential moderating influence of national context differences is a fruitful direction for further research.

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Chapter 3

Networking Ability and the Financial Performance of New Ventures: Moderating Effects of Venture Size, Institutional Environment and their Interaction

3.1. Introduction

Networking ability is an individual-level skill, defined as the ability to develop friendships and build strong, beneficial alliances and coalitions (Ferris et al., 2005). In an intra-organizational context, it has been found to positively influence managerial job performance (Semadar et al., 2006), income (Ferris et al., 2008; Wolff & Moser, 2009), promotions and career, as well as life satisfaction (Todd et al., 2009). Most recently, however, it has also been shown that networking ability is relevant in an entrepreneurial context. Specifically, Batjargal (2010b) found that entrepreneurs' networking skills enable them to attract a greater number of institutional investors. Additionally, Semrau and Sigmund (forthcoming) have shown that entrepreneurs with high networking ability realize a higher financial performance, as they are able to build larger exchange networks with stronger exchange relationships. However, the authors also provided initial evidence for the notion that the impact of entrepreneurs' networking ability on new venture performance may be influenced by organizational variables. Specifically, they have shown that the positive relationship between entrepreneurs' networking ability and new venture performance is moderated by venture age.

This study is designed to extend this prior research. Specifically, it addresses the effect of entrepreneurs' networking ability on a new venture's financial performance in different institutional environments. Additionally, our study sheds light on the potential moderating role of venture size on the relationship between entrepreneurs' networking ability and new ventures' financial performance, and how this moderating role differs across institutional environments.

Addressing the effects of venture size and institutional context on the relationship between entrepreneurs' networking ability and new venture performance seems fruitful for several reasons. First of all, previous research has pointed to the fact

that venture age has a significant moderating effect on the relationship between entrepreneurs' networking ability and the performance of their new ventures (Semrau & Sigmund, forthcoming). Theoretically, this effect is grounded in the fact that younger ventures suffer from the liability of newness, such as a lack of organizational legitimacy (Aldrich & Auster, 1986; Stinchcombe, 1965) and as a consequence may have to rely on entrepreneurs' networking ability to be successful. Other than suffering from the liability of newness, however, new ventures are also widely recognized to suffer from a liability of smallness, meaning that they lack necessary resources and thus need external support while at the same time are rather unattractive as exchange partners (Aldrich & Auster, 1986). In view of these observations, and the fact that the liabilities of newness and smallness have been shown to be conceptually and empirically distinct concepts (Brüderl et al., 1992; Freeman et al., 1983), contributing to research on the potential moderating role of venture size, when controlling for venture age, extends our knowledge of how organizational-level concepts and variables affect the relevance of entrepreneurs' characteristics on new venture performance.

Second, researching how differences in the institutional environment affect the relationship between entrepreneurs' networking ability and new venture performance, as well as the interaction between venture size and this relationship, seems fruitful because it answers the calls a) for better contextualizing entrepreneurship research (Welter, 2011), and b) for shedding light on how a potential interplay of organizational-level and environmental variables influence the relevance of entrepreneurs' individual characteristics for their new ventures' performance (Baron, 2007; Korunka et al., 2003; Rauch & Frese, 2007).

The paper is organized as follows: in the next section, we present our theoretical reasoning and develop our hypotheses. We then describe our research method and the results of our empirical analysis based on a sample comprising the data of new ventures from Germany, which have previously also been used by Semrau and Sigmund (forthcoming), and additional data from new ventures in Brazil. We then discuss the results of our analysis, which significantly support our hypotheses by providing evidence for a) a positive effect of entrepreneurs' networking ability on new venture performance in both institutional contexts; b) a moderating effect of venture size; and c) a significant three-way interaction between networking ability, venture size, and institutional context. We then conclude with some remarks on the limitations and the contribution of our study.

3.2. Theory and Hypotheses

A large body of research indicates that person-related variables may exert a significant influence on entrepreneurial activity and success (Frank et al., 2007; Mitchell et al., 2002; Rauch & Frese, 2007; Shaver & Scott, 1991). Among those variables identified are cognitive factors, such as risk-taking propensity and internal locus of control (Arenius & Minniti, 2005; Caliendo et al., 2009; Hansemark, 2003; Walter & Walter, 2009); variables describing entrepreneurs' backgrounds and experiences, such as previous work and founding experience as well as general human capital (Brüderl et al., 1992; Colombo & Grilli, 2005; Davidsson & Honig, 2003; Diochon et al., 2008); and sociodemographic variables like age and gender (Brush, 1992; Langowitz & Minniti, 2007; Minniti, 2010). Additionally, recent research provides empirical evidence for a link between entrepreneurs' skills and the success of their ventures. In particular, Baron and Markman (2003) and Baron and Tang (2009) have shown that entrepreneurs' social skills are associated with the financial performance of new ventures, and Batjargal (2010b) as well as Semrau and Sigmund (forthcoming) provide initial evidence for the notion that entrepreneurs may profit from a distinct networking ability.

However, prior research also indicates that the relevance of individual-level factors on the performance of new ventures may be limited to certain conditions. Frank, Lueger and Korunka (2007), for example, have shown that the relevance of personality traits for the success of entrepreneurs is much stronger in pre- than in post-founding stages of the entrepreneurial process. Similarly, Baron and Tang (2009) provide evidence for the notion that the industry in which new ventures operate may have an effect on the performance relevance of entrepreneurs' individual skills. Furthermore, Semrau and Sigmund (forthcoming) have shown that the effect of entrepreneurs' networking abilities on the performance of new ventures is moderated by a new ventures' age.

In addition to this evidence, prior research has also shown that differences in the institutional context in which individuals are embedded may impact the relevance and use of network ties (Batjargal, 2010a; Peng & Luo, 2000). For instance, Xin and Pearce (1996) found that network relations may serve as substitutes for formal institutional support in a less-developed institutional framework.

Based on these prior insights, we develop a theoretical rationale for how new ventures' size and their institutional context may affect the relationship between entrepreneurs' networking ability and new ventures' financial performance. Before doing so, however, we will briefly describe why we expect entrepreneurs' networking ability to have a positive effect on the financial performance of their new ventures.

3.2.1. Networking Ability and the Financial Performance of New Ventures

Networking ability is the "core dimension" of the political skills concept (Blass et al., 2007 p. 93; Todd et al., 2009 p. 187). It describes one's ability to develop friendships; build strong, beneficial alliances and coalitions; and understand power structures and establish social relations according to one's personal objectives (Blass et al., 2007; Ferris et al., 2005; Hochwarter et al., 2007; Peled, 2000; Semadar et al., 2006). As an important dimension of the political-skills concept, networking ability has been empirically found to positively influence managerial job performance (Semadar et al., 2006), income (Ferris et al., 2008; Wolff & Moser, 2009), promotions and career, as well as life satisfaction (Todd et al., 2009).

More recently, research has also shown that networking ability is relevant in an entrepreneurial context. In particular, Batjargal (2010b) observed that entrepreneurs' networking ability helps them to attract a greater number of institutional investors. Complementing this result, Semrau and Sigmund (forthcoming) found that entrepreneurs' networking ability impacts the financial performance of their new ventures, because it enables them to establish favorable exchange relationships which in turn facilitate the new venture's financial performance. Specifically, their study revealed that the relationship between entrepreneurs' networking ability and the financial performance of their new ventures is mediated by two characteristics of the new ventures network—network size and the strength of exchange ties.

Theoretically, this result may be explained by the fact that both network characteristics have a positive impact on the resources available through a new venture's network. In fact, larger networks are likely to provide more, and a greater variety, of resources since they consist of more network partners able to grant resource access (Batjargal, 2003). Analogously, stronger network-exchange relationships are also expected to be beneficial for new ventures because closer relationships and more-frequent interactions motivate exchange partners to grant access to their resources at more favorable terms (Krackhardt, 1992; McFadyen & Cannella Jr, 2004; Steier & Greenwood, 2000), and make resource exchanges more efficient (McFadyen & Cannella Jr, 2004; Uzzi, 1997).

In view of these arguments and the fact that prior research has shown that entrepreneurs in very different institutional contexts profit from resource exchanges via network relationships (Batjargal, 2010a; Lechner et al., 2006; Xin & Pearce, 1996), we expect that the positive impact of entrepreneurs' networking ability on the financial performance of their new ventures is not limited to a specific national context. Consequently, we propose:

H1. *Entrepreneurs' networking ability is positively related to the financial performance of their new venture, irrespective of the institutional context examined.*

3.2.2. The Moderating Impact of New Venture Size

As already indicated by prior research, the impact of networking ability on new venture performance seems to be influenced by certain firm-level conditions. Specifically, Semrau and Sigmund (forthcoming) have shown that the relationship between both variables is moderated by company age, i.e., is stronger for younger than for more-mature ventures. The reasoning given for this effect is that more-recently founded ventures lack a track record of prior performance and exchange relationships and thus have greater difficulties motivating potential network partners to cooperate, so that distinct networking abilities are especially useful for them when trying to establish needed support networks.

However, we do not expect new venture age to be the only firm-level moderator of this relationship. Specifically, we expect the size of a new venture to also have a moderating effect on the relationship between entrepreneurs' networking ability and new venture performance, even when venture age is kept constant. As proposed by many theorists in the field, new ventures suffer not only from a liability of newness but also from a liability of smallness (Aldrich & Auster, 1986; Kale & Arditi, 1998; Strotmann, 2007). Empirically, the size of a new venture is often coupled with its age, but not all organizations are born small or grow at the same rate in the course of their development (Aldrich & Auster, 1986). In fact, Freeman et al. (1983) as well as Brüderl et al. (1992), have shown that firm size is a factor that turns out to influence venture survival, even when controlling for venture age. The theoretical reasoning behind this result is that not only younger but also smaller firms face severe problems when trying to master the challenges involved in organizational development. First, small firms often have very limited financial and physical resources, a fact that makes them vulnerable to market contractions (Aldrich & Auster, 1986; Carayannopoulos, 2009). Even if they are able to raise capital via traditional market exchange, they usually have to pay higher interest rates and face more demands for changes that compromise the founders' concept of the organization (Aldrich & Auster, 1986; Strotmann, 2007). Second, smaller organizations not only suffer from scarcity of financial and physical resources; they usually also lack the managerial knowledge that larger companies possess, as they less likely to attract competent personnel (Aldrich & Auster, 1986; Kale & Arditi, 1998). As a result, we expect that smaller ventures are more dependent on external support than are their larger counterparts when it comes to getting access to financial capital, other physical

assets, and relevant knowledge and information (Carayannopoulos, 2009; Strotmann, 2007).

In addition, a small firm will most likely have problems motivating potential network partners to cooperate. Again, our reasoning here is twofold: first, small ventures suffer from restricted visibility and organizational reputation, which limits their initial pool of potential partners (Milanov & Fernhaber, 2009). Second, due to their lack of resources, they are unable to directly reciprocate within a network-based exchange. Consequently, potential network partners will usually hesitate to invest in an exchange relationship even when they become aware of a new venture.

Based on these facts, we expect smaller ventures' financial performance to be more-strongly related to their founders' networking ability than the financial performance of their bigger counterparts for two reasons: a) smaller ventures will have to rely on greater external support to compensate for larger resource constraints; and b) because of limited organizational visibility and legitimacy, smaller ventures will have to rely more extensively on entrepreneurs' subtle and convincing style that comes with distinct networking abilities in order to develop network exchange relationships. Expecting that entrepreneurs' networking ability will be more important for smaller than for larger ventures, we suggest that the relationship between entrepreneurs' networking ability and their new ventures' financial performance will be negatively moderated by venture size. We thus propose:

H2. *There will be a negative moderating effect of venture size on the relationship between entrepreneurs' networking ability and their new ventures' financial performance*

3.2.3. The Moderating Impact of the Institutional Environment

Besides the size of a new venture, we propose that the institutional environment in which a new venture operates also moderates the impact of entrepreneurs' networking ability on its performance.

Institutions are defined as multifaceted, durable social structures composed of regulative, normative, and cultural-cognitive elements (Scott, 2001). Social actors are embedded in environments that vary extensively among these three dimensions (Baumol, 1993, 1996, 2005; North, 1990, 1994, 2005) that are widely recognized as exerting a strong influence on economic behavior in general (Ralston, Holt, Terpstra, & Yu, 2008), and entrepreneurial activity in particular (Aidis, Estrin, & Mickiewicz, 2008; Batjargal, 2007; Ralston et al., 2008). Acs, Desai, and Klapper (2008), for example, found significant differences in entrepreneurial activity when analyzing data

from different institutional environments. Similarly, Tominc and Rebernik (2007) conclude that different intensities of institutional support for entrepreneurial behavior in post-socialist countries have significant effects on the rate of new venture formation and subsequent firm development.

Additionally, there is some empirical evidence indicating that institutional differences may also have a significant moderating impact on the relationship between the characteristics of a new venture's network and its performance. Batjargal (2010a), for instance, provides confirming evidence for the notion that the effect of certain network structures on performance is contingent on institutional context-differences, and Sheng, Zhou, and Li (2011) found that network ties are more important for firm performance in less-developed institutional environments than in more-developed ones. Based on these observations, we argue that entrepreneurs' individual networking ability, as an important antecedent of new ventures' network characteristics, will have a much stronger impact on the performance of a new venture in environments with a less-developed institutional framework than it will in those environments with more fully developed regulative frameworks.

Highly developed institutional environments are characterized by a stable rule of law, the existence and enforcement of a commercial code, and a functioning court system (Djankov, Miguel, Qian, Roland, & Zhuravskaya, 2005; McMillan & Woodruff, 1999). In such an environment, entrepreneurs may rely on contractually safeguarded exchange relationships as a way to easily enforce their rights. In contrast, entrepreneurs operating in less-developed institutional environments cannot rely on enforcing contractual rights to a similar extent, and may thus be faced with severe risks and opportunistic behavior when engaging in such exchange arrangements (Aidis & Adachi, 2007; Aidis et al., 2008; Batjargal, 2003; Radaev, 2002; Sedaitis, 1998). As a result, they have to substitute formal institutional support by relying on informal institutions such as trusted exchange partners and mutual safeguarding (Khanna & Palepu, 1997; Peng & Luo, 2000). Consequently, we expect that being able to rely on trust and reciprocity-based network exchange relationships is much more relevant for entrepreneurs in less-developed institutional environments (Sheng et al., 2011; Zhou & Peng, 2010) and consequently also expect entrepreneurs' networking ability to be more valuable in these contexts.

Additionally, we expect entrepreneurs from less-developed institutional contexts to particularly profit from distinct networking skills, as these skills should help them to develop political ties that are particularly needed in less-developed institutional environments. Political ties are informal social connections with government officials in various levels of administration (Sheng et al., 2011). Especially in weaker institutional environments, such relationships are valuable

because governments officials and politicians control access to major business opportunities and may provide crucial support in terms of subsidies, favorable regulations, protection against competitors, tax benefits, and so on (Boddewyn & Brewer, 1994; Hillman & Hitt, 1999; Oliver & Holzinger, 2008; Schuler, Rehbein, & Cramer, 2002). Supporting this line of reasoning, several previous studies point out that political ties are imperative for survival and growth in environments with less-developed institutional settings (Baron, 1995; Sheng et al., 2011), and we expect entrepreneurs with more-distinct networking abilities to be better able to develop such ties.

Summing up, we expect entrepreneurs in less-developed institutional environments to particularly profit from distinct networking abilities, because they should enable them to establish the exchange relationships and political ties that are especially crucial in these contexts. Conversely, we expect the relationship between entrepreneurs' networking ability and their new ventures' financial performance to be weaker in a more-developed institutional context. We thus propose:

H3. *The relationship between entrepreneurs' networking ability and their new ventures' financial performance will be weaker in a more-developed institutional environment.*

3.2.4. The Combined Impact of Venture Size and the Institutional Environment

In addition to the moderating effects described above, we expect that differences in institutional environments will also affect the moderating influence of venture size on the relationship between entrepreneurs' networking ability and the financial performance of their new ventures. Specifically, we suggest the negative moderating effect of venture size on the relationship between networking ability and new ventures' financial performance to be stronger in more-developed institutional environments.

As described above, the rationale for the negative moderating effect of venture size on the relationship between networking ability and new venture performance is that larger ventures a) do not have to rely as heavily on external-resource providers as do their smaller counterparts, and b) are able to rely on their visibility and greater organizational legitimacy when trying to attract potential network partners. As a result, we propose that the relevance of entrepreneurs' networking ability declines as new ventures grow.

As also described above, however, we expect entrepreneurs in less-developed institutional contexts to particularly profit from distinct networking abilities, since

they not only have to establish the resource-exchange relationships needed by new ventures in general, but also have to develop political ties to government officials and bureaucrats. Assuming that these political ties remain crucial for new ventures in less-developed institutional contexts, even when they grow, and also assuming that political ties have to be managed by the entrepreneur him- or herself no matter how large his or her company is, we expect that entrepreneurs' networking ability remains significantly more crucial for their ventures' financial success as it grows.

Confirming the notion that political ties remain important even when a new venture grows, previous research has found that a large percentage of the value of top-performing firms in Indonesia—which can be considered a less-developed institutional environment—is derived from political connections (Fisman, 2001). Similarly, based on her case-based research, Dieleman (2012) explains that even Indonesian firms of considerable size are likely to fail if ties to officials, such as politicians and bureaucrats, are severed.

Additionally, there exists considerable evidence for the notion that, even as their ventures grow, entrepreneurs in less-developed institutional contexts continuously have to manage their political ties, whereas the management of non-political ties may often be delegated. De Vries and Florent-Treacy (2003), for instance, vividly describe that the politicians and bureaucrats to whom entrepreneurs developed viable network relationships in Russia did not accept another contact person within the company, even as the firm grew and became a major player in the industry. Quite similarly, Dieleman (2012) observed that deals between companies and governmental officials in Indonesia are always based on personal relationships and personal interaction, even when companies have already grown and obtained a high level of organizational legitimacy.

Summing up, we thus expect that a) the relevance of political ties for ventures' financial performance is sustained in less-developed institutional contexts even when a new venture grows, and b) that political ties continuously have to be managed by the entrepreneur him- or herself. Consequently, we expect that entrepreneurs' networking ability, which enables him or her to effectively develop and manage political ties, will remain significantly more important in less-developed institutional contexts, even when a venture grows in size. Conversely, we expect the negative moderating effect of venture size on the relationship between entrepreneurs' networking ability and their new ventures' financial performance to be stronger in more-developed institutional contexts. We thus posit:

H4. *The negative moderating effect of venture size on the relationship between entrepreneurs' networking ability and their new ventures' financial performance will be stronger in more-developed institutional contexts.*

3.3. Method

Because our aim was to address the impact of entrepreneurs' networking ability on the performance of new ventures in significantly different institutional environments, we decided to rely on the data of German entrepreneurs previously used by Semrau and Sigmund (forthcoming), and to collect additional data from new ventures in Brazil.

Whereas the institutional context in Germany has to be considered fully developed and reliable, entrepreneurs in the emerging economy of Brazil have to cope with a significantly less-developed institutional setting. This perspective is supported by the results of the Worldwide Governance Indicators (WGI) project (Kaufmann, Kraay, & Mastruzzi, 2006). In this project, the quality of the institutional frameworks of 212 countries was characterized by several indicators, such as the perceived quality of contract enforcement, property rights, the likelihood of crime and violence, and the extent to which public power is seen as being exercised for private gain, including both petty and grand corruption (Kaufmann et al., 2006). On all these indicators, Brazil scores significantly lower (ranked between 25th and 50th in terms of percentile ranking) than Germany (above 90th) (Kaufmann et al., 2006).

To obtain a parallel sample for the German data set, we followed the strategy described by Semrau and Sigmund (forthcoming) and contacted institutions that support entrepreneurial activities and asked them to promote the research project. Due to privacy concerns, most of the people contacted refused to provide the contact information on newly founded ventures, but instead offered to invite the founders associated with their institutions to take part in our online survey. As a result, we were able to collect data on 201 entrepreneurs and their new ventures in Brazil. We then combined this data with the data from German entrepreneurs, excluded companies that were not independent and further restricting the sample with respect to company age. Consistent with other studies in the field, we excluded all firms less than one year old (Hansen, 1995; Sorenson et al., 2008) and companies established more than ten years ago (Covin et al., 1990; Lechner et al., 2006). We then had to exclude more data sets because of missing values, leaving 283 usable responses in total—158 from German and 125 from Brazilian entrepreneurs.

3.3.1. Measures

Because there were no objective data available to represent the main explanatory and dependent variables in our study, we had to rely on self-reported measures. We are confident that this approach led to results with reasonable validity. First, most of our variables are concrete attributes, which are typically reported more accurately than psychological constructs (Fuchs & Diamantopoulus, 2009). Second, previous research in entrepreneurship gives broad support for the reliability and validity of self-reported measures (Brush & Vanderwerf, 1992; Lechner et al., 2006; Peng & Luo, 2000). Third, we took several additional steps (described later) to ensure the quality of our measures.

3.3.1.2. New Ventures' Financial Performance

Firm performance is a multidimensional construct, and specifically measuring new venture performance presents a significant challenge for scholars (Carton & Hofer, 2006; Chandler & Hanks, 1993). Following Chandler and Hanks' (1993) recommendations for developing reliable and valid measures to capture new venture performance, two distinct variables—actual revenue and revenue growth—were used in this study. Both of these variables measure values in broad categories to overcome problems that may potentially be caused by respondents' unwillingness to disclose precise financial-performance information. To operationalize the two variables, we relied on items that have shown their validity in prior research (see, Chandler & Hanks, 1998; Honig et al., 2006; Lee & Tsang, 2001).

To get comparable results on revenue in both countries, we used the same categories in Brazil that were used in Germany but converted the answer categories from EURO to Brazilian Real according to exchange rates in December 2008. Specifically, the entrepreneurs were asked to indicate their revenue in 2008 in nine categories. The nine categories ranged from one (up to €50 thousand) to nine (more than €10 billion) for the German entrepreneurs and from one (up to R$150 thousand) to nine (more than R$30 billion) for the Brazilian entrepreneurs.

Second, we asked our respondents to indicate their cumulative revenue growth rate since 2005 or since the business had been established. Growth rates were grouped in seven brackets ranging from one (less than five-percent growth) to seven (more than 200-percent growth) and had to be indicated for a three-year period (or compared to their first full year of operation if the new venture was younger than three years). We then divided the cumulative revenue growth rates by three (or company age if the company was younger than three years) to obtain a comparable average annual growth

rate. To compensate for skewness, we used the natural log of the category means of both variables in our regression analysis.

3.3.1.3. Networking Ability

To capture networking ability, three items from the networking-ability scale of the Political Skill Inventory (Ferris et al., 2005; Ferris et al., 2007) were adapted to an entrepreneurial context and used. Specifically, respondents were asked to indicate on a seven-point scale to what extent the people in their founding team who liaise with external partners a) had already spent substantial time and effort networking with others, b) had been good at building relationships with influential people, and c) had been good at using their connections and network to make things happen even before the new venture was founded. The Cronbach's alpha for the three items in our study was .87 and thus equal to the value reported for the networking-ability scale in previous studies (Blass et al., 2007; Ferris et al., 2005).

3.3.1.4. Developmental Status of the Institutional Environment

To account for the differences in the institutional environments, we followed the method used by Batjargal (2008; 2010a) and constructed a dummy variable. This dummy variable took the value of one for the German and zero for the Brazilian context because, as already described above in detail, Brazil scores consistently lower than Germany on all relevant indicators for the quality of institutional environment such as contract enforceability, property rights, the likelihood of crime and violence, and the extent to which public power is seen as being exercised for private gain, including both petty and grand corruption (Kaufmann et al., 2006).

3.3.1.5. New Venture Size

We assessed new venture size by asking respondents to indicate the number of founders and current employees, in their organization. We then aggregated the two measures. In addition to employing new venture size as a moderator when testing hypothesis 2, we included it as a control in all other analyses. In doing so, we accounted for the fact that new venture size and financial performance are expected to be closely related (Birley, 1987; Boyd, Gove, & Hitt, 2005). Thus, we were able to specifically address the potential effect of entrepreneurs' networking ability on new venture financial performance, which may—as theorized above, and also addressed by Semrau and Sigmund (forthcoming)—be explained by the impact of entrepreneurs' networking abilities on the network characteristics of their new ventures.

3.3.1.6. Controls

As Rosenkopf and Schilling (2007) demonstrate, network structures may vary substantially across industries that differ in terms of technological dynamism and uncertainty and we expect entrepreneurs in Germany and Brazil to potentially differ regarding the propensity to found a high-tech venture. Therefore we included a dummy variable to indicate whether a firm belongs to a *high-tech industry*. Taking into account that entrepreneurs in Brazil and Germany have been found to differ with respect to industry sector participation (Kelley, Singer, & Herrington, 2012), and that industry sector may potentially influence the relationship between entrepreneurs' individual skills and new venture performance, we also included a dummy variable indicating whether the new venture is operating in *services* or not. Furthermore, we included *company age* as a control variable for two reasons: First, we wanted to empirically eliminate effects that are grounded in the liability of newness (Freeman et al., 1983). Second, venture age typically corresponds to a firm's resource base and legitimacy, and thus may influence its revenue potential (Stam & Elfring, 2008). To capture company age, we asked our respondents to indicate how many (complete) years the new venture had been operating.

3.3.2. Data and Construct Validity

Based on the data-validation efforts made by Semrau and Sigmund (forthcoming) for the German data, we took considerable efforts to also ensure the validity of the data from Brazil. To test for response bias, we grouped responses by arrival date and compared early to late respondents with respect to several of our independent and dependent variables using one-way analyses of variance. Additionally, we checked for nonresponse bias to the extent that anonymous respondents more closely resembled nonrespondents (BarNir & Smith, 2002), by comparing the answers of anonymous respondents in our sample with those who provided us with company names and e-mail addresses.

To check for common-method bias, we conducted Harman's one-factor test (Harman, 1967). The basic idea of Harman's one-factor test is that if a substantial quantity of common-method variance exists, either one dominant factor will account for most of the covariance amongst the variables or only one single factor will emerge. To check for this potential threat to the validity of our results, we entered all our variables in the study into a factor analysis and found that five factors with eigenvalues greater than one were extracted. With the first factor explaining just 20 percent of the variance, we concluded that common-method variance is not a severe problem in our study.

Additionally, we compared our data with external sources of information to ensure its validity. For the new ventures in both countries, research assistants searched the internet for information on those companies that provided their company names and collected all the data relevant to our study, such as firm age and the number of founding team members. The correlations between the self-reported measures and internet data were all highly significant and ranged from $r = .96$ ($p < .00$, $N = 67$) for company age to $r = .98$ ($p < .00$, $N = 60$) for the number of founding team members.

Furthermore, all founders who contacted the researchers after participating in the survey were asked to provide the contact details of a person outside their company who is acquainted with the founding team members and whom we could interview to validate some of the answers given. As a result of this strategy, 53 people (33 Brazilians and 20 Germans) were contacted and asked to rate the founding team members' networking ability. The correlations between founders' perceptions about founding team members' networking ability and how founders' network ability was perceived by others ranged from $r = .78$ ($p < .00$, N = 53) to $r = .84$ ($p < .00$, N = 53) for the items used.

Whereas the answers provided on new ventures' financial performance in Germany were validated by making use of listings in the commercial register and the information available via databases (Semrau & Sigmund, forthcoming), we followed Batjargal's (2010a) approach and validated the financial-performance information provided by entrepreneurs in Brazil with taxation-department officials. To do so, we submitted the revenue information of 20 randomly chosen companies to the taxation department. From these 20 companies, the taxation officials were able to identify 17 and reported that 82 percent of our revenue information fit perfectly with their data. As a result, we are confident that the financial-performance data used in our study are of sufficient validity.

3.4. Results

Means, standard deviations, and correlations for all variables in our sample are shown in Table 3.1.

Table 3.1. Means, Standard Deviations and Correlations

N= 283	Mean	SD	1	2	3	4	5	6	7	8
1. Revenue	407491.13	1395429.30	1	.087	.078	.432*	-.012	.153*	-.026	-.071
2. Revenue growth	39.89	59.76		1	.077	.001	.108	-.158*	.022	.066
3. Networking ability	3.88	1.61			1	.093	-.106	-.060	.023	.065
4. Venture size	7.61	15.68				1	-,100	,253*	,070	-,083
5. Inst. env. (Germany)	.56	.50					1	-.047	-.061	.256*
6. Company age	4.09	2.68						1	.061	-.013
7. High-tech industry	.59	.49							1	.161*
8. Service provider	.74	.44								1

* $p < .05$, two-tailed test

We tested our hypotheses using hierarchical-moderated regression analyses, which allow us to compare alternative regression models with and without interaction terms. As recommended by Aiken and West (1991) and Frazier, Tix, and Barron (2004), we mean-centered and standardized all our non-binary independent variables and moderator variables. We then formed the interaction term by multiplying the respective measures.

Computing our regression, we first entered the control variables before testing the isolated effect of networking ability in the second step. In the third and fourth step we included the two interaction terms to test our moderation hypotheses. For all of the models, we computed several regression diagnostics and checked the variance inflation factors (VIF) to exclude multicollinearity. The VIFs for all our variables, including the interaction terms, were significantly below 10, the most-commonly used threshold for collinearity (see, e.g. Belsley, Kuh, & Welsch, 2005; Hair et al., 2006; Neter, Kutner, Nachtsheim, & Wasserman, 1996). Variance inflation should thus not be an issue in our study.

With respect to our control variables, the regression results depicted in Table 3.2 underscore the correlation results depicted in Table 3.1. Specifically, Table 3.2 reveals a significant, positive relationship between company age and revenue but not between company age and revenue growth. Additionally, a positive relationship between new venture size and our dependent variables becomes obvious. Finally, our results suggest that service providers realize lower levels of revenue than other new ventures.

With respect to our hypotheses, our regression results provide confirming evidence for Hypothesis 1, stating that networking ability has a significant positive impact on new venture performance irrespective of the institutional context. First, Table 3.2 reveals a positive effect of networking ability on revenue in Models 2 to 5 as well as on revenue growth in Models 7 to 10. An additional split-sample analysis confirmed that this result is not predominantly driven by the German entrepreneurs. Specifically, the analysis of the Brazilian subsample revealed a significant, positive relationship between entrepreneurs' networking ability and new ventures' revenue ($\beta = .207$, $p < .05$), as well as new ventures' revenue growth ($\beta = .411$, $p < .05$).

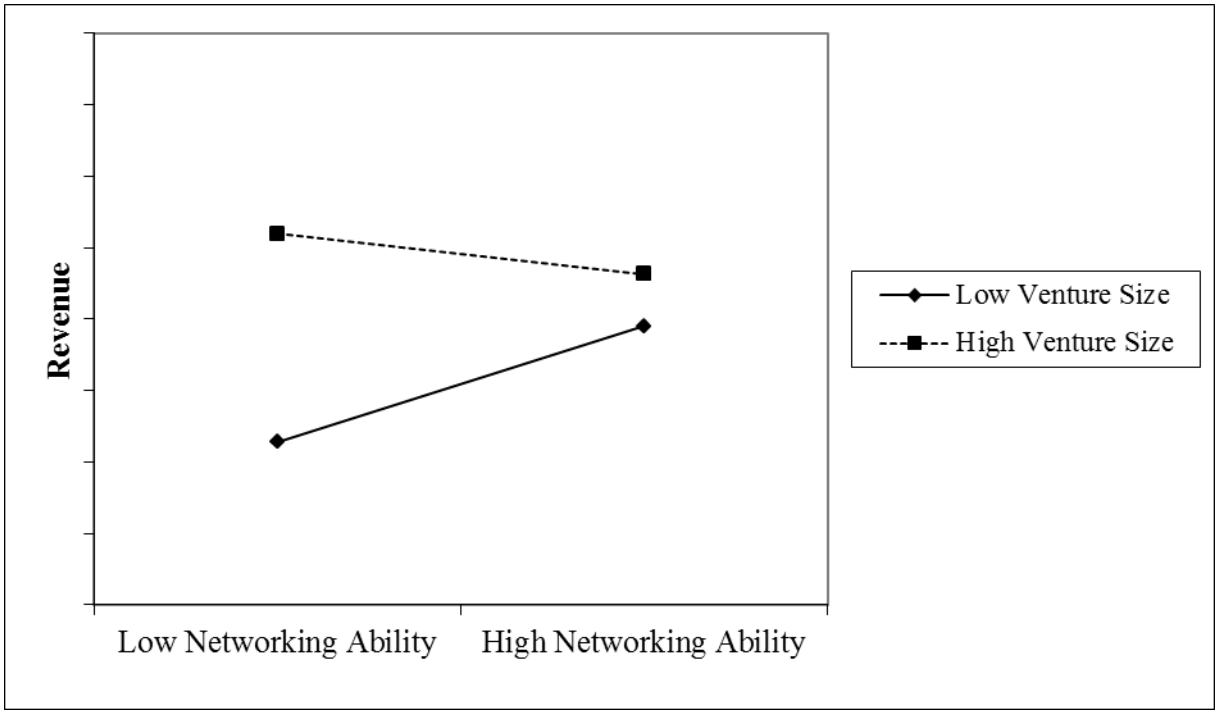
Table 3.2. Results of ierarchical Regression Analyses

N = 283	Revenue					Revenue Growth				
	Model 1	***Model 2***	***Model 3***	***Model 4***	***Model 5***	***Model 6***	***Model 7***	***Model 8***	***Model 9***	***Model 10***
Constant	11.578**	11.60**	11.592**	11.593**	11.613**	2.144**	2.162**	2.164**	2.164**	2.147**
Service provider	-.371*	-.427*	-.473**	-.485**	-.482**	.307	.256	.237	.189	.211
High-tech industry	-.116	-.118	-.057	-.052	-.069	.038	.040	.065	.084	.078
Company age	.515**	.537**	.474**	.468**	.481**	-.025	-.005	-.033	-.060	-.070
Inst. env. (Germany)	.476**	.540**	.642**	.644**	.658**	.217	.270	.314	.325	.330
Venture size	.509**	.482**	.953**	.962**	.618**	.180^{+}	.156	.357*	.402*	.417
Networking ability		.251**	.243**	.296*	.252*		.217*	.212*	.447*	.424*
Networking ability × Venture size			-.566**	-,578**	-.239			-.241	-.294^{+}	-.207
Networking ability × Inst. env.				-.085	-.045				-.377^{+}	.355
Venture size × Inst. env.					.568*					-.001
Networking ability × Venture size × Inst. env.					-.559**					-.147
R²	.321	.347	.413	.414	.431	.021	.035	.044	.054	.056
ΔR²		.026	.066	.001	.017		.014	.009	.010	.002
adjusted R²	.309	.333	.398	.397	.410	.003	.014	.020	.026	.021

$^{+}$ p < .10; * p < .05; ** p < .01

When entering the two-way interaction term to test for the negative moderating effect of new venture size, we also find confirming evidence for Hypothesis 2. In particular, Table 3.2 reveals a significant negative moderating impact of venture size on the relationship between networking ability and revenue (Model 3, β = -.566, p < .01), which is also depicted in the interaction diagram in Figure 3.1.

Figure 3.1. Moderating Impact of Venture Size



As shown in Figure 3.1, entrepreneurs' networking ability and their new ventures' revenue are clearly positively related for smaller ventures but not for larger ones. Underlining this result, Model 4 shows that the negative moderating effect of venture size persists (β = -.578, p < .01), even when we include the additional interaction term necessary for testing our subsequent hypothesis. Providing further support for our second hypothesis, a marginally significant negative moderating effect of venture size on the relationship between networking ability and revenue growth—which is narrowly missed in Model 8 (β = -.241, p = .11)—becomes evident when we control for the interaction between networking ability and institutional environment (Model 9, β = -.294, p < .10). To test for the stability of this result, we additionally re-estimated our models, employing the number of employees instead of the aggregated number of employees and founders as a measure for new venture size. The results of these additional analyses clearly support our findings.

In contrast, our data do not provide clear support for Hypothesis 3. Even though the interaction term between institutional environment and networking ability meets

the threshold for marginal significance in Model 9 (β = -.377, p < .10), we find no convincing evidence for the notion that the relationship between entrepreneurs' networking ability and a new venture's financial performance of is weaker in more-developed institutional contexts in general.

In contrast, our three-way interaction analysis provides significant support for Hypothesis 4, which proposed that the negative moderating effect of venture size on the relationship between entrepreneurs' networking ability and their new ventures' financial performance is significantly stronger in more-developed institutional contexts. Technically speaking, Hypothesis 4 thus implies a negative three-way-interaction among venture size, institutional environment, and entrepreneurs' networking ability, which we find clear evidence for in our data (Model 5, β = -.559, p < .01).

3.5. Discussion

This study aimed at extending previous research on the relationship between entrepreneurs' networking ability and a new venture's financial performance. Our results first of all provide evidence for the notion that entrepreneurs' networking ability is an individual-level skill relevant for the performance of new ventures in different institutional environments. This evidence confirms and extends earlier research showing that certain individual-level characteristics of entrepreneurs, such as self-commitment, self-efficacy, or dynamism are of relevance for entrepreneurial activity and success in various and diverse settings (Kiss, Danis, & Cavusgil, 2012). From a practical point of view, this result implies that irrespective of the quality of the institutional environment surrounding them, entrepreneurs should consider either including people with significant networking abilities into their founding team, and/or seeking assistance and training to improve their own networking abilities when trying to found and successfully operate a newly founded venture.

This insight, however, also offers some avenues for further research. In particular, we have to acknowledge that our data do not reflect whether the networking behavior and strategies that make some entrepreneurs better networkers than others are similar in different institutional contexts. In view of the fact that recent research presented by Batjargal (2010a), point out that some networking strategies, such as brokering between disconnected actors, might be accepted and successful in one context but even punished and unsuccessful in a different institutional environment, we explicitly want to encourage further research to help explain the kind of behavior and strategies that entrepreneurs who are highly skilled and successful in networking use in different national or institutional contexts.

Confirming our second hypothesis, our results show that the positive impact of networking ability on the financial performance of a new venture is moderated by its size. More specifically, our results suggest that the financial performance of smaller ventures tend to profit significantly more from the distinct networking ability of their entrepreneurs than does the financial performance of larger ventures. Providing evidence for our theoretical reasoning that ventures suffering from a liability of smallness benefit from entrepreneurs' networking ability, this result complements previous findings on the decreasing performance relevance of entrepreneurs' individual-level characteristics in the course of a new venture's development (Frank et al., 2007; Semrau & Sigmund, forthcoming). Considering that we control for venture age when testing for the moderating impact of venture size, our results additionally underscore previous research results showing that the effects of the liability of newness and smallness are conceptually and empirically distinct (Brüderl et al., 1992; Freeman et al., 1983).

With regard to our third hypothesis, which posits a general moderating effect of the institutional environment, we find no confirming evidence. As such, this finding clearly contradicts existing evidence for the notion that the ability to establish network ties may be more important for new ventures in less-developed institutional contexts than in fully developed ones (Danis, De Clercq, & Petricevic, 2011; Lee et al., 2001). At least partially, however, this contradiction may be resolved when also considering the results related to our fourth hypothesis, as well as the differences in the theoretical reasoning underlying both propositions. Specifically, when testing our fourth hypothesis, we found that whereas the impact of entrepreneurs' networking ability on the financial performance of new ventures largely decreases with venture size in a more-developed institutional environment, such an effect is not observable in the less-developed institutional context. Put differently, this finding suggests that whereas entrepreneurs' networking ability seems to be equally relevant across contexts that differ with respect to the developmental status of their institutions as long as a venture is small, this individual skill is relatively more important in less-developed institutional contexts for larger ventures.

From a theoretical point of view, this result may also be explained by the fact that irrespective of the institutional context, small ventures' resource exchange is predominantly based on network-relationships, whereas when the ventures grow market- and contract-based exchanges become more important (Hite & Hesterly, 2001; Schutjens & Stam, 2003). As a consequence, differences in institutional environments, which have an impact on contract enforceability and reliability, do not play a significant role for the relevance of entrepreneurs' networking ability as long as the venture is small, because entrepreneurs in less- as well as in more-developed institutional settings have to compensate for a lack of organizational legitimacy by

making use of their individual networking skills to develop the exchange relationships needed. Conversely, the question of whether a contract is more or less enforceable in a specific institutional environment seems to become much more relevant as a venture grows. Additionally, and in-line with empirical evidence showing that entrepreneurs in Germany should delegate network management responsibilities in the course of their new ventures' development to be more successful (Maurer & Ebers, 2006), a more-developed institutional environment seems to enable new ventures that have grown in size to become more and more independent from network relationships that are socially embedded and involve the entrepreneurs themselves. In contrast, our results indicate that even when already grown to a considerable size, new ventures in a context with a less-stable rule of law are much more dependent on entrepreneurs' engagement in developing and managing network relationships and connections to political actors.

From a practical point of view, this finding is particularly relevant for entrepreneurs who are thinking about internationalizing businesses that have reached a significant size. For them, our results imply that they have to carefully evaluate whether their personal networking abilities are needed in the international context they want to enter, and whether they want to personally engage more intensely in the process of developing contacts to exchange partners and political actors in the new environment when the institutional context is less developed.

Connected to this point, however, we clearly have to admit that our study is based on the data from just two different institutional contexts, which does not allow us to more specifically attribute the observed effects to particular differences in the institutional environment (Castrogiovanni, 1991). Consequently, we want to encourage further research to build on and extend our results by analyzing the question of how differences in institutional environments might explain the effects of entrepreneurs' networking ability—or other individual-level skills and attributes—in other institutional contexts and in more detail.

Before concluding, we have to note two other limitations of our study. Specifically, we have to acknowledge that our cross-sectional research design may raise the issue of causality. Even though the networking ability items we used have a timeline that supports the direction of influence proposed in our hypotheses, a clear causal interpretation of our results may remain problematic. In general, one could reverse the interpretation of the pertinent results to some extent and say that the existence of positive financial performance could lead to a self-perception of strong networking ability. However, there are several arguments against this interpretation. First, there are a number of studies with longitudinal designs showing that networking ability clearly predicts work outcomes (Ferris et al., 2005; Hochwarter et al., 2007). Additionally, previous research indicates that networking abilities are quite stable over

time (Treadway et al., 2007). Moreover, we also have to acknowledge as a limitation of our study that the data collections in Germany and Brazil were not conducted simultaneously, which may potentially have had an impact on our results. However, there only was a very small time lag between the two periods of data collection, which were both conducted in 2009. Additionally, all the items used to capture variables that are not time-invariant had a clear timeline referring to the end of 2008. Even though we are not able to completely rule out that the not-perfectly synchronized periods of data collection might have had an effect, we are confident that our results are not seriously biased.

3.6. Conclusion

The aim of this study was to extend previous research on the relationship between entrepreneurs' networking ability and a new venture's financial performance. In doing so, we shed more light on how venture size, differences in institutional environments, as well as the interplay of both variables affects the relationship between entrepreneurs' networking ability and new ventures' financial performance. The results of our analyses not only show a significant moderating effect of venture size but additionally emphasize that whereas the impact of entrepreneurs' networking ability on the financial performance of new ventures diminishes with venture size in a developed institutional environment, its relevance persists when the venture grows in a less-developed institutional context. Revealing this complex interaction between the individual, organizational, and environmental variables, our study makes a significant contribution to the literature, as it answers the calls for better contextualizing entrepreneurship research (Welter, 2011), and for shedding more light on how a combination of individual-level, organizational-level, and environmental variables may help to explain new venture performance (Korunka et al., 2003; Rauch & Frese, 2007).

Chapter 4

Identity-Based vs. Calculative Ties: A Comparative Analysis of Their Impact on New Venture Financial Performance

4.1. Introduction

New ventures' performance is at the core of entrepreneurship research (Gartner, 1985; Shane & Venkataraman, 2000; Venkataraman, 1997). Over the past decade, entrepreneurship research has made considerable progress in understanding the factors influencing this variable. One factor that figures prominently in this research area is new ventures' exchange networks (Street & Cameron, 2007). From an egocentric perspective, a venture's exchange network can be defined as the set of its exchange relationships that go beyond simple market exchange (Hite & Hesterly, 2001; Lee et al., 2001; Oczan & Eisenhardt, 2009).

A widespread approach in assessing the link between a new venture's exchange network and its performance is to examine the effects associated with network size. Indeed, many studies have found that, in general, the more extensive new ventures' exchange networks are, the more successful the ventures are in terms of financial performance (Hoang & Antoncic, 2003; Lavie, 2007; Singh, 2000; Slotte-Kock & Coviello, 2010). The rationale behind this effect is that founders are typically unable to succeed by relying solely on internal resources. Instead, they must also utilize the external support provided by network relationships to cope with their resource needs and achieve economic success (Davidsson & Honig, 2003; Jarillo, 1993; Stuart, Hoang, & Hybels, 1999).

Researchers have also argued, however, that the overall size of a new ventures' exchange network may hide other, more differentiated network characteristics that play an important role. In fact, Hite and Hesterly (2001) propose that different ties may fulfill different duties. Specifically, they argue that a new venture's identity-based exchange relationships, i.e. those based on entrepreneurs' social connections with family and friends, may be a valuable asset in early stages of a new ventures development; however, calculative exchange relationships, i.e. ties added to the new venture's exchange network after founding, must be established in the course of the new venture's development to ensure persistent growth.

Clear empirical evidence for this notion is, however, currently lacking. The only two studies to date that explicitly address the post-founding performance implications

of identity-based ties generate ambiguous results. Hansen (1995) concludes in his qualitative study that the number of identity-based ties is positively associated with new venture performance after founding. Lechner Dowling and Welpe (2006), on the other hand, found no effect of identity-based ties on new venture performance directly after founding and even a negative effect in subsequent years. Conversely, the authors show that ties with competitors, reputational ties, and marketing ties established after founding are positively related to new venture performance.

This study aims to resolve this ambiguity and to contribute to our understanding of the performance implications of different types of exchange ties by comparatively assessing the role of identity-based and calculative ties in different facets of new venture financial performance. To do so, I first develop detailed hypotheses regarding the performance implications of identity-based and calculative ties. Specifically, I argue that the different types of ties influence two distinct facets of new venture financial performance—initial financial performance and subsequent growth, respectively—which have been found to be only modestly correlated (see, for example, Chandler & Hanks, 1993; Combs et al., 2005; Murphy et al., 1996; Tosi et al., 2000).

The present study complements and extends previous findings on the relationship between exchange network characteristics and new venture financial performance. First, it offers empirical evidence supporting Hite and Hesterly's (2001) suggestion that identity-based ties and calculative ties fulfill different duties and clearly highlights the notion that entrepreneurs must change the composition of their exchange networks for their new ventures to grow. Second, it complements the findings of Hansen (1995) and Lechner et al. (2006) regarding the association between identity-based exchange relationships and new venture financial performance and sheds further light on how these effects may be explained. Finally, it bears clear practical implications for entrepreneurs.

This paper is organized as follows. In the next section, I present my theoretical reasoning and develop the hypotheses. I then describe the research method, present the results of the analysis, and discuss their implications. The paper closes with some remarks on the contribution and limitations of this study.

4.2. Theory

As expressed in the theoretical constructs of the liability of newness and the liability of smallness, new ventures are characterized by a lack of internal resources (Stinchcombe, 1965). Acquiring external resources by developing network exchange relationships is thus considered a crucial asset for new venture development and performance (Hite & Hesterly, 2001; Maurer & Ebers, 2006).

Addressing how exchange network characteristics affect new venture performance, a number of studies conclude that the number of network ties is positively associated with new venture financial performance. For instance, Lee and Tsang (2001) found that network size is positively related to new venture growth in sales and profit. Similarly, Zhao and Aram (1995) found that high-growth new ventures have significantly larger exchange networks than low-growth new ventures. The underlying argument of these studies is that larger networks hold a greater quantity and a greater variety of resources, which makes it more probable that the founder receives the resources needed.

However, others have argued that addressing the mere size of the exchange network may not sufficient and that a more fine-grained examination of the composition of the new ventures' exchange networks may provide further insights. Specifically, Hite and Hesterly (2001) argue that identity-based ties fulfill other duties than calculative ties.

To date, however, empirical research on network development is still underdeveloped (Lechner et al., 2006). Virtually no studies comparatively address the impact of these two types of ties. Thus, to address this gap, I will subsequently develop detailed hypotheses on how identity-based and calculative ties differ in terms of their influence on new venture financial performance. Specifically, I will derive why I expect identity-based ties to be related to the initial financial performance of a new venture, whereas adding calculative ties in the course of a new venture's development should have a stronger positive effect on subsequent growth in financial performance.

4.2.1. The Impact of Identity-Based Ties on Initial Financial Performance

As indicated above, it is widely recognized that entrepreneurs must rely on external support to obtain necessary resources when founding and developing a new venture (Davidsson & Honig, 2003; Jarillo, 1993; Stuart et al., 1999). Several studies provide evidence for the notion that identity-based ties may provide resources and, thus, have a positive effect on entrepreneurial success. Davidsson and Honig (2003), for example, provide empirical evidence for the notion that nascent entrepreneurs who are supported by more network ties based on personal relationships, such as relatives and friends, are more successful in advancing through the start-up process. Additionally, Hansen (1995) demonstrated in a qualitative study that the size of the identity-based exchange network has a positive effect on organizational performance. Based on these observations, I expect identity-based ties to impact new venture financial performance. However, I expect that such ties are primarily associated with new ventures' *initial* financial performance and are much less relevant for the ventures' subsequent financial performance growth.

When attempting to found a new venture, entrepreneurs are expected to rely on identity-based ties such as family members, friends, and existing business contacts to obtain access to critical resources such as financial capital, knowledge, and advice (Hoang & Antoncic, 2003; Starr & Macmillan, 1990). This is based on the fact that these ties are heavily socially embedded, meaning that interactions are not primarily economically motivated but rather based on personal relationships (Hite & Hesterly, 2001). Consequently, identity-based ties are likely to agree on being involved in an exchange relationship with a new venture and provide resources such as information, and knowledge, and financial capital on attractive terms (Coleman, 1990; Krackhardt, 1992), even when more distant exchange partners may refuse to do so. For example, an entrepreneur might gain access to financial capital from close friends or family even when acquaintances or potential business partners are unwilling to invest because the survival and success of the newly founded business is highly uncertain.

Moreover, relying on socially embedded exchange relationships may even be associated with a high level of exchange efficiency. Because exchange partners know each other well from the start of their collaboration, misunderstandings and conflicts are unlikely. This enables entrepreneurs to achieve superior initial performance (Uzzi, 1997; Davidsson and Honig, 2003).

In summary, I expect that new ventures with a greater number of identity-based exchange relationships are able to draw on a more extensive pool of external resources at attractive terms and, thus, should be able to achieve superior initial financial performance. Accordingly, I propose:

H1. *The number of identity-based ties brought into a new venture's network will positively influence the venture's initial financial performance.*

4.2.2. The Impact of Calculative Ties on Growth in Financial Performance

As indicated above, researchers have also shown that greater numbers of calculative exchange network ties also foster new venture performance (Lechner et al., 2006). However, as I argue below, I expect these calculative exchange ties to be primarily associated with new ventures' financial performance *growth*.

As described above, entrepreneurs in the early stages of the new venture development process may rely on external support from ties previously known. However, once a venture is fully operating, it evolves through different stages of development (Bhide, 1999; Churchill & Lewis, 1983) that are associated with different strategic contexts and varying resource needs (Aldrich & Reese, 1993; Quinn & Cameron, 1983). To meet these needs, it is not sufficient to simply rely on identity-

based exchange relationships (Hite & Hesterly, 2001; Lechner & Dowling, 2003; Maurer & Ebers, 2006), as identity-based exchange networks are typically densely constructed—thus, ties tend to control similar resources (Lechner et al., 2006). This subsequently restricts the diversity of resources available through these ties (Burt, 1992). As a result, entrepreneurs must adapt their exchange networks by establishing exchange relationships with new partners in order to successfully develop their business (Elfring & Hulsink, 2007; Hite, 2005; Lechner & Dowling, 2003; Witt, 2004). These newly established and purposefully functional calculative ties will more likely be able to provide access to the resources needed to face the challenges that evolve in the course of a new venture's development (Hite & Hesterly, 2001).

In line with this reasoning, I expect that, whereas identity-based ties are important for the initial financial performance of a new venture, calculative exchange ties established after the venture's founding will affect subsequent financial performance growth. I thus hypothesize:

H2. *The number of calculative ties established in the course of a new ventures development will have a positive impact on new ventures' financial performance growth.*

4.3. Method

To test the hypotheses on the comparative impact of identity-based and calculative ties on new ventures' initial performance and subsequent growth, I examined data on new ventures between one and three years of age. First, Semrau and Sigmund (forthcoming) have shown that the relevance of exchange network ties for new venture performance is particularly high up to a venture age of three years. Second, due to a lack of archival data on some variables necessary for the analyses, I had to rely on retrospective information provided by respondents. However, restricting the sample to new ventures between one and three years of age limited the length of the recall period to a maximum of three years, thus minimizing a possible recall bias (Gibson & Bonggeun, 2007).

To obtain a sufficiently large sample, I combined data on new ventures from two different data sets. The first data set was collected in 2009 via an online questionnaire. Institutions organizing business plan competitions and coordinating startup funds sent their alumni an electronic link to an online questionnaire. Of the completed responses, which have been used previously by Semrau and Sigmund (forthcoming) and Sigmund, Semrau, and Wegner (forthcoming), 71 new ventures met the age criterion and were thus appropriate for use in this study.

The second set of data was collected in 2010 also via an online questionnaire. Entrepreneurs currently participating in business incubators in Germany were invited to participate. To ensure a high response rate, entrepreneurs' contact information was obtained from the homepages of incubator organizations. Founders were then contacted by phone and, if willing to participate, sent an e-mail containing the link to the online questionnaire. A total of 408 founders accessed the questionnaire and 137 (33.6 %) completed it. Of these 137 respondents, 85 were involved in a new venture between one and three years of age.

Because response bias may be an issue in this study, I compared early respondents to late respondents in both data sets on several independent and dependent variables. Additionally, I tested for nonresponse bias by comparing the respondents who revealed their identity to respondents who did not. The presumption is that anonymous respondents more closely resemble nonrespondents (BarNir & Smith, 2002). In all comparisons, no significant differences were found.

I also examined whether the data was biased with respect to new-venture performance. To do so, I compared the average financial performance growth rates reported by respondents with the respective industry averages, which I obtained from the German Federal Statistical Office. The comparison revealed that, across industries, 42 percent of respondents reported a growth rate at or even below the industry standard. Given that growth rates of younger ventures are expected to be higher, on average, than the industry standard (Chandler & Hanks, 1993), I believe that my sample is not seriously biased in terms of performance.

To ensure that the sample was representative, I compared the sample to data from the German Socio-Economic Panel (SOEP). The SOEP is often used for research on German entrepreneurs, as it is a representative household panel survey conducted annually by the German Institute for Economic Research in Berlin (Caliendo et al., 2009; Mueller, 2006; Schäfer & Talavera, 2009). The comparison revealed a high degree of similarity between the entrepreneurs within the SOEP and the entrepreneurs in the joint sample. For instance, a relatively high percentage of male founders is reflected in the data from both the SOEP (69 percent) (Caliendo et al., 2009) and the current sample (66 percent). Likewise, the average level of entrepreneurs' education in the sample and the SOEP is quite high. Finally, the sample contains firms operating in many different industries, such as life sciences, information technology, chemical products, construction, food, and education, thus enhancing the representativeness of the current sample.

Because the data analyzed in this study is self-reported, I also tested for common method bias by employing Harman's one-factor test. The test revealed four distinct factors with an eigenvalue greater than one. The four factors accounted for 65 percent of the total variance, with the first factor explaining 21 percent of the variance

and no one factor accounting for most of it. Thus, I am confident that the data is not seriously biased. I further tested the validity of the data by comparing self-reports with available external sources of information. Information was available on the Internet for 74 companies that identified themselves during data collection. The correlations between the self-reported data and the information from the Internet regarding firm age, number of employees, and number of founding team members were all highly significant and ranged from $r = .97$ ($p < .01$, $N = 74$) for company age to $r = 1$ ($p < .01$, $N = 74$) for the number of founding team members. To ensure the validity of the financial performance measure used in this study, I followed Semrau and Sigmund (forthcoming). In Germany, small firms must be listed with the local chamber of commerce and in the commercial register when they meet certain criteria (Brüderl et al., 1992; Brüderl & Schüssler, 1990). Service companies must be listed if they achieve revenues of at least €75,000; and production companies if they realize revenues of at least €150,000. Making use of these criteria, I examined whether the ventures included in the dataset were listed. The result of this search showed that every company that should be listed according to the self-reported data was indeed listed and vice versa. Additionally, I searched three German firm databases—Hoppenstedt, Dafne and Creditreform—for revenue data on the firms included in the sample. As a result, I was able to compare the revenue data provided by 17 respondents with database entries and found the data to be highly correlated ($r = .96$; $p < .01$). In summary, I am confident that the financial performance data used in this study is of considerable validity.

4.3.1. Measures

4.3.1.1. Initial Financial Performance and Growth in Financial Performance

To capture new ventures' financial performance, I used three items that have been shown to be reliable and valid in prior research (Chandler & Hanks, 1993, 1998; Honig et al., 2006; Lee & Tsang, 2001). Specifically, I asked respondents to indicate in broad categories their current financial performance in terms of revenue, as well as accumulated revenue and profit growth for the last three years (or in comparison to the first 12 months of operation if the venture was younger than three years). I chose this scale format because it is considered helpful to overcome problems caused by unwillingness to disclose detailed financial information and also helps to address the problem that, even when business owners are willing to share financial performance data, the accuracy of their figures cannot be taken for granted (Zahra et al., 2002).

To assess revenue in the 2009 data set, 9 categories ranging from 1 (revenue up to 50 TEUR) to 9 (revenue of more than 10 MEUR) were used. To assess revenue and profit growth, respondents were asked to indicate their accumulated growth in seven

categories ranging from 1 (less than 5% growth) to 7 (more than 200% growth). In the 2010 data collection, similar but more differentiated items were used. The lowest answer categories of the three items were divided in three (revenue) and two (revenue and profit growth) additional categories, respectively. Consequently, 11 categories were used to capture revenue and 8 to measure revenue and profit growth. Before combining the two data sets, I thus merged the lowest categories for the financial performance items in the 2010 data set. I then divided the category means of the indicated growth rates by three (or company age if the company was younger than three years) to obtain comparable average growth rates. Because revenue growth and profit growth were highly correlated ($r = .85$, $p < .001$), I aggregated both items to a single measure reflecting growth in financial performance. I then constructed an indicator for new ventures' initial financial performance by reducing the category means of the current revenue by the cumulated revenue growth since the venture was founded. To correct for skewness, I conducted all analyses using the natural log of the performance measures (Yli-Renko et al., 2001).

4.3.1.2. Network Variables

The network data was collected according to an ego-centered perspective (Knoke & Yang, 2008; Wassermann & Faust, 1994). In line with Lechner et al. (2006), network exchange partners were defined as individuals outside the young enterprise who provide resources within an exchange relationship that goes beyond a simple market exchange.

To capture the number of identity-based and calculative ties within the new ventures' exchange networks, respondents in both data sets were asked to indicate the current number of exchange ties as well as the number of exchange partners with whom none of the founding team members was connected before the new venture was founded. The latter measure was used as an indicator for the number of *calculative exchange ties*. To capture the number of *identity-based ties*, i.e. ties based on social relationships, I computed the difference between the number of current ties and the number of calculative ties.

Because the number of identity-based ties reported for a new venture two or three years of age may not exactly represent the number of identity-based ties that the venture had in its first year of operation, I constructed a variety of measures to test for the stability of my results. Specifically, I made use of the fact that respondents in both data sets were also asked to indicate the number of the new ventures' exchange relationships that had been terminated since the new venture was founded. Because this measure does not differentiate between identity-based and calculative ties, I calculated three alternative sets of measures for identity-based and calculative ties by:

a) adding the number of terminated ties to the reported number of identity-based ties; b) adding the number of terminated ties to the reported number of calculative ties, and c) adding half of the terminated ties to the reported number of identity-based ties and half to the reported number of calculative ties. I then used all three measures to test the stability of the results.

4.3.1.3. Controls

I included several control variables in the analyses. The financial performance potential as well as the number of partners that can be managed by a new company may be influenced by the number of individuals involved in the new venture (Batjargal, 2006). Consequently, I controlled for the *number of founding team members* as well as the *number of employees (at founding)* and *employment growth.*

Since younger ventures typically have a smaller resource base (Stam & Elfring, 2008), which may influence their financial performance potential, I also controlled for *firm age*. Rosenkopf and Schilling (2007) demonstrate that exchange network structures may vary substantially across industries that differ in terms of technological dynamism and uncertainty. Accordingly, I included a dummy variable to indicate whether a firm belongs to a *high-tech industry*.

As research suggests that founders' intentions and attitudes are considered stable over time and might influence a new venture's performance, I also controlled for founders' *growth aspiration* (Delmar & Wiklund, 2008). Additionally, researchers have shown that the resource base that entrepreneurs can draw on is associated with new venture success (Baron & Tang, 2009). Accordingly, I also controlled for the ventures' resource scarcity.

Moreover, I controlled for the year in which data collection took place, as the two approaches differed considerably. Finally, I sequentially controlled for effects of the year in which the venture was founded and industry, such as life sciences, information technology, chemical products, construction, food, education, and clothing.

4.3.2. Analysis

I tested the hypotheses using hierarchical multiple regression analysis (Stam & Elfring, 2008). Computing the regression, I first entered the control variables before testing the competing effect of the identity-based and calculative ties. For all models, I computed the variance inflation factors (VIF) to exclude multicollinearity. The VIFs for all variables across all models were less than two. Even according to the strict threshold

of five favored by some authors (see, e.g. Menard, 2002), variance inflation was likely not an issue in this study.

4.4. Results

Table 4.1 displays the descriptive statistics and correlations for all variables analyzed in this study. The correlations between the main independent variables and the dependent variables were significant, which is in line with the hypotheses. Table 4.1 also shows that the extent to which entrepreneurs are involved in adding exchange relationships to their new ventures' networks in the course of its development is significantly, positively related to the size of the identity-based exchange network. This pattern is in line with Milanov and Fernhaber's (2009) finding that the size of the initial exchange network of a new venture is positively related to its size in subsequent periods. Furthermore, it seems noteworthy that a number of the controls included in the analysis positively relate to the dependent variables. First, there is a positive correlation between founders' growth aspiration and employment growth, thus supporting earlier results on the influence of founders' intentions (Delmar & Wiklund, 2008). Second, company age and firm size measures show the expected significant correlations with the dependent variables.

Table 4.1. Means, Standard Deviations, and Correlations

	N = 156	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	
1	Financial performance (in T€)	1												
2	Initial financial performance (in T€)	.782*	1											
3	Financial performance growth (in %)	.432*	.192*	1										
4	No. of identity-based ties	.319*	.250*	.181	1									
5	No. of calculative ties	.317*	.188	.282*	.385*	1								
6	No. of employees	.484*	.395*	.286	.061	.154	1							
7	No. of employees at founding	.245*	.264*	.063	.088	-.075	.420*	1						
8	Employment growth	.348*	.302*	.205*	.003	.234*	.693*	-.037	1					
9	No. of founders	.268*	.159*	.113	.194*	.011	.346*	.255*	.244*	1				
10	Company age	.322*	.209	.264*	-.013	.036	.136	.038	.095	.036	1			
11	High-Tech-Industry (Dummy)	.111	.078	.068	.165*	.201*	.066	.069	.116	.127	.100	1		
12	Resource scarcity	.181	.131	-.008	.285*	.270*	.051	-.050	.088	.054	-.098	.030	1	
13	Growth aspiration	.162*	.082	.103	-.013	.096	.132	.205*	.168*	.132	-.032	-.013	.199	1
	Means	88.967	56.114	57.694	.078	2.310	2.970	.7273	2.47	1.980	1.880	.621	3.880	5.41
	S.D.	175.67	125.96	79.253	1.775	4.765	5.008	2.121	5.099	1.242	.819	.486	2.260	1.900

* $p < .05$; two-tailed test

As depicted in Table 4.2, most of the effects of the control variables are also apparent in the regression analysis.

Table 4.2. Results of Hierarchical Regression Analyses

N = 156	**Initial financial performance**		**Financial performance growth**	
	Model 1	***Model 2***	***Model 3***	***Model 4***
Constant	.960**	.956**	.151	.158
Year of survey	-.342**	-.303**	-.001	-.143
High-tech industry	.011	.015	.030	.060
Growth aspiration	.060	.068	.038	.044
No. of founders	.074^{+}	.048	.021	.014
Resource scarcity	.137	.068	-.061	.061
No. of employees (at founding for model 1 + 2)	.244**	.241**	.200^{+}	.187^{+}
Company age			.254**	.243**
Employment growth			.030	.001
Identity-based ties		.189**		.124
Calculative ties		.054		.219**
ΔR^2	.106	.051	.137	.072
adjusted R^2	.103	.151	.096	.160

. $^{+}$ p < .10; * p < .05; ** p < .01

With regard to the hypotheses, Model 2 in Table 4.2 shows considerable support for Hypothesis 1, which predicted a positive effect of identity-based ties on new ventures' initial financial performance. Specifically, the observed effect of identity-based ties on initial performance is positive and significant ($\beta = .189$, $p < .01$, Model 2).

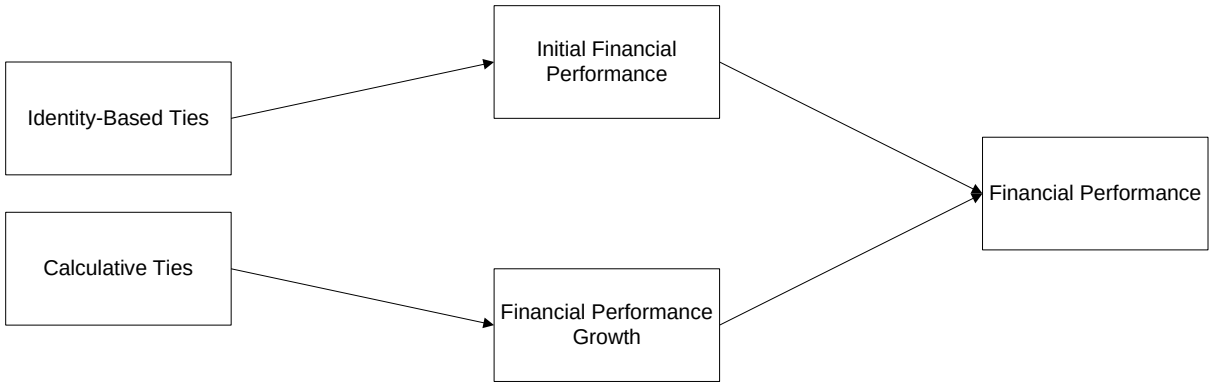
Hypothesis 2 predicted a positive effect of calculative ties on subsequent venture growth, which was also confirmed. Specifically, Model 4 in Table 4.2 shows that the number of calculative ties is positively and significantly associated with growth in new venture financial performance ($\beta = .219$, $p < .01$). However, as implied by my argumentation, there is no significant association between the number of identity-based ties and new venture financial growth ($\beta = .124$, $p = .46$).

To test the stability of the results, I re-estimated all models using the alternative measures for identity-based and calculative ties described above. The results of these analyses confirmed the results reported in Table 4.2. I also re-estimated the models

using split-samples comprising the data gathered in either 2009 or 2010 and again found the results confirmed.

To further assess the overall consistency of my argumentation, I estimated a mediated regression with new venture current financial performance as the dependent variable, identity-based and calculative ties as independent variables, and new venture initial financial performance and growth as mediators. As depicted in Figure 4.1, I tested: a) whether the direct effects of identity-based ties on new venture financial performance is mediated by their initial financial performance; and b) whether the direct effect of calculative ties on new venture financial performance is mediated by their growth in financial performance.

Figure 4.1. Tested Mediation Model



To test for these effects, I adopted the widely used procedure developed by Baron and Kenny (1986). According to their approach, a mediation effect is present if the following conditions are met: a) The independent variable is significantly related to the dependent variable and the mediator; b) the mediator significantly predicts the dependent variable; and c) the direct effect of the independent variable on the dependent variable is reduced when the mediating variable is added to the regression. A full mediation is indicated when the effect of the independent variable disappears when the mediator is added in the last step, whereas a reduction of the direct effect that leaves the effect significant would indicate a partial mediation.

Overall, the results of the mediation analysis, as depicted in Table 4.3, indicate that the effect of identity-based and calculative ties on new venture financial performance is indeed mediated by their initial financial performance and financial performance growth, respectively. First, as described above and shown in Model 2 in Table 4.1, the number of identity-based ties is positively associated with new venture initial financial performance ($\beta = .189$, $p < .01$) and the number of calculative ties is positively related to financial performance growth ($\beta = .219$, $p < .01$, Model 4).

Table 4.3. Results of Mediated Regression Analyses

N = 156	**Financial Performance**					
	Model 1	***Model 2***	***Model 3***	***Model 4***	***Model 5***	***Model 6***
Constant	.070	.070	.152*	.163*	.151*	.152*
Year of survey	-.341**	-.308**	-.149**	-.123**	.-345**	-.166**
High-tech industry	.026	.057	.007	.036	.047	.019
Growth aspiration	.110	.127*	.099*	.114*	.121*	.103*
No. of founders	.098	.067	.090	.081	.055	.086
Resource scarcity	.180	.080	.074	.033	.086	.039
No. of employees	.371**	.350**	.172^{+}	.151^{+}	.328*	.191^{+}
Company age	.304**	.297**	.103**	.180**	.243**	.109*
Employment growth	.002	.002	-.051	-.020	-.017	-.053
Identity-based ties		.223**		.094	.195**	.062
Calculative ties		.138**		.126**	.087	.078
Initial financial performance			.629**	.609**		.614**
Growth in financial performance			.265**		.231**	.232**
ΔR^2	.369	.079	.385	.251	.121	.389
adjusted R^2	.344	.418	.745	.716	.461	.752

$^{+}$ p < .10; * p < .05; ** p <.01

Furthermore, as shown in Model 2 in Table 4.3, the number of identity-based (β = .223, p < .01) and calculative ties (β = .138, p < .01) is positively related to new venture current financial performance. In sum, as required by the first step of the Baron and Kenny (1986) procedure, the independent variables are significantly related to both the proposed mediator and the dependent variable.

The second step requires that the proposed mediators are significantly related to the dependent variables. As shown in Model 3 in Table 4.3, this requirement is also met. Initial financial performance (β = .629, p < .01) and financial performance growth (β = .265, p < .01) are significantly related to a new venture current financial performance.

Finally, when the independent variables and the proposed mediators are simultaneously included in the regression, results indicate a full mediation. As shown in Model 4 in Table 4.3, entering initial financial performance into the regression eliminates the formerly significant effect of the number of identity-based ties on new venture financial performance (β is reduced from .223, p < .01, to .094, p = .65). As depicted in Model 5 in Table 4.3, the effect of calculative ties on new venture financial performance also disappears when financial performance growth is included in the regression (β is reduced from .138, p < .01, to .087, p = .43). As shown in Model 6 in Table 4.3, both results are also supported when tested simultaneously.

Summing up the mediation analyses reveals that identity-based and calculative ties do indeed influence different aspects of new venture financial performance, namely initial financial performance and financial performance growth, which constitute new ventures' current financial performance. Additionally, the mediation analysis reveals evidence for a sustaining effect of the number of identity-based ties on new venture financial performance. Specifically, the association between the number of identity-based ties and new venture financial performance remains significant even when controlling for financial performance growth, whereas the effect of calculative ties on financial performance disappears. This indicates that the effect of the identity-based ties on a new venture's initial financial performance persists even after the first year of operation.

4.5. Discussion

The current study aimed to extend previous findings regarding the relevance of new ventures' exchange network characteristics on performance. Specifically, it shed light on how two different types of network exchange relationships—identity-based ties, which stem from entrepreneurs' social relationships that existed before the new venture was

founded, and calculative ties, which involve new network contacts—affect new venture performance. To address this question, I formulated and tested hypotheses on how the two types of ties foster different aspects of a new venture financial performance—initial financial performance and subsequent financial performance growth.

Confirming the hypotheses, the results of this study provide empirical evidence for Hite and Hesterly's (2001) claim that: 1) identity-based relationships are a valuable asset in the state of organizational emergence, as they provide necessary resources when other potential network partners may hesitate to cooperate with the new venture; and 2) the development of more calculative ties, which are not embedded in social relationships, is necessary to provide a greater breadth of resources and foster a new venture's subsequent performance growth.

Additionally, the current study complements and extends previous qualitative research conducted by Hansen (1995), which showed that identity-based ties are positively associated with new venture financial performance in the first year of operation.

By shedding light on the specific advantages of identity-based and calculative ties, the current study also underscores the results of Lechner et al. (2006), who found that different types of ties, such as social ties, marketing ties, reputational ties, and ties with competitors exert their influence at different points in a new venture's development. However, the authors also report a negative effect of identity-based ties on new venture performance after the first two years of operation. In contrast to this result, the current findings suggest a positive effect of identity-based ties on new venture financial performance even through the third year of operation, which is due to its positive effect on new venture initial financial performance. To some extent, this difference may potentially be explained by sample differences. Whereas Lechner et al.'s (2006) results are based on a sample of venture-capital-backed ventures, the data examined in this study comprises ventures that are not venture-capital-backed. Given that recent research found that venture capitalists are not only providing financial resources but also often act as coaches and consultants, thus substituting for other sources of information and knowledge (Colombo & Grilli, 2010), the presence of venture capital support may have an impact on the relevance of identity-based ties. Specifically, it is possible that the benefits of maintaining identity-based ties, which in the course of a new venture's development may primarily provide information and knowledge as well as emotional support, are less relevant when a venture capitalist is providing guidance. Consequently, maintaining these ties may even have a negative effect, as it may lead to network overload without providing additional benefits. However, considering that this reasoning is largely speculative, I would like to

encourage future research to examine in more detail the longer-term performance relevance of identity-based ties.

In light of the current findings, the current study makes a significant contribution to the literature: To the best of my knowledge, it is one of the first studies to simultaneously assess the implications of identity-based and calculative ties on different aspects of new venture financial performance. It thus contributes to the literature on network development, which is still underdeveloped (Lechner et al., 2006), by clearly highlighting the notion that entrepreneurs must change the composition of their networks for their venture to grow. By demonstrating that different types of ties may have quite different implications for a new venture's financial performance, this study also contributes to the field of applied network research. Particularly, it clearly shows that more fine-grained analyses are needed to enhance our understanding of the relationship between network characteristics and success.

These findings also offer some practical implications for entrepreneurs. Specifically, they imply that, whereas founders may rely on social connections such as friends and family in order to successfully establish a new venture, they might have to focus on developing new and more strategically selected relationships in order to succeed in subsequent venture development.

4.6. Limitations

In addition to the limitations associated with the use of self-reported data, which I addressed in the method section, I would like to acknowledge the limitation of the cross-sectional research design, which implies that a clear causal interpretation of my results is not possible. One could thus potentially reverse the interpretation of the findings and conclude that a high level of initial financial performance may increase the number of identity-based partners that enter a network resource exchange with the new ventures, and that a high growth rate allows entrepreneurs to develop more new and strategically oriented network relationships. Assuming that this reversed-causality holds true, however, one must also expect new ventures with a superior initial financial performance to be better able to establish strategically motivated calculated network ties, which is not reflected in the data.

Another limitation of the study at hand that should be addressed by further research is related to the distinction between identity-based and calculative ties. Even though the distinction is more fine-grained than the widely used network size variable, research that is even more detailed may be necessary to further disentangle the performance effects of

different network constellations. For example, it may be fruitful to combine the approach of distinguishing between identity-based and calculative ties with an explicit consideration of how the strength of these relationships varies over time as well as whether there may be a complementary relationship of both network variables with regard to success.

Chapter 5

Exploration and Exploitation in Network Development: How Ambidexterity affects New Ventures' Financial Performance

5.1. Introduction

A still growing body of research suggests that network relationships are important for founding and developing new ventures, as they provide access to needed resources (Greve & Salaff, 2003; Street & Cameron, 2007). Building on this fundamental premise, the majority of studies in the field has so far focussed on how structural and relational features of entrepreneurs' networks impact new venture survival, growth, and performance (Hoang & Antoncic, 2003; Street & Cameron, 2007). There has been comparatively less research, however, on how the dynamics of new ventures' exchange networks affect their performance (Jack, 2010; Slotte-Kock & Coviello, 2010).

This is particularly surprising for two reasons: First, entrepreneurship research has noted that new ventures' resource requirements change across their development stages (Hite & Hesterly, 2001; Kazanjian, 1988) and a few qualitative case-based studies have highlighted how new ventures develop their networks over time in order to adapt to changing resource needs (e.g. Larson & Starr, 1993; Maurer & Ebers, 2006). Second, alliance research among established ventures indicates that the ratio of being engaged in developing new network relationships to relying on existing ones impacts firm performance.

In order to contribute to extending knowledge on the dynamics of new ventures' networks and pertinent performance implications, the study at hand builds on these two aforementioned streams of research. First, we develop theoretical arguments outlining why new ventures can profit from exploration in network development (denoting the utilization of new network exchange relationships), on the one hand, and exploitation in network development (denoting the utilization of existing network ties), on the other. Second, we hypothesize that new ventures achieve superior financial performance when they realize ambidexterity in network development, i.e. when they engage in both explorative and exploitative activities. When testing our hypotheses with longitudinal data from the Panel Study of Entrepreneurial Dynamics II (PSED II), we find broad

confirming evidence for our propositions. Specifically, we find that new ventures profit from concurrently engaging in exploration and exploitation in their network development and achieve superior financial performance when balancing both activities evenly.

These findings contribute to the extant literature by providing initial empirical evidence based on a large-scale longitudinal data set for how different ways of developing new ventures' exchange relationships (exploration, exploitation and ambidexterity) over time affect firm performance. The study contributes to network theory in entrepreneurship by introducing the logic of ambidexterity to the domain of new ventures' networks. These insights, which also have clear practical implications for entrepreneurs, contribute to answering a key question concerning the relationship between network dynamics and new venture performance (Jack, 2010; Slotte-Kock & Coviello, 2010) and highlight how new ventures network have to be developed to suit the evolving needs and conditions of new venture evolvement over time. Additionally, our results also enrich the literature on ambidexterity in the domain of inter-organizational relationships, which so far lacks research on the early stages of firm development.

5.2. Theory and Hypotheses

An important stream in entrepreneurship research emphasizes the significance of a new venture's exchange network for successful firm development (Hoang & Antoncic, 2003; Street & Cameron, 2007). In particular, it highlights that new ventures' networks—defined as the set of active exchange relationships that go beyond simple market exchange (Hite & Hesterly, 2001; Lee et al., 2001)—provide access to necessary resources on attractive terms and thus enable entrepreneurs to compensate for existing resource deficits. So far, however, research following the network perspective in entrepreneurship has mainly taken a comparative static view on the implications of networks characteristics for new venture performance. For example, a considerable number of studies have shown that structural network characteristics, such as the number of new ventures' network relationships, have a positive impact on the financial performance of new ventures (Hansen, 1995; Lee & Tsang, 2001; Raz & Gloor, 2007).

Complementing this comparative static view on different structural and relational features of entrepreneurial networks and their performance implications, scholars have also pointed out the importance of network development for new ventures. Hite and Hesterly (2001) submit that entrepreneurs have to develop new network relationships in the course of their venture's further development to adapt to changing resource needs. Relatedly, Elfring and Hulsink (2007) emphasize that changing the composition of a new

venture's network is key to increasing performance over time. So far, however, only a few case studies have empirically investigated these claims. Based on a case study analysis of ten firms in different stages of firm development, Lechner and Dowling (2003), for example, present some confirming evidence for the notion that the composition of a new venture's network needs to change over time, as the importance of different resources and corresponding network ties varies across different stages of firm development. Similarly, a comparative case-study of biotechnology firms conducted by Maurer and Ebers (2006) shows that firms realize performance benefits when they repeatedly adapt the composition of their network according to changing resource demands resulting from an evolving internal and external task environment.

Analyzing a large-scale longitudinal data set, the present study extends this prior research by shedding more light on how different network development activities of new ventures impact financial performance. Specifically, we theorize and test empirically how exploration and exploitation in developing new ventures' networks as well as the ambidextrous engagement in both activities affect the financial performance of new ventures.

5.2.1. Exploration and Exploitation in New Ventures' Network Development

In general, the notion of exploration refers to activities involving "search, variation, risk taking, experimentation, play, flexibility, discovery, innovation" (March, 1991, p. 71), while exploitative activities are defined as including "refinement, choice, production, efficiency, selection, implementation, execution" (March, 1991, p. 71). Originating in March's (1991) seminal article on organizational learning, the duality of exploration and exploitation has received considerable attention in various contexts of management research, such as knowledge and innovation management, organization design, and inter-organizational relations (Lavie, Stettner, & Tushman, 2010).

In the context of research on firms' inter-organizational relations, it has been regarded as a form of exploration when firms form new relationships with new partners, while utilizing relationships with existing partners has been considered a form of exploitation (Lin, Haibin, & Demirkan, 2007). When firms form new relationships with new partners they engage in a form of exploration, because in this way they expand their knowledge and access to resources through new network partners. Moreover, in line with March's (1991) notion of exploration, firms thus not only enhance their opportunities but also increase risk and uncertainty because they cannot rely on prior experience with their new partners. Forming relationships with existing partners is a form of exploitation, as

firms extend their existing knowledge base with a select group of partners with whom they have established ties for accessing resources. In line with March's (1991) notion of exploitation, retained relations not only foster mutual learning but also advance execution and efficiency of the exchange relation, as the partnering firms over time develop trust and engage in joint problem-solving (McEvily & Marcus, 2005).

A fundamental question raised by theorists in the field of inter-organizational research is how exploration and exploitation as well as their interplay affect firm performance (Beckman, Haunschild, & Phillips, 2004). Perhaps surprisingly, however, there has been little research that empirically examined these questions (Lavie et al., 2010). While a few studies focused on exploration and exploitation in alliance networks of established firms (Lavie, Kang, & Rosenkopf, 2011; Lin et al., 2007), there still is a dearth of knowledge about how exploration, exploitation and ambidexterity play out in early stages of firm development. By addressing the financial performance implications of exploration and exploitation in new venture's network development as well as the effects of balancing these activities, the present study thus not only contributes to enhancing our knowledge in the field of entrepreneurial networks but also closes a gap in the wider literature on exploration, exploitation and ambidexterity in inter-organizational relationships.

5.2.2. Exploration and Exploitation in Network Development and New Ventures' Financial Performance

When starting a new venture, entrepreneurs are usually able to rely on a network of social relationships, such as family members, friends and existing business relations, that is widely recognized as "their most valuable asset" (Hite & Hesterly, 2001, p. 278, p. 11) or "the entrance ticket for a start-up" (Lechner & Dowling, 2003), as it provides resources critical for founding a new business (Starr & Macmillan, 1990).

As described by many process theories in the field, new ventures however face different challenges at different stages of their development (Churchill & Lewis, 1983; Greiner, 1972; Kazanjian, 1988). Correspondingly, their resource needs change over time (Elfring & Hulsink, 2007; Hite & Hesterly, 2001). Even though the network relationships existing at new venture formation is extremely valuable for the emergence of a new venture, it is usually not able to provide over time all the resources necessary for successfully further developing the new business venture, such as industry and marketing knowledge or additional financial capital (Hite & Hesterly, 2001; Lechner & Dowling, 2003; Lechner et al., 2006; Maurer & Ebers, 2006). As new ventures continuously face new challenges and opportunities in the course of their development, they thus need to

continuously engage in exploration activities in terms of developing new exchange relationships in order to be able to access the resources required for meeting novel challenges and opportunities.

In line with this reasoning, we expect new ventures to profit when they adapt the composition of their networks by developing new network relationships. Accordingly, we propose:

H1. *New ventures that engage in network exploration, i.e. change the composition of their networks by establishing new exchange relationships, are more successful than new ventures that refrain from network exploration.*

Notwithstanding the benefits of network exploration, we also expect new ventures to profit from network exploitation, i.e. from continuing existing exchange relationships. Reliance on existing network ties provides several advantages over the establishment of new ones. First, existing exchange ties do not incur the cost of searching for new and appropriate partners (Goerzen, 2007). By foregoing the development of new exchange relations with new partners, new ventures save effort and resources that they can profitably invest in their core business instead. Second, longer-term exchange partners often grant access to their resources at much more attractive terms, as the exchange parties develop expectations of continuity and a level of mutual trust (Poppo, Zhou, & Ryu, 2008). Finally, interactions and resource exchanges with existing partners are more efficient than with new partners. This is because existing relationships have already moved through an initial period of trial-and-error learning (Bouty, 2000; Krackhardt, 1992; Larson, 1992) and through repeated interaction the exchange partners have already developed similar stocks of knowledge, shared modes of understanding, and heuristics (McFadyen & Cannella Jr, 2004; Uzzi, 1997). These features ease joint problem-solving (McEvily & Marcus, 2005) and enhance the efficiency of collaboration and resource exchange (Podolny, 1994).

Considering these arguments, we submit that—irrespective of the benefits associated with developing new exchange relationships—new ventures should also benefit from continuously relying on existing exchange relationships. We thus propose:

H2. *New ventures that engage in network exploitation, i.e. continue to rely on existing exchange relationships, are more successful in terms of their financial performance than new ventures that refrain from network exploitation.*

5.2.3. Ambidexterity in Network Exploration and Exploitation

Even though the above two hypotheses are not mutually exclusive, because a new venture can both maintain some of its established exchange relationships and complement these with new network ties, one has to take into account that both activities are competing for scarce resources so that more exploration usually implies less exploitation, and vice versa.

The time and energy entrepreneurs can spend on managing their network is limited (Batjargal, 2006; Elfring & Hulsink, 2007), as it takes significant time and energy to develop new network relationships as well as to engage in network exploitation in terms of maintaining existing ties (Ebers & Grandori, 1997; Witt, 2004). Entrepreneurs are thus faced with a trade-off. When they invest their time and energy in network exploration this will come at the expense of network exploitation, as existing relationships have to be severed. Conversely, entrepreneurs engaging in more network exploitation by nurturing their existing ties will have to cut back on their exploration activities, i.e. their search for and establishment of new relationships. This consequently raises the question whether new ventures that solely engage in either exploration or exploitation are more successful or, rather, ventures that realize ambitexterity in network development, i.e. engage in both these ways of developing their exchange relationships.

In pondering this question, one has to take two particularities of new ventures into account. First, and as has been outlined above, new ventures in the course of their development, from firm emergence through early growth and beyond, face changing resource needs (Hite & Hesterly, 2001; Quinn & Cameron, 1983). Second, new ventures commonly suffer from the liabilities of newness and smallness, and are usually resource poor (Hite & Hesterly, 2001; Jarillo, 1989). It follows that they are often unable directly to reciprocate in network exchanges and have to get access to needed resources on the most favorable terms possible. In view of these circumstances, we expect that new ventures fare comparatively better in terms of their financial performance when they realize ambidexterity in network development for the following reasons:

First, reliance on network exploitation without some degree of network exploration over time will often starve a new venture of access to resources needed to master the new challenges emerging in the process of a new venture's development, as the existing

network will not be able to fulfill changing resource needs either qualitatively or quantitatively (Lechner & Dowling, 2003).

Second, reliance on network exploration without some degree of network exploitation over time will also produce inferior returns. Even though the resource needs of a new venture evolve over time and existing network ties may decrease in importance, not all of them become irrelevant. As noted by Schutjens and Stam (2003), even the social ties that existed before a new venture was founded can still be of considerable value in later stages of a new venture's development, as they may provide important information about business opportunities and are a relevant source for sales relationships. Similarly, Lechner and Dowling (2003) outline that some network relationships that are usually established after a new venture is founded, such as ties with competitors that improve a new venture's virtual resource base while at the same time retaining its flexibility, are important at all stages of a venture's development. Moreover, longer-term relationships grant access to resources on more favourable terms, due to their higher relationship quality and mutual trust in the partners' goodwill. New ventures throughout their development can thus profit from continuing to rely on existing exchange relationships, because these relationships provide new ventures with cost efficient access to resources that are needed continually.

Third, network exploitation may also constitute an important precondition for network exploration. The continuous access to resources provided by existing partners and the efficiency of exchanges with these existing partners enhances the appeal of a new venture for new partners, as it signals continuity, reliability, trustful relations, and efficiency (Milanov & Fernhaber, 2009; Zimmerman & Zeitz, 2002). The existing partner network thus constitutes an important symbol of legitimacy that affects whether or not new partners will invest in a relationship (Higgins & Gulati, 2003). Therefore, without some degree of continuity in existing partners, new ventures will face difficulties in attracting new partners who can provide needed resources.

In view of these arguments, we conclude that ventures will suffer in their performance when they only focus on exploitation to the exclusion of exploration or on exploration to the exclusion of exploitation. Rather, we submit that realizing ambidexterity in network development, i.e. engaging in network exploration and exploitation, will yield superior economic performance due to the complementarity of these strategies (Lavie et al., 2010; March, 1991) in generating value for new ventures. We accordingly propose:

H3. *New ventures that engage in ambidextrous network development, i.e. realize a mixture between developing new and relying on existing network exchange relationships, are comparatively more successful in terms of their financial performance than new ventures that either engage only in exploration or exploitation.*

5.3. Method

We tested our hypotheses on the basis of the PSED II data set. As the PSED II research design, data collection, and sample statistics are described in great detail in Reynolds (2011), we only provide a brief overview. The PSED II data set is publicly available and comprises longitudinal data on a representative sample of US entrepreneurs and their young ventures in different stages of the entrepreneurial process. To collect the data, a total of 1214 adults who engaged in starting up a new venture were identified in a screener telephone survey conducted between October 2005 and January 2006. After the screener, the individuals classified as (nascent) entrepreneurs were interviewed for the first time. Subsequently, four annual follow-up telephone interviews were conducted. By 2011, the data set thus contains 5 waves (Wave A to Wave E).

To analyze how network exploration and exploitation affect the financial performance of new ventures, we restricted the PSED II sample to the data of individuals who established a new venture. As our study focuses on how exploration and exploitation as well as their mix affect the performance of new ventures, we additionally excluded all those entrepreneurs from our analysis who reported to not relying on network relationships at all, i.e. in all five waves of our sample. As a result, we based our analyses on a sub-sample of the PSED II data set comprising 1269 observations.

About 37% of the entrepreneurs in our sample are female, their age ranged from 18 to 75 and up, with a mean of 44.7 years. 78% of respondents have at least some college education. The average prior industry experience of the entrepreneurs in our sample is 9.33 years and ranges from 0 to 48 years. The new ventures are operating in a wide range of different industries. The most often reported are: the construction industry, the manufacturing of signs and musical instruments, clothing, cosmetics, food services, real estate, computer systems, consulting, and educational services.

5.3.1 Measures

5.3.1.1. New Venture Financial Performance

To capture a new ventures' financial performance, we relied on respondents' information on whether their monthly revenue exceeded monthly expenses for more than six of the past twelve months (Reynolds, 2011). The measure takes the value of one for profitable periods and zero otherwise.

5.3.1.2. Exploration and Exploitation in Network Development

To capture the variables related to new ventures' networks, we followed previous studies using PSED data (Aldrich & Carter, 2004; Newbert & Tornikoski, 2010) and relied on measures indicating the number of "helpers" reported by entrepreneurs for each wave of panel data. A "helper" is defined as a person who does not have an ownership share but makes a distinctive contribution to the new venture, such as providing financial resources, materials, training, or business services. To capture *exploration* in network development independently of network size, we constructed a dummy variable taking the value of 1 when an entrepreneur reported having a new helper, i.e. a helper who had not been reported in the preceding wave, and zero otherwise. Similarly, we constructed a dummy for *exploitation* in network development that takes the value of 1 for each period in which the entrepreneur relied on at least one exchange relationship with a helper that had already existed in the preceding wave, and zero otherwise.

5.3.1.3. Ambidexterity in Network Development

To test for our third hypotheses, we constructed two different measures reflecting the relative extent to which a new venture is engaged in exploration and exploitation in network development. When operationalizing *ambidexterity* as a continuum between solely being engaged in network exploration on the one hand and network exploitation on the other, we took into account that both activities compete for scarce network management resources (Lavie et al., 2010; Perretti & Negro, 2006). Following earlier studies in the field of established ventures (Cao, Gedajlovic, & Zhang, 2009; He & Wong, 2004), our first measure for ambidexterity is based on the difference between network exploration and network exploitation. Specifically, we subtracted the number of maintained network relationships from the number of new network ties for every venture in each wave. This measure takes a value of 0 when the numbers of new and maintained helpers are equal. It is positive, when exploration exceeds exploitation and negative when

the new venture engages more in network exploitation than in exploration. To test for the proposed positive effect of ambidexterity in network development we included the measure and its squared term in the equation.

As an alternative measure reflecting *ambidexterity in network development* that allowed us to test the robustness of our findings, we *weighted* the absolute value of the above described difference between the number of new network ties and the number of maintained network ties for every venture in each wave with the total network size in the given period. Thus, the measure takes any value between 0 and 1. Specifically, it takes the value of 0 for every period in which the entrepreneur equally balances exploration and exploitation in network development and the value of 1 in every period she or he exlusively focuses on network exploration or exploitation. In order to further assess the robustness of our results, we constructed a third measure for *ambidexterity in network development* by employing a *Herfindahl-Index* (Hirschman, 1964; Jacquemin & Berry, 1979). Specifically, we constructed an index $(x_1/x)^2 + (x_2/x)^2$, with x_1 representing entrepreneurs' engagement in explorative and x_2 in exploitative network development in any given period. The index takes the value of 1 for every period in which an entrepreneurs is completely engaged in exploration or exploitation, and .5 if the two activities are equally balanced.

However, for periods in which the entrepreneurs reported to not having a network tie, we assigend a missing value to all of our ambidexterity measures, which resulted in a drop of observations when testing our hypothesis 3.

As there is consistent criticism against the reliability of difference measures, which is based on the fact that positively correlated component variables significantly decrease the reliability of difference measures (Cronbach & Furby, 1970; Linn & Slinde, 1977), we checked for the correlation between the number of new network ties and the number of maintained network relationships. As they turned out to be only weakly correlated (r = .153, $p < .01$), the reliability our difference measure for ambidexterity in network development seems to be quite accetable (Bergh & Fairbank, 2002; Tisak & Smith, 1994).

5.3.1.6. Controls

We included several control variables in our analysis. On an individual level, we first included *gender* for two reasons: First, men and women tend to differ with respect to their network and networking behavior (Moore, 1990; Renzulli, Aldrich, & Moody, 2000). Second, research has shown some evidence for gender-specific barriers to entrepreneurial success (Murphy, Kickul, Barbosa, & Titus, 2007). We also added the *age of the*

entrepreneur as a control to our analysis, because younger and older entrepreneurs likely differ in terms of the resource base they have available, which may influence the performance of their ventures (Parker, 2004). We decided also to include the *level of education,* as general human capital has been shown to influence the success of new ventures (Samuelsson & Davidsson, 2009). As Delmar and Shane (2006) demonstrate that the *industry experience* of an entrepreneur may influence the performance of his or her new venture, we furthermore controlled for the number of years the founder worked in the industry in which his or her new venture operates.

We additionally controlled for several firm-level variables. Recognizing that the PSED II data set comprises independent and dependent new ventures, a characteristic that might influence ventures' financial performance (Matthews, Schenkel, Ford, & Human, 2009) and their need for (additional) external support (Matthews et al., 2009), we controlled for the *independence of the venture*. Additionally, we controlled for the *number of employees* of the new venture for two reasons. First, a new venture's performance is likely influenced by the number of employees (and vice versa). Second, a new venture may develop competencies by means of hiring employees, which may, at least to some extent, be a substitute for relying on network exchange relationships (Colombo et al., 2006; Larson, 1992; Oliver, 1990). Furthermore, we included the *number of founders* as a control, because the size of the founding team may influence the capacity to develop and manage network exchange relationships (Batjargal, 2006). We incorporated a dummy variable to indicate whether a firm belongs to a *high-tech industry* for two reasons: First, Rosenkopf and Schilling (2007) as well as Schutjens and Stam (2003) demonstrate that new venture's networks may vary substantially across industries that differ in terms of technological dynamism and uncertainty. Second, Swaminathan (1996) found that these environmental factors might influence the success of a new venture.

Given that our study focuses on how the relative magnitude of network exploration and exploitation affect new ventures' financial performance, we isolated this effect from the widely recognized effect of the *size of new ventures' networks* (Hansen, 1995; Lee & Tsang, 2001; Raz & Gloor, 2007), by controlling for the number of helpers in any given period.

5.3.2. Analytical Approach

To test our hypotheses, we employed logistic random-effects estimation. We chose this approach for several reasons. First, it is appropriate for estimating binary response models, which is relevant for our analysis as our dependent variable is binary in nature. Second, in contrast to classic logistic regression analysis, logistic random-effects

regression not only accounts for between-group variance, i.e. the systematic differences between our new ventures at the same point in time, but also for within-group variance, e.g. the variation of a new venture's network development over time (Tabanick & Fidell, 2007; Wooldridge, 2002). As PSED II contains both types of variance with regard to the study variables, the use of logistic random-effects regression seems appropriate in the context of our study. We further established that logistic random-effects is the most efficient estimation technique for our analysis by comparing its results to the results generated by logistic fixed-effects models by means of a Hausman test for significant differences (Hausman, 1978; Stuart & Sorensen, 2007).

As the PSED II data are based on self-reports, they may potentially be biased. Even though a large number of earlier publications rely on the PSED data set (see Reynolds, 2007) and there is broad evidence that gives support for the reliability and validity of self-reported measures, not only in entrepreneurship research (Brush & Vanderwerf, 1992; Lechner et al., 2006; Peng & Luo, 2000), we thus conducted Harman's one-factor test for the presence of common method bias. Our analyses extracted six distinct factors with an eigenvalue greater than 1, which together accounted for 62 percent of the total variance. With the first factor accounting for only 15 percent of the variance, we are confident that common method bias is not a serious issue in our study.

To control for survivorship bias in terms of the unobserved heterogeneity that may affect firms' probability of being in our sample and their performance, we adapted a typical Heckman two-step procedure commonly used in empirical studies based on longtitudinal data (Delmar & Shane, 2006). Specifically, we first estimated a probit model on firm exit during the 5 waves of observation. The independent variables of this sample selection model include variables that measure founders' characteristics (age, gender, marital status, education, prior industry experience), firm-specific characteristics (firm size and age, dependence on a parental organization, number of founders), and other independent variables (network size, network exploration and exploitaion, network ambidexterity, evironmental dynamism, obtained government loan, purchased venture). Based on these estimates, we then computed the inverse Mill's ratio for all firms included in our sample and inserted it as a control in our equations.

5.4. Results

Means, standard deviations and correlations for our variables are shown in Table 5.1.

Table 5.1. Means, Standard Deviations and Correlations

		Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1.	New ventures' financial performance	.25	.43	1														
2.	Network exploration	.11	.30	.02	1													
3.	Network exploitation	.51	.49	-.02	.16*	1												
4.	Network ambidexterity	-1.12	2.23	.03	.17*	-.94*	1											
5.	Herfindahl ambidexterity	.94	.14	-.008	-.56*	-.08*	-.12*	1										
6.	Weighted ambidexterity	.91	.24	-.012	-.52*	-.04	-.15*	.98*	1									
7.	Network size	1.50	2.47	-.01	.45*	.95*	-.79*	-.28*	-.22*	1								
8.	Prior industry experience	9.33	10.6	.02	.01	-.01	.01	-.01	-.01	.01	1							
9.	Gender	.37	.48	.01	.02	.01	-.01	-.01	.01	.02	-.10*	1						
10.	Age of founder	44.70	2.59	-.01	.02	.04^{+}	-.03	.01	.02	.04^{+}	.37*	.07*	1					
11	Level of education	4.84	1.53	.08*	.04*	-.00	.01	.01	.01	.01	.14*	.10*	.21*	1				
12.	Independent venture	.69	.46	.02	-.04^{+}	.00	-.02	.02	.02	-.00	-.07*	.06*	.05*	.01	1			
13.	No. of employees	1.07	5.68	.07*	-.01	.01	-.01	.02	.01	.00	-.01	-.02	-.00	.03	-.02	1		
14.	No. of founders	1.28	2.28	-.02	.03	.11*	-.10*	-.03	-.03	.11*	-.01	-.03	.02	.03	.00	-.00	1	
15.	Environmental dynamism	.28	.45	.01	.02	.05*	-.04*	-.03	-.02	.06*	.05*	-.15*	.03^{+}	.06*	-.03	.05*	.05*	1

* $p < .05$; two-tailed test

As also revealed by our correlation analysis, the regression results depicted in Table 5.2 (Model 1) show that some of our control variables are significantly related to the financial performance of the young ventures. Specifically, Table 5.2 shows (marginally) significant relationships between a new venture's financial performance and both entrepreneurs level of education (β = .237; p < .01) and the number of employees (β = .061; p < .10).

Our regression analyses provide significant support for our hypotheses. Hypothesis 1 posits that new ventures profit from network exploration, i.e. when they add new partners to their network. As reflected in Table 5.2 (Model 2), this notion is fully supported by our analysis, which reveals a significant positive association between exploration in network development and new ventures' financial performance (β = .505; p < .05).

By showing a significant positive relationship between exploitation in network development and new venture financial performance (β = .512; p < .05), our results (Model 3) also provide support for our second hypothesis stating that new ventures engaging in network exploitation by utilizing existing network relationships are more successful than those that do not.

Our third hypothesis states that new ventures realizing an ambidextrous network development by means of simultaneously engaging in both exploration and exploitation will show superior financial performance over either network development activity. This postulates a positive effect of network ambidexterity on new ventures' financial performance and implies an inverted U-shaped relationship between our first ambidexterity measure, which is based on the the difference between entrepreneurs' engagement in explorative and exploitative network development, and performance.

We tested Hypothesis 3 by means of a quadratic model specification (Colombo et al., 2006; Wooldridge, 2009) including the ambidexterity measure as well as its squared term in the model and performed joint tests for significance. Confirming our hypothesis, our results (Model 4) indicate a positive significant relationship between new venture performance and the linear term (β = 1.46; p < .05), whereas the coefficient of the squared term is negative and also significant (β = -.028; p < .05). Since we control for network size in our analysis, this finding indicates that ambidexterity in network development is financially beneficial irrespective of the size of the network, i.e. the combined extent of exploration and exploitation activities.

Table 5.2. Logistic Random Effects Panel Regression Results

	New Ventures' Financial Performance					
	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**
Constant	174.464*	175.327*	176.001*	115.136	128.746	129.234
	(75.771)	(75.958)	(75.300)	(83.286)	(82.476)	(82.416)
Network size	.040	.010	-.015	.138	-.081	-.085
	(.044)	(.047)	(.051)	(.091)	(.057)	(.058)
Prior Industry experience	.506*	.508*	.511*	.392	.375	.375
	(.217)	(.217)	(.215)	(.238)	(.236)	(.236)
Independent venture	7.020	7.069	7.057	5.501	5.240	5.240
	(3.937)	(3.944)	(3.918)	(3.331)	(3.201)	(3.190)
Gender	-3.058*	-3.068*	-3.113*	-2.393	-2.263	-2.266
	(1.375)	(1.378)	(1.367)	(1.508)	(1.493)	(1.492)
Level of education	-.631^{+}	-.637^{+}	-.639^{+}	-.513	-.481	-.481
	(.380)	(.381)	(.377)	(.417)	(.413)	(.413)
Age of founder	-.833*	-.836*	-.839*	-.672^{+}	-.642^{+}	-.642^{+}
	(.341)	(.341)	(.338)	(.372)	(.369)	(.369)
No. of employees	2.061*	2.073*	2.078*	1.590^{+}	1.523	1.523
	(.862)	(.865)	(.857)	(.948)	(.939)	(.938)
No. of founders	2.867*	2.889*	2.888*	2.173	2.077	2.077
	(1.308)	(1.313)	(1.300)	(1.44)	(1.424)	(1.423)
Environmental dynamism	14.216*	14.280*	14.335*	10.819^{+}	10.356	10.351
	(5.954)	(5.969)	(5.917)	(6.541)	(6.481)	(6.476)
Inverted mill's ratio	-155.298*	-156.066*	-156.8453*	-118.918	-113.799	-113.749
	(66.416)	(66.580)	(66.006)	(72.947)	(72.286)	(72.222)
Network exploration		.508*				
		(.211)				
Network exploitation			.525*			
			(.239)			
Network ambidexterity				1.462*		
				(.724)		
Network ambidexterity²				-.028*		
				(.013)		
Weighted network ambidexterity					-.725^{+}	
					(.430)	
Herfindahl measure of ambidexterity						-1.256^{+}
						(.747)
Observations	1296	1296	1296	945	945	945
Log Likelihood	-643.563	-641.822	-641.126	-509.606	-511.749	-511.773

Standard errors in parentheses; $^{+}$ $p < .10$, * $p < .05$, ** $p < .01$; *** $p < .001$, results are reported as two-tailed.

To assess the stability of our results, we employed the weighted ambidexterity measure, and the Herfindahl-Index described in the methods section above as an alternative measures for ambidexterity in network development. Due to their construction, both measures are much less highly correlated with network size than our first measure. As depicted in Table 5.2 (Model 5 and Model 6), the results of the analyses show marginally significant negative effects (β = -.72, p < .10 for the weighted ambidexterity measure and β = -1.25, p < .10 for the Herfindahl-Index) of more exclusively relying on either exploration or exploitation in network developoment, confirming our previous findings. The positive relationship between ambidexterity in network development and new ventures' performance that we find is thus seems to be robust with regard to different model specifications and ambidexterity measures.

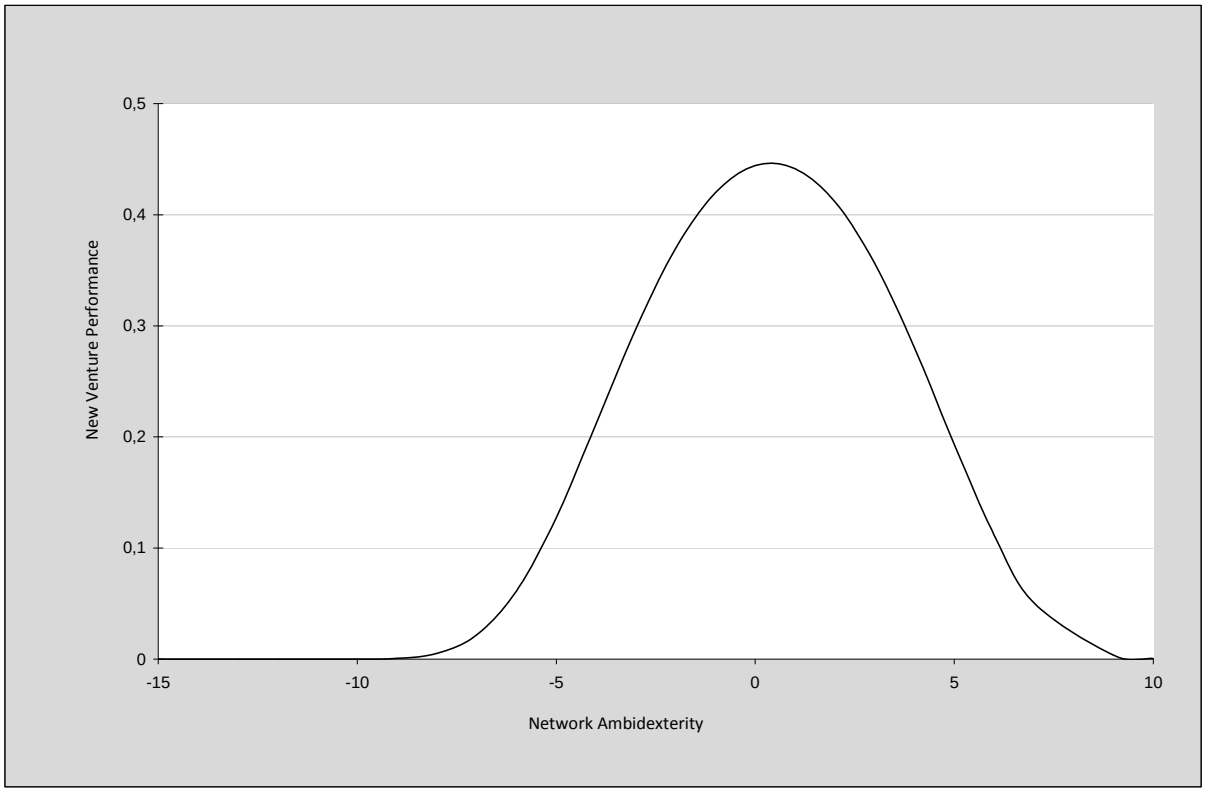
Furhtermore, we re-estimated our models using pooled logit regression analysis. The analysis confirmed our previous results by showing an inverted U-shaped relationship between our ambidexterity measure and new venture performance (β = 1.40, p < .01 for the linear term, and β = -.03, p < .01 for the quadratic term).

In order to make sure that our results are not driven by the fact that we excluded all those entrepreneurs who reported to not relying on network relationships at all, we re-estimated our models including them. Because this procedure boosted the number of observations, significance levels increased, yet our previous findings were confirmed.

Additionally, to adress endogeneity, we also calculated our models including as a control variable new venture performance in the preceding period (profitability in t-1) to check for a possible effect of state-dependence in financial performance (Heckman, 1981). Furthermore, we included new venture performance in the subsequent period (profitability in t+1) as the dependent variable in our models to check whether our results also indicate longer-term performance implications of network ambidexterity. Again, our results did not change substantially.

To get an impression of the optimal ratio between exploration and exploitation in network development within the range of the data in our sample (min: -25, max: 10), we plotted the predicted probabilities for new ventures' financial performance, setting all control variables at their means. As depicted in Figure 5.1, our results indicate that new ventures that an almost evenly balance exploration and exploitation in their network development maximize their chances of being profitable.

Figure 5.1. Ambidexterity in Network Development and New Venture Performance



5.5. Discussion

While research has produced considerable theory and cross-sectional analyses concerning how the structure and content of new ventures' network relations affect performance, there exists only limited case study evidence about how new ventures develop their networks over time and how different ways of network development affect new venture performance (Lechner & Dowling, 2003; Maurer & Ebers, 2006). Drawing on the ambidexterity literature, our study offers theory and supporting empirical evidence based on a large-scale longitudinal data set that extends our understanding of new ventures' network development and its performance implications.

Specifically, we argued and our results indeed show that new ventures benefit financially when they adapt the composition of their networks over time by establishing new network relationships. We submitted that such exploratory network development is beneficial, because new ventures are thereby better able to meet the changing resource requirements associated with the opportunities and challenges they face in course of their development (Hite & Hesterly, 2001; Lechner & Dowling, 2003; Maurer & Ebers, 2006). According to our findings, new ventures however also benefit financially from exploitative network development. We reasoned that entrepreneurs profit from relying on existing relationships, because these relations—as a result of the mutual trust and understanding developed over time (Bouty, 2000;

Larson, 1992)—provide an efficient way of accessing resources that are continually needed in the course of a new ventures' development. While informing research on new venture development, these findings also contribute to closing the striking research gap that exists in research on ambidexterity with regard to the direct performance effects of exploration and exploitation in firm networks in general (Lavie et al., 2010).

Our study further addresses the key question of ambidexterity in network development. Given the respective benefits of, and trade-off between, network exploration and exploitation, one can ask whether a focused strategy of network development or a particular mix of exploration and exploitation is comparatively more advantageous for new ventures. Our analysis shows that being equally engaged in both exploration and exploitation is most beneficial for new ventures over time. This result is consistent with the argument that ambidexterity in network development provides sustained performance advantages for new ventures because it balances the risks involved in not getting access to new resources on the one hand, and not getting access to resources on affordable terms, on the other.

By testing the ambidexterity hypothesis on a sample of newly founded and small firms, our study moreover strenghtens the case for the generality of the ambidexterity argument. While extant research has provided confirming evidence for the positive effects of ambidexterity in more mature firms (Lavie et al., 2010), our results reveal that ambidexterity is also beneficial for firms in the early stages of their development. Moreover, our results inform some previous research suggesting that ambidexterity in explorative and exploitative network development activities may have different performance effects for smaller and larger firms (2009). Based on an analysis of the alliance portfolios of 95 firms, Lin et al. (2007) find that being ambidexterously engaged in network exploration and exploitation in inter-organizational relationships has postive perfromance effects for large firms, whereas a focused formation of either exploratory or exploitative alliances benefits small firms. Lin et al. (2007) explain this finding with reference to resource constraints that may prevent small firms from successfully seeking ambidextrous alliance network development. In contrast, we find a positive effect of ambidexterity on new venture performance for the small firms we studied. The difference between our findings and the ones generated by Lin et al. (2007) may, however, to some extent also be due to the firm size differences in the two samples. While the ventures in our sample employ 1.1 people on average and are in the stages of new firm emergence and early growth, even the small firms in the data set used by Lin et al (2007) are much larger and more mature. Consequently, even the smaller firms in their sample should have much larger pools of slack resources at their disposal than the new ventures we studied and should thus better be able to mitigate the risks involved in overcommitting to either exploration or exploitation (Cao et al.,

2009). Consequently, the contrasting results of their and our study may point to the possibility that a potential moderating effect of firm size or resource endowment on the relationship between ambidexterity in inter-organizational networks and firm performance may not be linear and should be addressed in more detail by further research.

We note a number of limitations of our study that also indicate opportunities for future research. First, this study addresses the effects of simultaneously engaging in explorative and exploitative activities in network development, a concept that has been recognized as contextual ambidexterity (Beckman, 2006; Gibson & Birkinshaw, 2004; Im & Rai, 2008). As outlined by Lavie et al. (2010), organizations may, however, not only contextually balance their explorative and exploitative activities. Rather, they can also achieve ambidexterity by either organizationally or temporally separating both activities. Due to their small size, it is most probably not an option for new ventures to separate organizationally the establishment of new and the maintenance of existing contacts, as firms are most likely to comprise only a single organizational unit (Beckman, 2006). Yet it might well be fruitful for future research to address the performance implications of temporal separation—in terms of shifting from exploration to exploitation and vice versa over time—and to compare the relative performance implications of contextual and temporal ambidexterity network development strategies.

Second, we acknowledge that we have very limited information on the attributes of the partners with whom the new ventures in our sample collaborate and the kinds of relationships they maintain. Rather, this study solely focuses on the structure of new ventures' networks, i.e. on whether exchange relationships had existed in the previous period or not. It could thus be a fruitful broadening of the present study to extend earlier research by Lechner et al. (2006) and address the question whether the optimal balance between exploration and exploitation in network development differs across functional domains, such as R&D and marketing. Furthermore, it could be worthwhile to examine how the network development patterns originating in strong and weak ties observed in Elfring and Husink's (2007) case study relate to the development pattern of existing and new ties highlighted in the present research.

Third, we note that our dependent variable is binary in nature and represents a rather coarse indicator for the performance of a new venture. Even though a binary measure for profitability has been shown to be a valid indicator for performance in earlier (nascent) entrepreneurship research (Dimov, 2010; Diochon, Menzies, & Gasse, 2007; Gatewood, Shaver, & Gartner, 1995), we consider it fruitful for further research to complement our research by addressing the effects of ambidexterity in network

development based on more fine-grained performance measures, such as revenue and growth.

5.6. Conclusion

Despite the aforementioned limitations, we believe that our findings contribute to the literature in various ways. First, they extend research on new ventures' networks by confirming the widely recognized but so far rarely tested proposition that new ventures profit from network exploration. Additionally, we present a theoretical rationale and provide empirical evidence for positive performance implications of exploitation in network development. Perhaps most importantly, our results show that new ventures can realize financial performance benefits when they not only simultaneoulsy engage in both activities but also evenly balance them. With these findings, the study at hand responds to the call for analyzing network dynamics on the basis of longtitudinal data and contributes to answering a key question on the relationship between network dynamics and firm performance (Jack, 2010; Slotte-Kock & Coviello, 2010) by suggesting how networks have to be developed to suit the needs and conditions of new venture development over time.

Moreover, our findings contribute to the literature on exploration and exploitation in inter-organizational relationships (Lavie et al., 2010). Our study provides large-scale empirical evidence based on longitudinal data for the notion that both exploration and exploitation in inter-organizational relationships directly foster financial performance. Second, our study is—to the best of our knowledge—the first one to provide clear empirical evidence for the positive performance implications of contextual ambidexterity, i.e. the simultaneous exploration and exploitation in network development within one organizational unit. In this way, our results also contribute to the discussion on whether young and small companies may potentially profit from ambidexterity.

Finally, our findings also have practical implications for entrepreneurs of new ventures. By highlighting the beneficial performance implications of of contionuous, evenly balanced network development, the present study indicates that stable entrepreneurial networks will be less beneficial for the development of a new venture than ones where entrepreneurs, throughout the development of their ventures, maintain some of their legacy ties but at the same time continue to change the composition of their networks by developing new relationships.

Chapter 6

Contextual vs. Temporal Ambidexterity in Network Development: Which Provides the Better Pathway to Enhancing New Ventures' Financial Performance?

6.1. Introduction

Based on March's (1991) proposition that firms need to balance explorative and exploitative activities, the notion of ambidexterity (He, 2004; Lin et al., 2007; Tushman & O'Reilly III, 1996) has received considerable attention in various domains of management research, such as knowledge and innovation management, organization design, and inter-organizational relations (Lavie et al., 2010). Ambidexterity allows firms to be aligned and efficient in their management of present-day business demands while simultaneously remaining adaptive to changes in the environment (Raisch & Birkinshaw, 2008). In the domain of research on inter-organizational relations, previous studies have confirmed that firms profit from realizing ambidexterity in terms of being involved in both exploration, by developing new network relationships, and exploitation, by continuously relying on existing network partners (Ebers, Semrau, & Sigmund, 2011; Lin et al., 2007). However, firms can employ different modes of ambidexterity (Lavie & Rosenkopf, 2006; Lavie et al., 2010).

Specifically, it has been suggested that firms may simultaneously engage in exploration and exploitation within the same organizational unit (contextual ambidexterity), separate both activities organizationally (organizational ambidexterity) or temporally (temporal ambidexterity). Even though they have been widely recognized in the literature, we still lack empirical research that spells out which of these modes of ambidexterity is comparatively more beneficial, and under which conditions.

The present paper aims to contribute to shedding more light on this open question. Specifically, we develop and test hypotheses denoting conditions under which new ventures will profit from contextually or temporally balancing exploration and exploitation in their network development. New ventures provide a fruitful setting for studying this question, because it has been shown to be particularly crucial for the successful development of new ventures that they cultivate network relationships for accessing needed resources (Hoang & Antoncic, 2003; Jack, 2010; Street & Cameron,

2007) and adapt their networks over time in order to satisfy changing resource needs (Elfring & Hulsink, 2007; Hite & Hesterly, 2001; Lechner & Dowling, 2003; Maurer & Ebers, 2006). Moreover, previous research has demonstrated that new ventures profit from balancing explorative and exploitative activities in their network development (Ebers et al., 2011), yet has failed to compare relative performance outcomes of different modes of ambidexterity. The setting of new ventures seems especially appropriate for comparing the impact on financial performance of the contextual and temporal balancing modes, as new ventures usually consist of a single organizational unit and are thus unable to organizationally separate both activities (Beckman, 2006; Chandler & Hanks, 1994b; Meijaard et al., 2005).

When testing our contingency hypotheses based on longitudinal data from 158 ventures from the PSED II dataset, we find contextual ambidexterity to be the superior mode for new ventures in general. In line with our hypotheses, our results however also reveal that temporal ambidexterity has comparatively more positive performance implications under specific environmental, network- and organization-related conditions. Specifically, results indicate that environmental dynamism, the balance of exploration and exploitation realized over time as well as founders' human capital and the composition of founding teams have an effect on the relative profitability of contextual and temporal ambidexterity.

Based on the results presented, this study contributes to the literature in two main ways. First, this is one of the first studies empirically to discern the degree of ambidexterity, i.e. the balance between exploration and exploitation, from the mode of ambidexterity. Our study also goes beyond earlier research by uncovering particular environmental, network, and organizational contingencies that influence the relative performance outcomes of contextual and temporal ambidexterity (Lavie et al., 2010). It thus extends our knowledge on the performance implications of ambidexterity in inter-organizational relationships and their contingencies (Lavie et al., 2010). Second, the present study contributes to our understanding of different modes of network development and their consequences (Kilduff & Brass, 2010; Oczan & Eisenhardt, 2009) by highlighting contextual and temporal ambidexterity as alternative strategic pathways for securing needed resources and assessing their comparative performance effects.

6.2. Theory and Hypotheses

Exploration refers to activities involving "search, variation, risk taking, experimentation, play, flexibility, discovery, innovation" (March, 1991, p. 71), while exploitative activities are defined as including "refinement, choice, production, efficiency, selection, implementation, execution" (March, 1991, p. 71). The core

proposition forwarded by the literature on ambidexterity suggests that an organization's survival rests on its ability "to engage in sufficient exploitation to ensure its current viability and, at the same time, to devote enough energy to exploration to ensure its future viability. Survival requires a balance…" (Levinthal & March, 1993, p. 105).

In the context of firms' inter-organizational relations, it has been regarded as a form of exploration when organizations form relationships with new partners, whereas it is considered a form of exploitation when they continuously rely on existing partners (Beckman & Haunschild, 2002; Lavie et al., 2010; Lin et al., 2007). This particular conceptualization of exploration and exploitation in the domain of inter-organizational relations rests on the following reasoning. When exploiting existing network relationships, exchange partners build on and incrementally refine their joint expectations and common goals in order to implement and execute their exchanges effectively (Das & Teng, 2002; Ring & Van De Ven, 1994). When partnering organizations retain existing relations this benefits exchange efficiency, as the partnering organizations over time develop mutual understanding as well as heuristics for interacting and joint problem-solving that ease communication and collaboration (McEvily & Marcus, 2005; McFadyen & Cannella Jr, 2004; Uzzi, 1997). The establishment of new network ties, on the other hand, requires that organizational actors search for and locate new potential partners, assume the risk of investing in and experimenting with relations to heretofore unknown partners, and possess the flexibility to adapt to new requirements (Brouthers & Brouthers, 1997; Das & Bing-Sheng, 1997; Das & Teng, 2002; Ring & Van De Ven, 1994). By forming new network ties, firms may discover new possibilities, expand their knowledge base, and get access to new resources (Beckman et al., 2004; Lin et al., 2007).

Based on this conceptualization, and March's (1991) proposition that firms have to balance explorative and exploitative activities, previous research has provided first evidence for the notion that firms profit from ambidexterity in network development, in terms of being involved in the formation of new relationships as well as in the refinement and exploitation of existing ones. Lin et al. (2007) have shown that firms may profit from ambidexterity in terms of balancing the formation of new network relations and continuously relying on relationships with existing partners. Moreover, Ebers, Semrau and Sigmund's (2011) study indicates that new ventures achieve superior financial performance, when relying on roughly the same number of new and existing network relationships.

However, researchers have also pointed to the fact that a balance between exploration and exploitation may be realized in different ways (Lavie & Rosenkopf, 2006; Lavie et al., 2010). In case of contextual ambidexterity, firms simultaneously

engage in exploration and exploitation within the same organizational unit. In case of organizational ambidexterity, organizations separate units engaging in network exploration and exploitation thus spatially buffering the two activities. In case of temporal ambidexterity, an organization balances exploration and exploitation activities over time, i.e. alternates between periods of exploration and exploitation. Even though these strategies have been widely recognized, we still do not know much about which of these modes of ambidexterity is comparatively more beneficial, and under which conditions.

Subsequently, we will contribute to closing this gap in the literature by elaborating on the comparative advantages and disadvantages of contextually and temporally balancing ambidexterity in the field of new ventures' network development. Based on this elaboration, we then develop and test hypotheses on conditions under which it is more beneficial for new ventures to follow each of the two strategies.

6.2.1. Contextual Ambidexterity in New Ventures' Network Development

According to the definition provided above, following a contextual ambidexterity strategy implies that a new venture is, at the same time, engaged in network exploration in terms of developing new network relationships and network exploitation in terms of relying on and continuously refining existing ones. Reliance on existing network relationships ensures organizations' current viability, while the establishment of new network relationships secures future viability by providing access to new resources, capabilities and opportunities that may be exploited in later periods (Lavie et al., 2010). The core advantage of this strategy is that organizations may at the same time reap the efficiency benefits of exploitation while also covering the costs involved in exploration (Lavie et al., 2010). Moreover, there is some first evidence that a "context in which exploitation and exploration can simultaneously flourish might be considered as a valuable, rare, and costly to imitate resource, and therefore a potential source of competitive advantage" (Simsek, Heavey, Veiga, & Souder, 2009, p. 881).

Contextual ambidexterity is particularly beneficial for new ventures for two main reasons. First, it has been widely established that new ventures typically suffer from the liabilities of newness and smallness i.e. they are resource poor, limited in visibility and external legitimacy (Baum & Oliver, 1996; Freeman et al., 1983),. Due to these liabilities, any further current or future reduction of their limited resource base risks the viability of new ventures. A network development strategy of contextual ambidexterity to some extent can help mitigate this risk. Network exploitation allows a new venture to access currently needed external resources on attractive terms. It thus provides a resource base that can support the development of new relationships

through network exploration. Thus, a new venture can also seek to meet resource needs that secure its future development (Elfring & Hulsink, 2007; Hite & Hesterly, 2001). Second, due to their limited visibility, legitimacy, and record of accomplishment, it is not easy for new ventures to attract new network partners (Kor & Misangyi, 2008; Singh et al., 1986). If a new venture can point to a range of ongoing, active network exchange relationships, it might be easier for this new venture to develop new relationships, as existing network partners signal legitimacy and trust in a new venture's capabilities (Milanov & Fernhaber, 2009).

Yet, it is also quite challenging for firms to engage in contextual ambidexterity. It requires them constantly to pay attention to two distinct activities that compete for scarce resources and might imply conflicting requirements. The exploration of new opportunities involves other mind-sets, values and capabilities than the exploitation of existing ones. Contextual ambidexterity thus implies the risk that neither activity is realized effectively and efficiently (Chen & Katila, 2008; Lavie et al., 2010). Due to their limited size and resource base, this risk is particularly acute for new ventures' engaging in ambidextrous network development. New ventures may easily overstretch their resources and capabilities when trying closely to assess the fit of potential new networking partners, initiating trial collaborations, and carefully extending their scope (Elfring & Hulsink, 2007; Jack et al., 2008; Larson, 1992), while at the same time being involved in continuously and incrementally adjusting interactions with existing partners.

6.2.2. Temporal Ambidexterity in New Ventures' Network Development

When temporally balancing ambidexterity, a new venture focuses on either exploration or exploitation for a certain time before switching to the other activity. Such temporal separation can provide efficiency benefits of specialization (Chen & Katila, 2008). These benefits result from the fact that by focusing on a specific activity at a given point in time, actors enhance their ability to perform this activity efficiently (Burns & Stalker, 1961; Lawrence & Lorsch, 1967). Specialization further allows the realization of economies of scale such that the same output level is achievable with lower levels of inputs or that higher output levels are achievable with a given set of inputs (Edwards & Starr, 1987). By concentrating on either exploration or exploitation activities, actors can mitigate some of the resource constraints and conflicts that inhibit the strategy of contextual ambidexterity.

By means of temporal ambidexterity, new ventures can realize comparatively greater economies from specialization and scale effects in their network development activities than by means of contextual ambidexterity. Specialization and scale effects in the exploration of new relations exist, because entrepreneurs can utilize the same

event for approaching a larger number of potential new partners, e.g. at a trade fair or conference. Similarly, with regard to network exploitation at least some of the activities necessary for refining joint expectations and further developing common goals with existing network partners may be expanded to include a larger number of partners. When realizing contextual ambidexterity in their network development, entrepreneurs in every period will have to engage in both new partner exploration and existing partner exploitation activities. That is, they will have to attend events that provide the opportunity to approach new partners and have to organize other occasions in which they develop their relationships with the existing partners. In contrast, in case of a temporal ambidexterity strategy, entrepreneurs can concentrate in each period on either of the activities. Due to the specialization and scale effects that exits both with regard to network exploration and exploitation, entrepreneurs can thus economize on the time and resources they need for managing their network when they realize temporal ambidexterity in their network development. These effects are relevant for new ventures, as they are particularly limited in their physical and financial resources and the time their members can devote to network development (Batjargal, 2006; Elfring & Hulsink, 2007).

Yet temporal ambidexterity also involves significant challenges for entrepreneurs and their new ventures. While it may be more economizing on resources than simultaneous exploration and exploitation, it involves the challenge of developing new network relationships without at the same time being able to rely on existing partners for referrals and for gaining legitimacy. Consequently, temporal balancing may involve the risk that a new venture fails to make the transition from focusing on maintaining existing network relationships to successfully developing new ones.

As contextual and temporal ambidexterity in network development thus both entail specific benefits and risks for entrepreneurs and their new ventures, we expect that there is no universally superior strategy of network development. Rather, it seems likely that particular contingencies will affect which of the two strategies is comparatively more advantageous. Accordingly, in the following we develop hypotheses on how various contingencies affect the link between the mode of ambidexterity in new ventures' network development and new venture performance.

6.2.3. Contingencies of the Balancing Mode Performance Linkage

As we outlined above, contextual and temporal ambidexterity in network development impinge on the ease with which new ventures can develop and maintain network relationships through which they may access needed resources. Contingencies that influence the relative performance of the two modes of ambidexterity must thus affect the ease with which they can develop and maintain their relationships. In the

following, we suggest a number of such contingencies that relate to different contexts: a new venture's environment, network, and organization.

6.2.3.1. Environmental Characteristics

Since early contingency theory, scholars have pointed out that organizations have to align their strategies to environmental conditions (Lawrence & Lorsch, 1967). In entrepreneurship research, two environmental variables, dynamism and munificence, have shown to be particularly relevant, as they shape new ventures' opportunities and have an impact on their success (Eisenhardt & Schoonhoven, 1990; Schoonhoven, Eisenhardt, & Lyman, 1990). Based on these observations, we will delineate below why we expect that these two variables moderate the performance implications of contextual and temporal ambidexterity in new ventures' network development.

Environmental dynamism. Dynamic environments involve rapid changes in technology, competitors and market demands, thus creating uncertainty and business risk (Dess & Beard, 1984; Francis & Collins-Dodd, 2000). A central debate in organizational research concerns how firms may be effective in dynamic environments. Addressing this issue and recognizing that industries evolve through phases of incremental evolution punctuated by phases of rapid, intense change (Tushman & Anderson, 1986), previous research provided evidence for the notion that firms in dynamic environments tend to synchronize their engagement in explorative and exploitative activities with the nature of environmental changes. Specifically, Romanelli and Tushman (1994) have shown that fundamental changes in firms' organization follow major discontinuities in environmental conditions. Tyre and Orlikowski (1994) found that firms tend to take advantage of fundamental and incremental environmental changes by synchronizing their engagement in technological adaptation accordingly.

Correspondingly, we expect for two main reasons that new ventures in more turbulent and dynamic environments that undergo periodic fundamental shifts will profit from adopting a temporal balancing mode when developing their networks. First, significant environmental changes in technology, competitors, and market demands will decrease the relevance of existing network partners in developing new network relationships. While existing partners may legitimate a new venture and thus help it develop new network relationships, they will likely be of less utility under fundamentally changed environmental conditions, as they might lack the knowledge, resources or legitimacy that are relevant under the new conditions. If a new venture under such conditions sticks with its pre-existing partners, they will thus have only limited possibilities to support the development of new ties needed to fit with the new

environmental conditions. Second, we expect that the specialization benefits of following a temporal ambidexterity strategy are particularly relevant in dynamic environments undergoing fundamental change. In order to prevail in such environments, organizations need to be able to quickly learn about how to cope with new environmental conditions (Tushman & Anderson, 1986). New ventures benefit if they can economically seek out new partners who are able to support such learning. As we argued above, temporal ambidexterity in network development offers greater time and resource benefits than contextual ambidexterity. Based on these two lines of reasoning, we propose:

H1a. *Temporal ambidexterity in network development is relatively more beneficial for new ventures in dynamic environments than in stable environments.*

Environmental Munificence. Environmental munificence denotes the extent to which an environment offers an abundance of resources that can support sustained growth of a firm (Dess & Beard, 1984). A munificent environment is characterized by ample growth opportunities, weak competition, and low hazard rates (Cao et al., 2009; Schoonhoven et al., 1990; Strotmann, 2007). Research has shown that munificent environments enhance organizational performance (Goll & Rasheed, 2005; McArthur & Nystrom, 1991). Moreover, previous research also reveals that environmental munificence has a significant influence on organizations' structures, strategies, and processes (Goll & Rasheed, 2005). Miller and Friesen (1983), for example, found that firms respond to less munificent, hostile environments by more analytical strategy-making and reduced risk-taking and innovative activities. Similarly, Goll and Rasheed (1997) observed that firms in hostile environments pay greater attention to avoiding uncertainty and excessive risk-taking in order to ensure their survival.

Building on these findings, we expect that new ventures in less munificent environments will profit more when they engage in contextual ambidexterity. This is because in an environment where resources are scarce, it becomes critical for firms to avoid both the risk of obsolescence associated with exploitation and the risk of failure to appropriate associated with exploration. These risks are particularly virulent for new ventures for two main reasons. First, due to their smallness, new ventures are resources scarce. Second, due to their liability of newness, new ventures face difficulties in acquiring needed resources, as they lack legitimacy (Aldrich & Auster, 1986; Freeman et al., 1983; Kor & Misangyi, 2008). A contextual mode of balancing exploration and exploitation supports a comparatively more steady flow of resources and the ability to signal legitimacy through existing network partners. These properties are particularly beneficial in less munificent environments, where precarious resource flows can

quickly jeopardize new venture survival. In munificent environments, however, new ventures will suffer significantly less from their liabilities of newness and smallness, as the availability of abundant resources and lower competition makes it is easier for new ventures to acquire needed resources. We argue that temporal ambidexterity is the comparatively more profitable mode of ambidexterity in munificent environments, as it allows new ventures to reap specialization benefits in resource acquisition that are not available when engaging in contextual ambidexterity. Consequently, we propose:

H1b. *Temporal ambidexterity is relatively more beneficial for new ventures in munificent than in resource-scarce environments.*

6.2.3.2. Network Characteristics

Based on the notion that managing network relationships entails costs (Ebers & Grandori, 1997; Witt, 2004) and the fact that temporal ambidexterity comes with specialization benefits that increase the efficiency of network management, we expect that differences in characteristics of new ventures' networks will also have an impact on the relative performance implications of the two modes of ambidexterity. In particular, we will argue that a temporal balancing strategy is relatively more advantageous when the size of a new venture's network increases and when it realizes a more balanced ratio between network exploration and exploitation.

Network Size. Previous research indicates that it is time consuming and costly for entrepreneurs to develop and maintain network relationships (Ebers & Grandori, 1997; Witt, 2004). Entrepreneurs' network management capacity therefore is limited (Batjargal, 2006; Elfring & Hulsink, 2007). Entrepreneurs who spend too much time on developing and maintaining network relationships may even compromise their new ventures' performance (Elfring & Hulsink, 2007; Semrau & Werner, 2012). With this in mind, we expect that temporal ambidexterity in network development will become relatively more beneficial with increasing network size.

As a consequence of the specialization and scale benefits associated with temporal ambidexterity (Chen & Katila, 2008), the average cost for developing new network relationships and for maintaining existing ties should decrease with the number of new relationships established respectively the number of existing relationships maintained, in any given period. This in turn implies that new ventures with larger networks, comprising a larger number of new and/or existing ties that have to be managed, should profit significantly more from realizing temporal ambidexterity. We thus propose:

H2a. *Temporal ambidexterity becomes relatively more beneficial for new ventures with increasing size of a new venture's network.*

Degree of Ambidexterity. In line with March's (1991) initial notion and previous research in the field of inter-organizational relationships (Ebers et al., 2011; Lin et al., 2007), we defined ambidexterity in new ventures' network development as being engaged in network exploration as well as exploitation. However, firms realizing ambidexterity may be involved in explorative and exploitative activities to different degrees, i.e. the precise balance between existing and new ties may vary at any given point in time.

As outlined above, entrepreneurs who maintain a larger network should profit more from realizing temporal ambidexterity, as they may reap relatively larger efficiency benefits from focusing on managing either explorative or exploitative activities at any given point in time. We suggest that independent of network size, the comparative efficiency benefits of temporal ambidexterity increase with the extent to which new ventures are more equally involved in network exploration and exploitation. Consider the following stylized but illustrative example: Venture A has a constant network size of four and is equally engaged in network exploration and exploitation over two periods, i.e. it develops four new relationships in total. When contextually balancing exploration and exploitation, Venture A would thus develop two new and maintain two existing network relationships in both periods. When temporally balancing the two activities, it would be involved in maintaining four existing ties in one period and in developing four new ones in the other. Consequently, Venture A should realize significant efficiency benefits from specialization when realizing a temporal balancing mode. Venture B also has a network size of four in the two periods, but is not equally engaged in network exploration and exploitation. It only develops two new network relationships over the two periods. For Venture B, following a temporal balancing strategy would thus imply that it has to maintain four existing network partners in one period and develop two new partners as well as maintain two existing ones in the other.

To the extent that entrepreneurs can realize specialization and scale effects when managing their network relationships, the average costs of developing new network relationships and maintaining existing ones, respectively, should decrease with the number of relationships newly established or maintained in a single period. In the above example, Venture A will then bear significantly lower average costs for developing new network relationships than Venture B. It will also have significantly lower average costs for maintaining pre-existing ties over the two periods. In line with this reasoning, we propose:

H2b. *Temporal ambidexterity becomes relatively more beneficial with the extent to which new ventures are more equally involved in developing new and retaining existing ties.*

6.2.3.3. Founders' and Organizations' Characteristics

Research in entrepreneurship has a long and lasting tradition of relating founders' and founding teams' characteristics to entrepreneurial outcomes (Baum & Locke, 2004; Gartner, 1985; Mitchell et al., 2002; Zhao et al., 2010). In line with this tradition, we suggest that some of these very characteristics—namely founders' human capital and founding team composition—will also affect the link between the mode of ambidexterity and new venture performance.

Entrepreneurs' Human Capital. Earlier research has shown that founders' human capital is positively associated with new ventures' performance (Colombo & Grilli, 2010; Unger, Rauch, Frese, & Rosenbusch, 2011). Additionally, it has been shown that founders' human capital is connected to explorative activities, such as identifying and pursuing new business opportunities (Ucbasaran, Westhead, & Wright, 2008), and the ability to exploit business opportunities (Chandler & Hanks, 1994a; Shane & Venkataraman, 2000). Expanding on these previous findings, we suggest that founders' human capital will also have an effect on the performance implications of contextual and temporal ambidexterity.

We expect that a founder's human capital has a positive effect on the comparative advantage of temporal over contextual ambidexterity in network development, because it has a positive effect on founders' legitimacy. A positive link between founders' human capital and legitimacy has been widely recognized in the literature. For instance, Packalen (2007) argues that the organizational legitimacy of a new venture, and thus its ability to attract partners for cooperation and gain access to external resources, is significantly affected by founders' status, which, in turn, is partially determined by their education. Likewise, Cohen and Dean (2005) consider the human capital of new ventures' top management as a factor conveying legitimacy, as it reflects individuals' propensity towards viable, economically attractive business ideas and is observable to external stakeholders. Moreover, Tornikoski and Newbert (2007) forward that entrepreneurs' human capital plays a significant role for the legitimacy ascribed to new ventures by resource gatekeepers such as financiers, because it is viewed as beneficial in overcoming problems during the start-up and early development stages of a new venture.

Based on these observations, we suggest that with increasing human capital of entrepreneurs temporal ambidexterity becomes more beneficial for new ventures. As

described above, temporal ambidexterity can be problematic for new ventures, as they are not able to rely on existing network partners who convey legitimacy. This may hamper their capability to develop new network relationships (Milanov & Fernhaber, 2009). However, entrepreneurs' human capital also represents a signal of legitimacy. We thus expect that entrepreneurs with a high level of human capital can—at least to some extent—compensate for a lack of existing network partners when trying to attract new ones. Consequently, we expect founders with high human capital to suffer less from the disadvantages associated with temporal ambidexterity and consequently propose:

H3a. *Temporal ambidexterity becomes relatively more beneficial for new ventures with increasing human capital of their founders.*

Team Homogeneity/Heterogeneity. A significant body of research indicates that founding teams' characteristics may also have a significant effect on new ventures' performance (Chowdhury, 2005; West, 2007). Moreover, Beckman (2006) has shown that founding teams' homogeneity or heterogeneity impacts the levels of explorative and exploitative activities that new firms realize. Extending these observations, we will subsequently line out why we expect that founding teams' cognitive homogeneity/heterogeneity may also have an impact on the relative benefits associated with contextual and temporal ambidexterity in new ventures' network development.

While founding team diversity can be defined on the basis of a wide range of characteristics, e.g. gender, age, nationality or professional background, diversity in these or other dimensions assumes relevance for team performance only insofar as it influences team member decisions and actions. Such behavioral consequences may result from divergent cognitions, beliefs and values held by team members from different backgrounds or from different individual socialization and learning processes that lead to distinct patterns of behavior. As socialization and learning also represent cognitive processes, diversity of team members' cognitions, beliefs, and values represents the most basic dimension of team heterogeneity.

Previous research has shown that a founding team's composition has an effect on its perceived legitimacy. MacMillan, Siegel and Narashima (1985) as well as Riquelme and Watson (2002) provide evidence for the notion that venture capitalists often consider the characteristics of a founding team when making financing decisions. Yet even though there is consensus that founding teams' composition may be relevant for the willingness of potential external resource providers' to grant access to their resources, there is significant dissent as to whether homogeneous or heterogeneous founding teams are perceived as more legitimate (Packalen, 2007). On the one hand, it

is argued that heterogeneous founding teams are superior in performance and thus perceived as more legitimate, as cognitive heterogeneity may facilitate decisions of superior quality and more creative solutions (Pelled, Eisenhardt, & Xin, 1999; Shin, Kim, Lee, & Bian, 2012). Moreover, heterogeneous founding teams also have a wider array of prior social connections that can contribute to perceived legitimacy (Beckman, 2006; Packalen, 2007). On the other hand, there also exists evidence for the notion that homogenous founding teams are viewed as more legitimate by potential resource providers (Packalen, 2007). Homogeneous founding teams may realize superior performance due to similar belief structures and attitudes as well as a shared language and perspectives that enables them to more quickly agree on what needs to be done in critical situations and be more efficient in subsequent action (Beckman, 2006; Eisenhardt & Schoonhoven, 1990; Nahapiet & Ghoshal, 1998).

Based on these two lines of reasoning, we expect that founding teams that are either homogenous or heterogeneous with regard to their cognitions will be considered more legitimate than their counterparts realizing a medium level of homogeneity/heterogeneity. Consequently, we suggest that homogenous as well as heterogeneous founding teams suffer less from the downsides associated with temporal ambidexterity, i.e. from not having existing network partners who provide legitimacy and a constant flow of resources, and thus profit relatively more from realizing temporal ambidexterity. In contrast, we expect contextual ambidexterity in network development to be more suitable for new ventures whose founding teams exhibit a medium level of homogeneity/heterogeneity. This is because founding teams with a medium level of homogeneity/heterogeneity are better able to deal with the challenges involved in contextually balancing ambidexterity (Beckman, 2006). Consequently, we propose:

H3b. *Temporal ambidexterity is relatively more beneficial for new ventures with cognitively heterogeneous or homogenous founding teams, while contextual ambidexterity is relatively more beneficial for founding teams with a medium level of cognitive homogeneity/heterogeneity.*

6.3. Method

We tested our hypotheses on the basis of the publicly available PSED II dataset. It comprises five waves of data on 1214 US entrepreneurs and their ventures in different stages of the entrepreneurial process. The PSED II research design, data collection, and sample statistics are described in great detail in Reynolds (2011).

We drew a sub-sample from this data set that comprises only data for those entrepreneurs who already established a new venture and reported that they had established external network ties. Since temporal ambidexterity can only be observed over time, we further restricted our sample to those 197 entrepreneurs who reported relevant information in at least two subsequent waves of the study. Our final sample thus represents a subset of firms used in an earlier paper (Ebers et al., 2011) and comprises 311 observations, each covering the data of two succeeding waves of data collection.

The new ventures in our sample operate in a wide range of industries, such as construction, manufacturing of signs and musical instruments, clothing, cosmetics, food services, real estate, computer systems, consulting, and educational services. The age of our respondents ranges from 18 to 75 and up, with a mean of 42 years. About 63% of the entrepreneurs in our sample are male and the majority (73%) has at least some college education.

6.3.1. Measures

Where possible, we relied on earlier measure of the constructs (see Ebers, Semrau, & Sigmund, 2011).

6.3.1.1. New Ventures' Financial Performance

New venture performance was measured by asking the respondents in each wave whether their monthly revenue exceeded their monthly expenses for more than six of the past twelve months (Reynolds, 2011). As we treat the information for two subsequent waves as one observation, we aggregated the performance data for the two waves (the information provided for wave t_0 with the information of wave t_{-1}). The financial performance measure thus indicates whether respondents' revenues in the different observation periods exceeded their monthly expenses for more than 12 of the past 24 months. This measure takes the value of one when the performance criterion is met and zero otherwise.

6.3.1.2. Exploration, Exploitation and Modes of Ambidexterity

We followed earlier studies (Beckman et al., 2004; Perretti & Negro, 2006) and regarded a new network relationship as a form of exploration and the continued reliance on an existing partner as a form of exploitation. To capture both variables, we followed previous studies using PSED data and used the number of newly added (exploration) and already existing (exploitation) "helpers" reported in each wave (Aldrich & Carter, 2004; Newbert & Tornikoski, 2010). A "helper" is defined as a

person who does not have an ownership stake but makes a distinctive contribution to the new venture, such as providing financial resources, materials, training, business services, knowledge and information (Aldrich & Carter, 2004; Newbert & Tornikoski, 2010). For each wave of the panel, the PSED data set provides information on the total count of helpers for every entrepreneur as well as the number of helpers that were established since the previous wave.

To capture whether a new venture realizes a *temporal or contextual mode* of ambidexterity in balancing exploration and exploitation in network development, we constructed a measure reflecting whether the mix of exploration and exploitation in network development realized by a new venture varies over time (temporal ambidexterity) or remains constant (contextual ambidexterity). To do so, we first calculated the proportion of exploration to exploitation for every new venture in every wave of data collection by dividing the number of new relationships by the total size of the helper network. This continuous variable takes the value of one when entrepreneurs exclusively rely on network exploration in that period, zero when they are solely engaged in network exploitation, and .5 when they are engaged in both activities to a similar degree. For each pair of waves, t_0 and t_{-1}, we then calculated the absolute value of the difference between the ratios of new relationships and network size. This measure takes the value of one when an entrepreneur realized temporal ambidexterity by switching from being exclusively engaged in exploration (exploitation) in the preceding period (t_{-1}) to exclusively being engaged in exploitation (exploration) in the subsequent period (t_0). It takes the value of zero when entrepreneurs realize the same ratios of exploration and exploitation in two subsequent waves and thus engage in contextual ambidexterity. For the ease of interpretation, we named this measure *temporal ambidexterity*.

The reliability of difference measures has frequently been questioned. This critisicm is based on the fact that difference measure have shown to be unreliable when component variables are moderately positively correlated, which is often the case, for example when measuring changes(Cronbach & Furby, 1970; Linn & Slinde, 1977). Thus, we checked the correlation between the ratios of new relationships and network size for each pair of waves (t_0 and t_{-1} for every wave). As our analysis revealed that the ratios are not significantly correlated (r = .047, p = .22), we are confident that our difference measure is reliable(Bergh & Fairbank, 2002; Tisak & Smith, 1994).

6.3.1.3. Environmental Dynamism and Environmental Munificence

In contrast to low-tech firms, high-tech ventures face turbulent business environments that are subject to rapid changes (Francis & Collins-Dodd, 2000; Schoonhoven et al.,

1990). We thus used the item "Would you consider this (new) business to be hi-tech?" to capture differences in the *dynamism of new ventures' business environment*. The variable takes the value of one when the new venture operates in a hi-tech industry and zero otherwise.

According to Schoonhoven et al. (1990), an *environment is munificent* for a new venture when it is characterized by a market with few competitors. Consequently, we relied on the item "Right now, are there (1) many, (2) few, or (3) no other businesses offering the same products or services to your potential customers?" to capture environmental munificence. We again calculated the average value of two waves and included this measure in our analyses.

6.3.1.4. Network Size and Degree of Ambidexterity

In line with other studies in the field (Aldrich & Carter, 2004; Newbert & Tornikoski, 2010), we relied on the total count of helpers as an indicator for *network size*. We used the average number of helpers over two subsequent waves of data collection in our analyses.

To separate the *degree of ambidexterity*, i.e. balance of exploration and exploitation over time, from the type of balancing mode, we constructed a continuous measure that reflects the extent to which an entrepreneur engages in network exploration and/or exploitation over the two subsequent periods that we combined to a single observation. Covering two instead of a single period, this measure differs significantly from the ambidexterity measure used in Ebers et al. (2011), and leaves open how exploration and exploitation are balanced over the two periods (i.e. more contextually or more temporally). Specifically, we calculated the degree of ambidexterity as the absolute value of the number of new helpers minus the number of preexisting helpers, divided by the size of the network. For ease of interpretation we then reverse coded this ratio. No matter whether the venture applies a contextual or temporal balancing mode, the resulting measure at the extremes takes the value of zero when a new venture is, over two periods, equally involved in exploration and exploitation in network development, and takes the value of minus one, when a new venture is exclusively engaged in exploration or exploitation over two periods.

To test for the stability of our results, we also developed a second measure reflecting the degree of ambidexterity over time. In particular, we calculated a Herfindahl-index (Hirschman, 1964; Jacquemin & Berry, 1979). The index takes the form $(x_1/x)^2 + (x_2/x)^2$, where x_1 is the sum of new ties for ervery pair of waves, x_2 is the sum of maintained ties for every pair of waves, and x is the sum of x_1 and x_2. We then reverse coded the index. Thus, the index takes the value of minus one for every

pair of periods in which an entrepreneurs is exclusively engaged in one of the activities, and minus .5 if the they are equally balanced over the two periods.

6.3.1.5. Human Capital and Team Homogeneity/Heterogeneity

According to Ucbasaran et al. (2008) and Unger et al. (2011), the *level of education* is the most frequently examined component of human capital, because it is a central source of knowledge and skills. According to entrepreneurship research, it is the lead entrepreneur's human capital that is most relevant with regard to venture development processes (Tornikoski & Newbert, 2007). We thus captured founders' human capital by measuring the highest level of education of the lead entrepreneur in 10 categories ranging from 1 (education up to eighth grade) to 10 (indicating a Law, PhD, or EDD degree).

Pertinent research has shown that homophily has the most pronounced effect on group composition in social networks (Chowdhury, 2005; McPherson, Smith-Lovin, & Cook, 2001; Ruef, Aldrich, & Carter, 2003). Through their interaction processes team members over time will further align their cognitions, beliefs, and perspectives (Beckman, 2006; Eisenhardt & Schoonhoven, 1990). Accordingly, we relied on the average duration of team members' prior history of interaction to capture *founding teams' cognitive homogeneity/heterogeneity*.

6.3.1.6. Controls

On an individual level, we included *gender* (male = 0, female = 1) of the lead entrepreneur as a control, because men and women tend to differ with respect to their networks (Moore, 1990; Renzulli et al., 2000). Moreover, previous research has shown some evidence for gender-specific barriers to entrepreneurial success (Murphy et al., 2007). We also added the *age of the lead entrepreneur* as a control to our analysis, because younger and older entrepreneurs likely differ in terms of the resource base they have available which may influence the performance of their ventures (Parker, 2004). We additionally controlled for some firm-level factors. Recognizing that the PSED II data set comprises independent and dependent new ventures, a characteristic that might influence ventures' performance and their need for external support (Matthews et al., 2009), we controlled for the *independence of the venture* (dependence = 0, independence = 1). We furthermore included the *number of founders* as a control, because the size of the founding team may influence the capacity to develop and manage network relationships (Batjargal, 2006).

6.3.2. Analysis

Since our dependent variable is binary, we tested our hypotheses using logistic random-effects regression. In this way, we could also account for between-group variance, i.e. the systematic variation between different ventures at the same point in time, and within-group variance (Tabanick & Fidell, 2007; Wooldridge, 2002). In order to determine whether random-effects modeling was the most efficient approach, we conducted a comparison with a fixed-effects model by means of a Hausman test (Hausman, 1978; Stuart & Sorensen, 2007). As we found no significant differences between the two approaches, we conclude that the random-effects model provides the more efficient estimation.

To test for the hypothesized interaction effects, we followed the recommendations of Aiken and West (1991) and Frazier, Tix and Barron (2004) and mean-centered and standardized all our non-binary independent and moderator variables. We then formed the interaction terms by multiplying the respective measures. With regard to hypotheses 1a, 1b, 2a, 2b, and 3a we hypothesized a linear moderation and thus constructed the interaction term by multiplying the linear standardized moderator and the standardized independent variable. In hypothesis 3b we hypothesized a u-shaped moderation and thus measured the interaction effect by multiplying the squared standardized moderator and our standardized independent variable.

Computing our regression, we first entered the control variables (Model 1) before testing the main effect of contextual and temporal ambidexterity in the second step (Model 2). In a third step, we included the two-way interaction terms to test our moderation hypotheses (Models 3 to 8) and analyzed how they contribute to explaining the variance of our dependent variable (Jaccard, Teitel, & Turrisi, 2003).

As the PSED II data are based on self-reports, they may potentially be biased. Even though a large number of earlier studies make use of the PSED data (see Reynolds, 2007), and broad evidence giving support for the reliability and validity of self-reported measures (Brush & Vanderwerf, 1992; Lechner et al., 2006; Peng & Luo, 2000), we also conducted Harman's one-factor test for the presence of common method bias. Our analyses extracted six distinct factors with an Eigenvalue greater than 1, which together accounted for 60 percent of the total variance. With the first factor accounting for only 16 percent of the variance, we are confident that common method bias is not a serious issue in our study.

One problem with analyzing new venture performance is that only the firms that survive are studied. To control for the unobserved heterogeneity that may affect firms' probability of being in our sample and firm performance, we adapted a procedure widely used in empirical studies relying on longtitudinal data (Delmar & Shane, 2006).

Specifically, we predicted the probability of venture failure during the 5 waves of observation using a probit model on firm exit. The independent variables of this survivorship model include variables that measure founders' characteristics (age, gender, marital status, education, race), firm-specific characteristics (firm size and age, dependence on a parental organization, number of founders), and other independent variables (network size, ambidexterity in netowrk develpoment, network exploration and exploitaion, ambidexterity mode, evironmental dynamism, obtained government loan, purchased venture). Based on the obtained estimates, we computed the inverse Mill's ratio for all the firms included in our sample and inserted it as a control for selection bias in our equations.

6.4. Results

Means, standard deviations and correlations for our variables are shown in Table 6.1.

With respect to the control variables, the results of the correlation as well as the regression analysis depicted in Table 6.2 reveal that founders' level of educaiton (β = -.532; p < .05, Model 1) is significantly related to the financial performance of new ventures Additionally, Table 6.2, Model 1 reveals no significant link between the degree of ambidexterity over the two periods and new ventures' financial performance.

When adding our measure for temporal/contextual ambidexterity to the estimation (Model 2), we find a marginally significant negative relationship with new ventures' financial performance (β = -.999; p < .10). This result indicates that, in general, contextual ambidexterity in network development is more beneficial for new ventures than temporal ambidexterity.

Table 6.1. Means, Standard Deviations and Correlations

	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12
1. New venture financial performance	.50	.50	1											
2. Temporal ambidexterity	.16	.28	-.12*	1										
3. Environmental dynamism	.28	.45	-.06	.02	1									
4. Environmental munificence	1.88	.94	-.05	.03	.01	1								
5. Weighted Ambidexterity	.91	.24	-.06	.48*	.04	.04	1							
6. Network size	3.16	4.62	-.12*	.06	.08*	.07*	-.09*	1						
7. Level of education	5.83	2.13	.10*	.07*	.09*	.08*	.03	.03	1					
8. Team homogeneity	2.56	3.24	.03	-.03	.20*	.02	.01	.01	-.05	1				
9. Gender	.37	.48	-.02	-.03	-.15*	.04*	-.01	.02	.08	.06*	1			
10. Age of founder	42.26	1.23	-.01	.02	.03	.09*	.01	.06*	.20*	.45*	-.07*	1		
11. Independent venture	.69	.46	-.01	-.06	-.03	-.01	-.04	-.01	.01	-.01	.06*	.05*	1	
12. No. of founder	1.25	.80	-.05	.01	.05*	-.02	.04	.10*	.04*	-.04	-.03	.02	.01	1

* $p < .05$, two-tailed test

Table 6.2. Logistic Random Effects Panel Regression Results

	New ventures' financial performance							
	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**	**Model 7**	**Model 8**
Constant	-4.559 (2.810)	-.470 (7.480)	1.319 (7.180)	-.194 (7.235)	-2.55 (8.652)	1.059 (9.465)	.257 (7.351)	6.461 (19.710)
Gender	-.115 (.222)	-.183 (.249)	-.093 (.253)	-.139 (.253)	-.140 (.256)	-.138 (.268)	-.123 (.250)	.009 (.311)
Age of founder	-.130 (.238)	-.057 (.252)	-.056 (.267)	-.085 (.266)	-.107 (.268)	-.102 (.277)	-.133 (.262)	-.025 (.278)
Independent venture	-.115 (.223)	-.037 (.262)	-.001 (.266)	-.058 (.266)	-.110 (.289)	-.067 (.296)	-.030 (.264)	.040 (.507)
No. of founders	-.565 (.564)	-1.111 (.689)	-1.321^{+} (.763)	-1.368^{+} (.773)	-1.421^{+} (.775)	-1.610^{+} (.821)	-1.407^{+} (.768)	-1.311^{+} (.784)
Inverse Mill's ratio	3.876^{+} (2.310)	3.50 (5.659)	1.471 (5.80)	2.924 (5.843)	5.072 (6.830)	3.285 (7.324)	2.570 (5.925)	-2.694 (18.290)
Environmental dynamism	-1.046 (.636)	-1.444 (1.199)	-1.087 (1.232)	-1.449 (1.239)	-1.809 (1.401)	-1.522 (1.476)	-1.355 (1.247)	-.398 (3.445)
Environmental munificence	-.176 (.234)	-.071 (.160)	-.248 (.311)	-.156 (.308)	-.052 (.171)	-.201 (.356)	-.187 (.308)	-.389 (.641)
Network size	-1.188* (.532)	-1.225 (1.225)	-.813 (1.243)	-1.109 (1.252)	-1.600 (1.493)	-1.050 (1.553)	-1.025 (1.266)	.134 (3.889)
Degree of ambidexterity	.090 (.071)	.086 (.132)	.115 (.133)	.107 (.134)	.076 (.138)	.270 (.207)	.117 (.136)	.185 (.175)
Level of education	.532* (.238)	.401 (.258)	.342 (.263)	.388 (.263)	.430 (.265)	.412 (.273)	.421 (.259)	.311 (.287)
Team homogeneity	.102 (.389)	.252 (.260)	-.218 (.451)	-.152 (.450)	-.115 (.447)	-.116 (.465)	-.069 (.440)	-.341 (.467)
Team homogeneity²	.139 (.181)	-.007 (.169)	.224 (.194)	.227 (.198)	.221 (.199)	.231 (.206)	.204 (.195)	.385^{+} (.224)
Temporal ambidexterity		-.999^{+} (.545)	-1.169* (.572)	-1.129* (.571)	-1.016^{+} (.558)	.475 (.996)	-1.221* (.582)	-1.234* (.615)
Temporal ambidexterity x environmental dynamism			.445* (.220)					
Temporal ambidexterity x environmental munificence				.225 (.242)				
Temporal ambidexterity x network size					-.218 (.386)			
Temporal ambidexterity x weighted degree of ambidexterity						.227^{+} (.135)		
Temporal ambidexterity x level of education							.373^{+} (.217)	
Temporal ambidexterity x team homogeneity²								.735^{+} (.439)
Observations	311	311	311	311	311	311	311	311
R^2	.083	.132	.136	.134	.134	.135	.135	.135

Std. Err. in parentheses;$^{+}$ $p < .10$, * $p < .05$, ** $p < .01$; *** $p < .001$

Providing considerable support for our moderation hypotheses, further analyses reveal that the benefits of contextual and temporal ambidexterity are affected by different contingencies. Supporting Hypothesis 1a, Table 6.2 (Model 3) shows a significant positive association between the interaction term of temporal ambidexterity and environmental dynamism with new ventures' financial performance (β = .445; p < .05). This provides confirming evidence for our suggestion that temporal ambidexetrity is relatively more beneficial in dynamic environments. In contrast, Hypothesis 1b is not supported by our data (Model 4, β = .225; p = .39).

Our analysis does not provide empirical support for Hypothesis 2a, as the data show no significant relationship between the interaction of new ventures' network size and temporal ambidexterity with new ventures' financial performance (Model 5, β = -.218; p = .29). In contrast, Hypothesis 2b receives marginal support (Model 6, β = .227; p < .10). It suggested that temporal ambidexterity is more beneficial for new ventures that are more equally engaged in exploration and exploitation in network development. We assessed the stability of this result by re-estimating this analysis employing an interaction term comprising temporal ambidexterity and the Herfindahl-index of the degree of ambidexterity. However, results indicated a marginal significant moderating effect of equally balancing network exploration and exploitation (β = .539; p < .10). Thus our result seems to be robust against different measures of degree of ambidexterity.

Hypothesis 3a also receives marginal support (Model 7, β = .373; p < .10). It proposed that temporal ambidexterity in new ventures' network development becomes more beneficial with increasing human capital of new venture founders. To test Hypothesis 3b, which proposes that temporal ambidexterity is more beneficial for homogenous and for heterogeneous founding teams, we ran two different analyses. Both include a term that reflects the interaction of the squared value for homogeneity/heterogeneity and our measure for temporal/contextual ambidexterity. We first run our analysis with the complete dataset, assigning a homogeneity/heterogeneity value of zero to all single entrepreneurs in our sample. As depicted in Table 6.2 (Model 8) this analysis reveals a marginally significant interaction effect (β = .735, p < .10). We then tested our hypotheses with a data set only comprising founding teams, which decreased the number of observations from 215 to 158. We again found the two-way interaction of the squared term of homogeneity/heterogeneity and temporal ambidexterity to have a marginally significant positive effect (β = .733, p < .10). Consequently, and in line with our hypothesis, homogeneous and heterogeneous founding teams seem to profit marginally from temporal ambidexterity, while contextual ambidexterity seems to be relatively more appropriate for teams with a medium level of homogeneity/heterogeneity.

To test for the robustness of our findings, we conducted some additional analyses. First, we re-estimated our models using pooled logit regression analysis. Furthermore, we included new venture profitability in the subsequent observation periods (profitability in t_{+1} and t_{+2}) as the dependent variable in our models to check whether our results also have longer-term performance implications. Finally, we checked for endogeneity in terms of a state-dependence in profitability (Heckman, 1981), and also included new venture perfromance of the preceding observation periods (profitability in t_{-2} and t_{-3}) in our analyses.

The results described above proved to be robust with regard to all these variations.

6.5. Discussion

The present paper seeks to advance the emerging stream of research on exploration, exploitation and ambidexterity in the context of inter-organizational relationships. We comparatively examined two alternative pathways of network development to enhancing new ventures' financial performance. Specifically, we highlighted how several environmental, network- and organization-level contingencies affect whether new ventures benefit comparatively more from engaging in either contextual or temporal ambidexterity when developing their networks of external resource providers.

Earlier research has mainly concentrated on how the balance between exploration and exploitation affects organizational performance (Cao et al., 2009; Ebers et al., 2011; Lin et al., 2007). The present study extends this research and reveals that—when holding the balance between exploration and exploitation in network development constant over time—contextual ambidexterity in general seems to be the most beneficial mode of balancing exploration and exploitation for new ventures. We argued that by means of contextual ambidexterity, new ventures may comparatively better mitigate their liabilities of newness and smallness. Exploitation in network development, i.e. reliance on existing partners, allows new ventures to access on favorable conditions the resources necessary for securing their current viability. These existing partners then also ease access to new partners, e.g. through referrals or signalling the legitimacy of the new venture, who potentially can provide resources necessary for the new ventures future viability. By means of contextual ambidexterity, new ventures can thus simultaneously realize efficiency benefits of network exploitation and secure a stream of support that is crucial for future firm development. In contrast, when new ventures temporally separate exploration and exploitation, they lack at any given point in time either the benefits of exploitation or the opportunity to

build needed new relationships by relying on existing partners for referrals and for gaining legitimacy.

However, we argued that under particular conditions temporal separation of exploration and exploitation may be relatively more beneficial, because both contextual and temporal ambidexterity have their specific benefits as well as drawbacks. Thus this study expands earlier research on the performance outcomes of balancing exploration and exploitation (Lavie et al., 2010) as well as research on the factors moderating this relationship (Lin et al., 2007) by highlighting a number of contingencies that possibly affect the performance implications of either following a contextual or a temporal mode of balancing exploration and exploitation. This study, first, shows that in dynamic environments temporal ambidexterity is comparatively more beneficial than in stable environments. This result complements prior research on the moderating effect of environmental factors on either persuing a more exploration or exploitation-oriented strategy (Jansen, Van Den Bosch, & Volberda, 2005) and on the performance effects of balancing exploration and exploitation (Lin et al., 2007). In contrast, we did not find a clear moderation effect for the second environmental contingency we scrutinized, environmental munificence. In environments that are more munificent neither contextual nor temporal ambidexterity thus seem to have clear comparative benefits. This result may be due to the fact that pressures of environmental selection and reduced availability of resources that are present in more resource scarce environments (Goll & Rasheed, 2005; Jansen et al., 2005) do not only require that new ventures make efficient use of their network management resources but also avoid the potential fluctuations in costs and revenues that are associated with temporal ambidexterity.

Third, our findings partially support the notion that firms' network characteristics are relevant for the performance implications of different approaches to alliance management and formation (Gulati, 1998). We find no significant moderating effect of network size. Rather than the mere quantity of network relationships, it seems to be the particular mix of types of network ties (new versus established) that entails performance consequences. Results reveal that the ratio of exploration and exploitation marginally moderates the relationship between ambidexterity mode and new venture performance. Specifically, we find that with an increasing ratio of new to existing network partners, temporal ambidexterity becomes marginally more beneficial.

Fourth, our findings lend further credence to the notion that characteristics of a firms' management team play a significant role in managing the balance between explorative and exploitative activities (Beckman, 2006; Lavie et al., 2010). Specifically, our results show that entrepreneurs with higher human capital benefit marginally more form engaging in temporal ambidexterity. At the same time, however, our results

indicate that an increase in human capital is less beneficial when realizing contextual ambidexterity. We argued that founders' human capital compensates for the lack of legitimacy that makes temporal ambidexterity problematic. However, future research is needed to analyze in detail how exactly founders' human capital affects their ability to manage more or less effectively the two modes of ambidexterity.

Fifth, our findings underscore that the right teammates are also relevant for being able successfully to manage the challenges involved in ambidexterity (Beckman, 2006). Our results suggest, though only with marginal significance, that both highly homogenous as well as heterogeneous founding teams tend to profit more from temporal ambidexterity, whereas founding teams with a moderate level of homogeneity/heterogeneity profit more from contextual ambidexterity. This finding can potentially help to resolve conflicting results previously generated by Beckman (2006) and Jansen et al. (2008). Based on an analysis of the impact of founders' prior company affiliations on explorative and exploitative behavior, Beckman (2006) suggested that firms with a mixture of homogeneous and heterogeneous founding teams achieve superior performance by means of realizing contextual ambidexterity. In contrast, the findings reported by Jansen et al. (2008) point out that team members' shared vision and understanding is positively associated with a firm's ability to combine high levels of exploration and exploitation. With respect to the ability of more homogenous and mixed founding teams to manage ambidexterity, our results to some extent confirm both of the abovementioned results. In addition, they highlight that homogeneous and heterogeneous founding teams differ with respect to which mode of ambidexterity is most beneficial.

6.6. Conclusion and Limitations

Before concluding, we note some limitations of our study that further research should address. First, the study at hand only captures ambidexterity in the domain of inter-organizational relationships. Future research should thus build on our work and comparatively examine the performance implications of contextual and temporal ambidexterity as well as the factors moderating this link in other domains, such as explorative and exploitative product and innovation strategies.

Second, future research might also address the question of the performance effects of different modes of ambidexterity and their contingencies based on other samples of firms. As already noted above, the fact that we focused on new ventures, which are particularly small in size, may have had a specific impact on our results, in particular with regard to the general positive effect of contextual ambidexterity. Earlier research by Lin et al. (2007) indicates that firm size may moderate the effects of the

balance between exploration and exploitation. It might therefore be that firm size may also play a role for the implications of different modes of ambidexterity.

Third, our dependent variable is binary in nature and represents a rather coarse indicator for the performance of a new venture. While a binary measure for profitability has been shown to be a valid indicator for performance in earlier entrepreneurship research (Dimov, 2010; Diochon et al., 2007; Gatewood et al., 1995), future research might fruitfully employ more fine-grained measures capturing different performance dimensions when assessing the performance implications of different modes of ambidexterity.

Despite these limitations, we believe that the present study makes significant contributions to the extant literature. To the best of our knowledge, our study is one of the first to address the tradeoffs between exploration and exploitation by shedding light on the comparative performance effects of contextual and temporal ambidexterity while controlling for the balance between exploration and exploitation. This clearly contributes to the literature on ambidexterity in inter-organizational relationships (Lavie et al., 2010), as it directly tests the performance implications of alternative modes of balancing exploration and exploitation. Additionally, our study clearly goes beyond earlier research in the field that examined boundary conditions of explorative and exploitative behavior (Lavie et al., 2010; Raisch & Birkinshaw, 2008) by uncovering particular environmental, network, and organizational contingencies that influence the relative performance outcomes of contextual and temporal ambidexterity.

Chapter 7

Overall Findings and Implications

This thesis follows the haunting call for studying the antecedents and outcomes of new ventures network development (Hoang & Antoncic, 2003; Slotte-Kock & Coviello, 2010; Street & Cameron, 2007). Specifically, it addresses the following two questions: 1) Can entrepreneurs pursue new ventures' network development processes and, if so, how? 2) Do network development processes impact new venture performance and, if so, how and why?

In the following, I would like to summarize the answers to these question generated in this thesis.

The studies presented in Chapter two and three contribute to answering the first question. They provide evidence that the entrepreneur can indeed pursue network development processes. Specifically, results indicate that networking skills enable the entrepreneur to develop more and stronger network relationships, which in turn foster a new venture's financial performance. The rationale given for this mediated relationship is that entrepreneurs who are skilled networkers are better able to develop more and stronger relationships, which fosters the quantity, the quality and the variety of resources available through the network. These resources in turn positively influence new venture performance.

However, as also revealed in Chapter two and three, this general relationship is influenced by certain boundary conditions. First, the age of new venture as well as the size of a new venture influence this relationship. Specifically, the older the venture and the bigger the venture is, the less influence can be exerted by the entrepreneurs networking ability, because the venture will on the one hand to a smaller extent depend on external relationships, and on the other hand be better able to attract potential exchange partners.

Additionally, it seems noteworthy that results indicate that the moderating impact of organizational variables on the relation between entrepreneurs networking ability and new venture performance depends on the institutional context the entrepreneur is embedded in. Specifically, the negative moderating effect of venture size is only observable within a stable and highly developed institutional environment, which means that in less developed institutional

contexts entrepreneurs networking ability remains important for a new venture's performance even when it grows.

The studies presented in Chapter four to six address the question whether, how and why network development processes impact new venture performance. In a nutshell, the results presented in these Chapters contribute to answering this question as they indeed provide evidence for a positive association between new venture performance and network development.

More specifically, the study presented in Chapter four provides evidence that network development in terms of adding strategically-selected new ties to a new ventures network after the venture is founded, fosters new venture performance. In particular, these calculative ties contribute to new venture performance by positively influencing new venture's growth in financial performance. The underlying argumentation is that new ventures proceed through different development stages, which represent distinct resource needs. As a result, entrepreneurs have to adapt their network in accordance to these changing needs to secure persistent growth. Results further indicate that the identity-based network, which is made of family and friends, and which a new venture usually starts with, also fosters new venture performance, yet through a different mechanism. In particular it is positively associated with a new ventures initial performance which builds the economic baseline for early stages of new venture development.

The studies presented in Chapter five and six focus on continuous network development processes which take place once a venture is operating. The Study presented in Chapter five underpins that a continuous turnover of a new ventures exchange network through adding new ties (network exploration) fosters a new ventures' financial performance. However, results indicate that it is also valuable to maintain and develop certain newly added network ties for certain periods of time (network exploitation), as this will lead to a more efficient resource exchange. Congruously, results further reveal that cumulating both advantages, new ventures that balance both network development activities achieve superior performance. However, recent research indicates there are two different modes by which this ambidexterity in new venture network development might be reached— temporal ambidexterity and contextual ambidexterity. Picking up this notion, the last study in this thesis comparatively analysis performance effects of these two strategies. Results indicate that while contextually balancing network exploration and exploitation, which comes along with legitimacy and certainty benefits, is generally more beneficial for new ventures, temporal ambidexterity

which comes along with efficiency benefits becomes more favorable under certain conditions, such as environmental dynamism.

Summing up, the core message of this thesis is that entrepreneurs can indeed pursue network development processes which in turn foster their new ventures financial performance. However, the beneficial impact of intentional network development depends on the interplay between the network development strategy the entrepreneur pursues, organizational characteristics of his or her new venture, and the environmental conditions surrounding it.

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Publikationen

Sigmund, S., Semrau, T., & Wegner, D. forthcoming. Networking ability and the financial performance of new ventures: Moderating effects of venture size, institutional environment and their interaction. ***Journal of Small Business Management***.

Semrau, T., & Sigmund, S. forthcoming. Networking ability and the financial performance of new ventures: A mediation analysis among younger and more mature firms. ***Strategic Entrepreneurship Journal***.

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