University of Groningen

The effectiveness of cohesive and diversified networks

Rauch, Andreas; Rosenbusch, Nina; Unger, Jens; Frese, Michael

Published in:
Journal of Business Research

DOI:
[10.1016/j.jbusres.2015.05.011](https://doi.org/10.1016/j.jbusres.2015.05.011)

IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.

Document Version
Publisher's PDF, also known as Version of record

Publication date:
2016

[Link to publication in University of Groningen/UMCG research database](#)

Citation for published version (APA):

Rauch, A., Rosenbusch, N., Unger, J., & Frese, M. (2016). The effectiveness of cohesive and diversified networks: A meta-analysis. *Journal of Business Research*, 69(2), 554–568.
<https://doi.org/10.1016/j.jbusres.2015.05.011>

Copyright

Other than for strictly personal use, it is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license (like Creative Commons).

The publication may also be distributed here under the terms of Article 25fa of the Dutch Copyright Act, indicated by the "Taverne" license. More information can be found on the University of Groningen website: <https://www.rug.nl/library/open-access/self-archiving-pure/taverne-amendment>.

Take-down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Downloaded from the University of Groningen/UMCG research database (Pure): <http://www.rug.nl/research/portal>. For technical reasons the number of authors shown on this cover page is limited to 10 maximum.

The effectiveness of cohesive and diversified networks: A meta-analysis

Andreas Rauch^{a,*}, Nina Rosenbusch^b, Jens Unger^c, Michael Frese^d

^a University of Groningen, Faculty of Economics and Business, Innovation Management & Strategy, Nettelbosje 2, 9747 AE Groningen, The Netherlands

^b Wilfrid Laurier University, School of Business and Economics, 75 University Ave, N2L 3C5, Waterloo, ON, Canada

^c University of Giessen, Otto-Behaghel-Str. 10F, 35394 Gießen, Germany

^d National University of Singapore Business School, Mochtar Riady Building, 15 Kent Ridge Drive, Singapore 119245

ARTICLE INFO

Article history:

Received 1 February 2015

Received in revised form 1 April 2015

Accepted 1 May 2015

Available online 10 June 2015

Keywords:

Cohesive
Diversified
Firm performance
Meta-analysis
Network

ABSTRACT

The entrepreneurship literature recognizes the substantial contributions of networks to firm performance. However, the circumstances under which cohesive versus diversified networks drive firm performance remain unclear. To rectify this situation, the present meta-analysis integrates the results of 68 independent samples ($N = 16,364$). The findings indicate both cohesive and diversified networks relate to performance ($r_c = .164$ and $r_d = .182$). Moderator analyses suggest that diversified networks are particularly effective for large firms, firms competing in innovative industries and in well-developed financial markets. Cohesive networks relate to performance in small firms but not in large firms. These findings suggest that the relationship between networks and performance is context-dependent.

© 2015 Elsevier Inc. All rights reserved.

1. Introduction

The search for predictors of firm performance has a long tradition in the entrepreneurship literature. Beginning in the early 1990s, more and more researchers recognize that entrepreneurs and their firms are embedded in social and exchange relationships with their environment (Hoang & Antoncic, 2003). Such relationships are of strategic significance, enabling firms to successfully exploit opportunities (Elfring & Hulsink, 2007; Granovetter, 1985). Research examines the relationship between network characteristics and entrepreneurial outcomes, such as venture performance (Hoang & Antoncic, 2003). A meta-analysis by Stam, Arzlanian and Elfring (2014) indicates that the overall relationship between network properties and performance is positive and significant ($r = .211$). Thus, meta-analytic evidence confirms the high importance of networks in the entrepreneurial process. The meta-analysis stresses the importance of different network characteristics, such as network size, density, diversity, strong ties and weak ties. Additionally, the results of the meta-analysis by Stam et al. (2014) indicate that the network-performance link is likely to be context-dependent. Thus, applying contingency frameworks when studying this link could provide new insights and advance the academic literature. However, the literature currently leaves many questions unanswered; this context motivates the present study and the resulting additional meta-analytic review of the vast empirical literature on this topic.

While the meta-analysis by Stam et al. (2014) examines different network characteristics that reflect different theoretical perspectives, the study does not make an attempt to integrate the literature by providing a consistent and theoretically-justified framework to classify network characteristics. The literature suggest a number of frameworks to categorize networks (Hoang & Antoncic, 2003; Nahapiet & Ghoshal, 1998). One of the most prominent distinctions differentiates between the entire structure of relationships (Aldrich & Zimmer, 1986) and the quality of relationships people have developed with each other (Batjargal, 2003; Granovetter, 1992; Moran, 2005). However, this distinction is problematic because structural and relational features of networks are not independently defined: rather, they are overlapping. Another categorization refers to network cohesiveness and diversity (Martinez and Aldrich, 2011). This distinction is useful in the context of entrepreneurship because cohesive and diversified networks provide different resource advantages for entrepreneurs and their firms. Additionally, there is no overlap between the two categories as in the case of structural versus relational approaches. Hence, the categorization is more clear-cut. Furthermore, entrepreneurs and managers need to decide the extent to which they invest their limited resources in a cohesive or a diversified network.

Second, cohesive and diversified networks have advantages and disadvantages which could influence the net benefits in specific situations. This suggests that there are moderator variables involved in the relationship between network characteristics and performance. For example, the disadvantages of cohesive networks include the risk of over-embeddedness (Uzzi, 1996), lock in (Johannisson, 2000) and reduced heterogeneity (Westlund & Adam, 2010). All of these disadvantages

* Corresponding author. Tel.: +31 50 363 7178.

E-mail addresses: a.j.rauch@rug.nl (A. Rauch), ninarosenbusch@aol.com (N. Rosenbusch), jens.m.unger@googlemail.com (J. Unger), michfrese@gmail.com (M. Frese).

may limit the benefits of cohesive networks for firms that rely on a large variety of resources, as in the case of firms in innovative industries, for example. Therefore, a contingency framework is useful for examining the circumstances under which cohesive and diversified networks relate to performance. A debate in the network literature is ongoing about the extent to which the relationship between networks and performance is generalizable. While most studies in the networking literature conceptualize a direct relationship between networks and performance (Batjargal, 2003; Collins & Clark, 2003; Davidsson & Honig, 2003), other conceptualizations challenge such a view (Adler & Kwon, 2002).

The theoretical framework here combines arguments from the resource-based view (RBV) with arguments derived from ecological approaches. Networks provide resources and information advantages and, thereby, enforce competitive advantages and increase firm performance. However, the availability of resources is dependent on both networks and the distribution of resources in the environment. A firm which faces a resource constraint in its internal or external environment requires a different type of network than a firm operating in an environment with comprehensive resources. As a consequence, the relationship between networks and performance depends on the resources available in the environment. Furthermore, networks can increase the legitimacy of firms by providing resources that would not be available to the firm without the network. Hence, this study addresses one of the key questions in entrepreneurship research: How do firms create the legitimacy required to successfully compete in a market? Finally, resources at different levels of analysis affect the relationship between networks and performance. For example, Aldrich and Wiedenmayer (1993) point out that the environment affects the availability of resources at the organization level, population level and community level.

This meta-analysis aims to contribute to the existing literature on the relationship between networks and performance in several ways. First, it contributes to the literature on networks by distinguishing between cohesive networks and diversified networks. By integrating various approaches in a consistent framework, the present study extends prior work looking at isolated network characteristics. Second, we investigate the network-performance relationship in a contingency framework. More specifically, we theoretically identify moderator variables that relate to resource constraints in the firms' internal and external environments such as firm size and age, innovative versus non-innovative industries and financial market development. In doing so, the present study responds to calls to investigate networks in a contingency framework (Adler & Kwon, 2002; Martinez & Aldrich, 2011). Third, the contingency framework allows us to investigate the differential impact of cohesive and diversified networks. Hence, the study provides information as to when cohesive or diversified networks are effective or not. Fourth, the study relies on a meta-analysis aiming to estimate the size of the relationship between network characteristics and performance and assess the generalizability of this relationship. While several review articles study networking (Hoang & Antoncic, 2003; Jack, 2010; Westlund & Adam, 2010), they all use narrative methods to examine the role of networks in entrepreneurship research (with the exception of Stam et al., 2014). However, studies examining the relationship between networks and performance predominantly use quantitative designs (Jack, 2010) and, therefore, their results can very well be synthesized by meta-analysis. Finally, methodological moderators might account for some of the variance in reported relationships between networks and performance.

2. The literature on networks

2.1. The concept of networks

Networks can be defined in terms of a set of actors and a set of linkages between these actors (Brass et al., 2004). A network approach to entrepreneurship assumes that firms are embedded in social relationships which affect the entire entrepreneurial process (Aldrich & Zimmer, 1986) and, thus, that entrepreneurial organizations rest on

social constructions. Because this study investigates the effects of networks on firm performance, the conceptualization of networks focuses on the personal network, which encompasses the entrepreneur or top management team as well as the network partners and their connecting ties. Prior research shows that this type of network affects firm-level outcomes (Davidsson & Honig, 2003; Mayer-Haug et al., 2013; Vissa & Chacar, 2009) and that the personal network is an important predictor of firm-level networks (Maurer and Ebers, 2006).

The literature on networks covers a wide range of different network characteristics. A central feature is the distinction between network cohesion and network diversity (Martinez & Aldrich, 2011). Cohesive networks are related to strong ties, cohesion, closure and embedded relationships. The amount of time invested, emotional intensity, intimacy and reciprocal service affect network cohesion (Granovetter, 1973). Cohesive networks encompass strong social relations among members, who are almost exclusively connected to each other. Network diversity refers to contacts with people or institutions that exhibit different attributes and resources (Aldrich & Zimmer, 1986; Batjargal, 2003; McDonald, Khanna, & Westphal, 2008). Diverse networks encompass relationships with low emotional and infrequent contact (Granovetter, 1973), structural holes and broker positions.

This distinction is important, because cohesive and diverse networks provide different types of resource advantages. Cohesive networks ease the access to resources by focusing on solidarity and commitment and, thus, are related to opportunity exploitation. Diverse networks provide access to a wide range of sources of information and diverse points of view (Martinez & Aldrich, 2011). The access to multifaceted information supports the recognition of new opportunities and innovation (Elfring & Hulsink, 2007). Thus, both cohesion and diversity are important in the entrepreneurial process, though they affect different aspects of the entrepreneurial process.

Cohesiveness and diversity are not necessarily antagonists at the conceptual level (Martinez & Aldrich, 2011, p. 9). For example, trusted and coordinated resource exchange might very well occur in diversified networks. Furthermore, cohesive networks do not necessarily prevent the occurrence of innovative ideas (Obstfeld, 2005). Thus, cohesion and diversity are not mutually exclusive. Despite this point, entrepreneurs still need to decide what type of network to build. As they have limited time and financial resources that can be invested into building a network, entrepreneurs are faced with a dilemma: They can either build a small network with strong ties that require a high time commitment or they can rely on a larger, more diverse network with loose ties that require less time commitment. The resolution of this dilemma is related to the decision-maker's objectives (Westlund & Adam, 2010). Consequently, networks need to be arranged in such a way that they sustain the goals and aims of the firm (Batjargal, 2003).

2.2. The relationship between networks and performance

Prior research stresses the role of networks as a collection of resources that provide a competitive advantage to the firm (Combs & Ketchen, 1999; Eisenhardt & Schoonhoven, 1996; Gulati, Nohria, & Faheer, 2000; Lee, Lee, & Pennings, 2001). The RBV argues that a firm's competitive advantage originates in the resources and capabilities the firm controls, specifically those that are valuable, rare, imperfectly imitable and not substitutable (Barney, 1991). Resources obtained through networks share some features consistent with criteria suggested by the RBV. First, networks are valuable, because they are an asset which can be invested in, with the expectation of future rents and advantages that can be generated (Adler & Kwon, 2002). Second, network resources are rare because they are developed in a unique, path-dependent process. Networks also facilitate access to information and knowledge that is not readily available in a market (Gulati et al., 2000). Third, network resources are imperfectly imitable because they are socially constructed and depend on complexity and interconnectivity (Nahapiet & Ghoshal, 1998). Fourth, a network can create non-imitable and non-

substitutable advantages as a resource itself and as a means to access resources (Gulati et al., 2000, p. 207). Hence, network resources are related to competitive advantage and, in turn, to firm performance (Bosma, van Praag, Thurik, & Wit, 2004). Other benefits of networks include the access to important and timely information (Adler & Kwon, 2002), financial support, access to labor and psychological aid (Sanders & Nee, 1996). Furthermore, networks provide opportunities for acquiring and exploiting new knowledge required for innovation (Yli-Renko, Autio, & Sapienza, 2001). They may also transmit positive signals to potential stakeholders willing to invest in the firm or specific projects (Bosma, van Praag, Thurik, & Wit, 2004). Hoang and Antoncic (2003) provide an extensive discussion of the positive effects of networks.

The network literature proposes arguments that both cohesive and diverse networks provide resource advantages and contribute to performance, though the mechanisms and costs associated with each network type differ considerably. The general argument regarding the effects of cohesive networks is the ease of access to resources (Martinez & Aldrich, 2011). For example, friends and family often provide physical and financial resources as well as time and social support (Brüderl and Preisendörfer, 1998). Cohesive networks rely on benevolence, trust and affective commitment (Elfring & Hulsink, 2007). Thus, strong ties and cohesive networks help in developing informal control and, in turn, reduce the time and costs associated with monitoring and control. Additionally, strong ties often offer access to fine-grained information and tacit knowledge (Elfring & Hulsink, 2007). Tacit knowledge, in turn, increases competitive advantages because it is inimitable (Reed & DeFillippi, 1990). However, cohesive networks have disadvantages as well. For example, cohesiveness increases homogeneity and decreases the number of diverse points of view and access to new ideas (Johannisson, 2000). Despite these disadvantages, the number and relevance of the benefits described above suggest that cohesive networks should yield a net benefit for entrepreneurial firms. Hence,

Hypothesis 1. There is a positive relationship between cohesive networks and firm performance.

Burt (2000), among others, argued that efficient networks should provide non-redundant information. Network diversity guarantees non-redundancy of information shared between actors – at least to some degree. In addition to non-redundant information, diverse networks provide more alternative points of view and more novel responses to problems (McDonald et al., 2008) and can therefore be considered an important source of sustained competitive advantage (Barney, 1991). Diverse networks spread the risks involved in opportunity recognition and exploitation, enabling firms to choose the most promising course of action as information about different options becomes available through the network.

The size of a network is also related to network diversity. Large networks tend to be more diversified than small networks. Network size should be positively related to performance because larger networks provide more (non-redundant) resources and information for firms (Baum, Calabrese, & Silverman, 2000; Hansen, 1995). Additionally, larger networks increase the likelihood of locating customers, suppliers, and resource providers. A larger network also allows entrepreneurs to activate an appropriate subset of the total network enabling firms to achieve a specific goal.

Other sources of network diversity relate to the network structure. For example, central network positions allow for a better access to valuable information about opportunities than peripheral positions (Gulati et al., 2000). Moreover, networks rich in structural holes provide non-redundant resources and information, particularly for those firms that are in bridging positions (Burt, 2000). Bridging positions may lead to a competitive advantage because they allow for better access to information, for controlling the flow of information, and for timing benefits. In addition, the invisible nature of ties in sparse networks and the information they provide renders them imperfectly imitable (Gulati et al., 2000). Finally, weak ties that are loose and non-affective (Greve & Salaff, 2003)

create bridges to network segments that are not directly connected with the entrepreneur (Burt, 2000). That increases diversity within the network even further and enables entrepreneurs to access new information which facilitates the creation, recognition and exploitation of new opportunities (Granovetter 1973). Since weak ties allow access to multifaceted information and resources, they support successful opportunity recognition (Elfring & Hulsink, 2007).

The disadvantages of network diversity include governance problems that challenge the effectiveness of diversified networks (Martinez & Aldrich, 2011). Compared to cohesive networks, it is also more difficult to assemble resources in diverse networks. Because the advantages of diverse networks should outweigh their costs there should be a net benefit from diverse networks that results in increased firm performance. Thus,

Hypothesis 2. There is a positive relationship between diversified networks and firm performance.

2.3. The contingencies affecting the value of cohesive and diversified networks

While a contingency approach is not a dominant approach in networks research, some authors argued that the ultimate value of a given form of networks depends on contextual factors (Batjargal, 2010; Elfring & Hulsink, 2007; Leenders and Gabbay, 1999; Martinez & Aldrich, 2011). Whether or not cohesive and diversified networks affect performance depends on the firms' goals and on contingency variables associated with these goals (Martinez & Aldrich, 2011).

The framework for conceptualizing moderators used in this study draws on arguments derived from ecological theorizing (Aldrich & Wiedenmayer 1993). The effectiveness of networks relates to the resources the networks provide for the focal firm. However, the availability of resources is not only dependent on networks but also on the distribution of resources in the internal and external environment. Depending on the availability and distribution of resources in the environment, cohesive and diversified networks might be more or less important for the firm.

Firms face certain liabilities that they need to address in order to compete in a market. Such liabilities occur at the organizational level (internal environment), the population level and the community level (external environment). At the organizational level, firm size and firm age have been argued to create challenges known as liabilities of smallness and newness (Stinchcombe, 1965). These liabilities affect how successfully firms compete for resources. At the population level, innovative industries are characterized by disruptions that affect the availability and distribution of resources and which need to be addressed in order to compete successfully. Finally, at the community level, the efficiency of the financial sector affects the allocation of resources and, in turn, the importance of cohesive and diversified networks.

2.3.1. Organization-level moderator variables: Firm age and firm size

New ventures have a higher likelihood of failure than established firms (Stinchcombe, 1965). This liability of newness is a result of different factors such as the costs of learning, lack of efficient ways of operating, lack of organizational structure, barriers to entry, lack of legitimacy in a market and lack of reliability (Aldrich & Wiedenmayer, 1993; Brüderl & Schussler, 1990; Stinchcombe, 1965). In order to overcome the liability of newness, new ventures need to gain legitimacy in the market. Since legitimacy refers to generalized perceptions of a socially constructed system of norms, values, beliefs and definitions, cohesive networks are prime candidates for creating legitimacy of new firms. For example, key contacts may enable access to institutional support, and strong affiliations help to get access to customers in a market (Elfring & Hulsink, 2007). Moreover, cohesive networks provide resources such as information and financial capital, and they may help

to reduce overhead costs, thus improving the chances of new firms to successfully manage the critical start-up period (Stinchcombe, 1965).

Once a firm matures, its assets become more specialized but less flexible (Amit and Schoemaker, 1993). Hence, established firms face different disadvantages than new ventures such as inertia and cohesion (Aldrich and Auster, 1986). As a result, established firms have a decreased internal diversity, which makes them vulnerable in the long run as it may hurt their ability to create new competitive advantages. Such inertia may lead to ignorance about external information. Additionally, there are external pressures that decrease firm flexibility, for example, when inter-firm arrangements stress the continuation of past practices. In such a situation, cohesive networks further reinforce resistance to change (Johannisson, 2000) and are, therefore, dysfunctional. In order to decrease organizational inertia and to successfully compete in a market, established firms need to build diversified networks. Diverse networks provide less redundant information, more alternative points of view and more novel responses to problems (McDonald et al., 2008). Hence:

Hypothesis 3. The relationship between cohesive networks and performance is stronger for new as compared to established firms.

Hypothesis 4. The relationship between diverse network and performance is stronger for established as compared to new firms.

While firm size is related to firm age, not all new firms start small and not all older firms become large businesses. More importantly, new and small firms are confronted with different liabilities. One problem faced by small firms is their limited access to resources, such as financial and human capital. For example, small firms are less attractive to large investors. Larger organizations not only have fewer problems in raising capital, they often also pay lower interest rates (Aldrich and Auster, 1986). Furthermore, the administrative overhead is disproportionately high in small firms as they do not have specialists housed in their own firm to deal with these issues. Small firms also do not have the resources to afford traditional human resources strategies (Rauch, 2011). Thus, they face a major disadvantage when competing for labor with larger firms.

Cohesive networks help smaller firms to overcome such resource constraints; for example, they help small firms to access capital and potential employees. Large businesses do not suffer from such resource constraints and, therefore, they do not need to rely on cohesive networks to the same extent. However, larger organizations have their own constraints to deal with. For example, large firms are often inflexible and need to address problems of strategic transformation (Aldrich and Auster, 1986). In contrast to cohesive network ties, diverse networks can tackle this issue by bringing a diverse set of new resources into the firm which can help to overcome rigidities. Thus:

Hypothesis 5. The relationship between cohesive networks and performance is stronger for small as compared to large firms.

Hypothesis 6. The relationship between diverse networks and performance is stronger for large as compared to small firms.

2.3.2. Population-level moderator variable: Innovative industries

Innovative industries are characterized by the use of sophisticated and complex technologies, and typically require extensive research and development in environments that are dynamic and uncertain (Khandwalla, 1976; Utterback, 1996). In innovative industries firms cannot rely on existing routines to compete in their market. Therefore, firms lack certainty about the payoffs of specific strategies and resource endowments. While the acquisition of knowledge is critical in innovative industries, the uncertainty in such industries makes it difficult to acquire new knowledge which is useful for the firm (Aldrich and Fiol, 1994). An additional constraint concerns a lack of legitimacy of the activities of firms in innovative industries (Aldrich and Martinez, 2001).

For example, the products and services offered may not have been accepted in the market yet, and firms may not conform to accepted norms and values. Hence, resource providers such as investors and (potential) employees may not be willing to offer them the needed resources due to their perceived uncertainty associated with these firms. At the same time, firms in innovative industries often require relatively large amounts of financial capital and very specific human capital. Hence, access to superior resources is crucial for such firms.

Networking is a useful tool to establish legitimacy in innovative industries and to gain access to required resources. This is particularly true for diversified networks, because diversified networks provide the large pool of knowledge required to operate in such industries. First, diverse networks provide more non-redundant information than non-diverse networks, making it more likely for firms in the network to recognize opportunities resulting from changes in the environment. Second, information reduces the uncertainty (Kirzner, 1997; McMullen and Shepherd, 2006) associated with innovative industries. Third, diverse networks provide information about useful alternative courses of action. Fourth, diversified networks offer the information that helps firms to create internal capabilities required for innovation (Zaheer and Bell, 2005). Finally, diversified networks help to create legitimacy in a market by developing standards and reinforcing positive perceptions about the industry.

Non-innovative industries do not require such diversified information and networks because firms can rely on existing routines. Information about best practices and strategies in an industry is also more readily available. At the same time, firms often face greater competition in non-innovative industries. A cohesive network protects firms from potential constraints in competitive industries (Aldrich & Wiedenmayer 1993). Furthermore, firms in non-innovative industries benefit more from cohesive networks because cohesive networks provide opportunities to access effective knowledge directly (Baum and Oliver, 1992; Reagans and McEvily, 2003). Hence:

Hypothesis 7. The relationship between cohesive networks and performance is stronger in non-innovative industries as compared to innovative industries.

Hypothesis 8. The relationship between diverse networks and performance is stronger in innovative industries as compared to non-innovative industries.

2.3.3. Community-level moderator: Financial market development

The presence of available and affordable financial support and the trustworthiness of this support characterize an efficiently developed financial market. Such a financial market provides and channels financial resources to the most promising entrepreneurial initiatives (Schwab, 2012). Financial resources are important for firm performance because they enable firms to access other valuable resources, such as human resources or physical resources (Barney, 1991). Therefore, an efficient financial market is an important predictor of venture performance (Aldrich & Wiedenmayer 1993).

The absence of an efficient financial market makes it difficult for firms to ensure competitiveness-enhancing investments. In such environments, firms often have to gain access to financial capital informally. Entrepreneurs in countries with less developed financial markets have to rely heavily on family's and friends' money and other sources of bootstrap financing due to the lack of formal institutions which provide financial capital at reasonable prices. Hence, a cohesive network encompassing well-established ties to family and friends can compensate for an unfavorable financial market because it provides direct access to financial resources.

In contrast, diversified networks provide advantages in well-developed financial markets. For many firms, access to formal financial capital is difficult even in well-developed financial markets due to information asymmetries leading to high uncertainty for the providers of financial resources. A diverse network can increase the legitimacy of a

firm and reduce information asymmetries (Higgins and Gulati, 2003; Uzzi, 1997), making it easier to convince formal providers of financial resources to allocate funding to the firm. Furthermore, diverse networks can provide the information required to attain the most efficient financial resources at the best price (Uzzi, 1999). Thus:

Hypothesis 9. The relationship between cohesive networks and performance is stronger in less developed financial markets as compared to developed ones.

Hypothesis 10. The relationship between diverse networks and performance is stronger in developed financial markets as compared to less developed ones.

3. Methods

3.1. Study location procedure

The goal of the study location procedure was to identify all empirical studies that met the selection criteria. Multiple strategies exist to locate studies relevant for a meta-analysis (Glass, McGaw, & Smith, 1981). First, we conducted a key word search in different databases: PsycInfo, SSCI, Business Source Complete and EconLit. In addition, a search in the databases of libraries of two universities identified unpublished master theses and dissertations. The key word search utilized combinations of keywords including the dependent variable (success*, perform*, surviv*, grow*, ROI, profit*, sales, earning*, “firm dissolution”, failure, survival), the social capital variable (“social capital”, “network*”, “social network*”, ties, relation*, contact*, “social resources”, support, connection*, “social interaction”, “social exchange”, alliance*, partner*) and the firms addressed (entrepreneur*, “small business*”, “business owner”, start-up*, venture*, self-employ*, organization*), respectively. The key word search in the databases located 29 studies that met the selection criteria and that were included in the meta-analysis.

The second step was a manual search in the online issues of the following journals: Journal of Business Venturing, Journal of Small Business Management, Entrepreneurship Theory and Practice, International Small Business Journal, Small Business Economics, The International Entrepreneurship and Management Journal, Journal of Entrepreneurship, Journal of International Entrepreneurship, Entrepreneurship and Regional Development, Strategic Entrepreneurship Journal, Organization Science, Academy of Management Journal, and Strategic Management Journal. This process resulted in 20 studies which provided sufficient data to be included in the meta-analysis.

Third, a review of the conference proceedings of the Academy of Management Annual Meetings and the Babson College Entrepreneurship Research Conference led to 5 studies containing the requisite statistics.

A fourth approach was to search the bibliographies of the identified studies for other cited articles that might be useful. This brought 4 more studies into the analysis. The last step was to contact the authors directly to ask for correlation matrices missing in the studies found through the previous research process and also for unpublished material. In total, we contacted 53 authors, 34 of whom responded. Five authors sent useable correlation matrices, and one author sent another unpublished paper which met the selection criteria. In the remaining cases, either the material provided by the authors still did not offer sufficient information or the data were no longer available to the authors. In sum, the study location process resulted in a total of 64 studies and 68 independent samples that fulfilled the inclusion criteria for the meta-analysis (Table 1).

3.2. Selection criteria

To be included in the meta-analysis, the studies had to meet certain selection criteria. First, in order to achieve a comparable level of analysis, the meta-analytic sample only includes studies that investigated

independent, legal units of firms. Second, studies had to assess financial performance at the level of the firm. Thus, the sample does not include studies measuring goal attainment of the individual business owner. Third, the primary studies needed to investigate the personal network of the entrepreneur or top managers, not firm-level networks, such as alliances. Several studies used the same or significantly overlapping samples. In order to avoid bias through the overrepresentation of samples used in different primary studies, five studies were excluded from the analysis (Batjargal, 2006; Lau & Bruton, 2011; Li, 2001; Li and Atuahene-Gima, 2001; Stam, 2010).

Two authors coded the identified studies as to whether they met the selection criteria. Inter-rater agreement was coded as a percentage (Barrick and Mount, 1991), which was 79.4 %. We resolved disagreement by discussion until consensus was obtained.

3.3. Coding of constructs

Networks needed to be coded along the dimensions of cohesiveness and diversity (Martinez & Aldrich, 2011). Table 2 displays the coding scheme used in this study including the frequencies of the indicators that were used. Indicators for cohesive networks include strong ties, a close network structure, network density and ties characterized by trust and emotional support. Many studies measured the frequency (5 times) and the hours spent (5 times) with network contacts, which is an operationalization of tie strength suggested by Granovetter (1985). The majority of studies measured strong ties by assessing the support of family members and close friends (14 times). Less frequently, the authors of the primary studies relied on measuring emotional aspects of closed networks, such as trust (2 times), intimacy (2 times) and emotional support (2 times). Finally, a few studies operationalized network cohesiveness using structural measures, including network closeness (1 time), multiplexity (1 time) and density (1 time).

Measures emphasizing the heterogeneity of network contacts and resources are indicators of network diversity. The most frequently employed indicator was network size (25 times). These studies measured the number of network contacts or used some related measure such as the number of actual contacts divided by the number of possible contacts. Other studies directly assessed weak ties by examining the presence of distant, infrequent contacts (5 times). Further indicators of weak ties were, for example, breadth of network (2 times), network centrality (2 times) and structural holes (2 times). Finally, diversity of partner types, support diversity and heterogeneity of contacts (4 times) present measures of network diversity.

The strength of the relationship between networking and performance might also depend on the type of performance assessment used. Firm performance is a multidimensional construct (Combs, Crook, & Shook, 2005). It is useful to distinguish between financial performance and operational performance: The former is concerned with economic achievements while the latter addresses indicators that might affect economic achievements (Venkatraman & Ramanujam, 1986). This meta-analysis focuses on the questions as to whether or not the benefits of networks lead to economic advantages and thus financial performance (Adler & Kwon, 2002). Financial performance has at least 4 dimensions: returns, growth, stock market performance and productivity (Table 3). In addition, researchers used subjective performance measures which relied on subjective ratings of financial performance such as, for example, indicators comparing performance relative to that of competitors (8 times) (Wiklund & Shepherd, 2005). This categorization is in line with previously published meta-analyses on different performance assessments (Combs et al., 2005; Rosenbusch, Rauch, and Bausch, 2013). The return dimension includes measures such as return on assets (ROA) (7 times), profit (7 times), return on sales (ROS) (2 times), or net income (2 times). Firm growth was used most frequently (39 times) and includes measures such as employment growth (17 times) and sales growth (16 times); the stock market performance dimension contains stock-market related measures such as firm valuation (1 time),

Table 1
Overview of studies included in the meta-analysis.

Study name	Sample size	Effect size	Performance measure	Network measure	Firm age (years)	Firm size (employees)	Country	Type of industry	Quality
(Acquaah & Eshun, 2010)	106	.378	Subjective	Diversified network	24	186	Ghana	Not innovative	High
(Batjargal, 2010)	159	–.05	Growth	Diversified network	3.3	47	China, Russia	Innovative	Low
(Batjargal & Liu, 2004)	67	.440	Growth	Cohesive network, diversified network			China	Not innovative	High
(Batjargal, 2003)	56	.179	Growth, accounting return	Cohesive network, diversified network	9.64		Russia	Not innovative	Low
(Bian, 2002)	188	.220	Accounting return		29.44	559.13	China		Low
(Borch & Huse, 1993)	104	.150	Subjective			45	Norway, Sweden	Not innovative	Low
(Bosma et al., 2004)	1161	.048	Growth, accounting return	Cohesive network	3		Netherlands	Not innovative	High
(Bratkovic, Antoncic, & Ruzzier, 2009)	103	.107	Growth	Cohesive network, diversified network	3.3	2.4	Slovenia	Not innovative	High
(Brinckmann & Hoegl, 2011)	212	.245	Growth		6.85	10	Germany	Innovative	High
Brink, 2011	60	.201	Growth	Diversified network		5.426	Denmark	Not innovative	Low
(Carr, Cole, Ring, & Blettner, 2011)	341	.03	Subjective	Cohesive network	17.79	2.4		Not innovative	Low
(Chrisman & Leslie, 1989)	43	.135	Growth, accounting return	Diversified network		Smaller than 50	USA	Not innovative	Low
(Cochet, Dormann, & Ehrmann, 2008)	208	.51	Subjective	Cohesive network			Germany	Not innovative	Low
(Collins & Clark, 2003)	73	.236	Growth, stock market	Cohesive network, diversified network		1.742	USA	Innovative	High
(Dai & Liu, 2009)	356	.508	Subjective	Diversified network	4.67	50.21	China	Innovative	Low
(Davidsson & Honig, 2003)	380	.089	Accounting return	Cohesive Network, diversified network	Nascent ventures	Small	Sweden	Not innovative	High
(Florin, Lubatkin, & Schulze, 2003)	275	.215	Growth, accounting return	Diversified network	7.22	149.66	USA	Not innovative	Low
(Ge, Hisrich, & Dong, 2009)	177	.127	Subjective	Cohesive Network, diversified network	Younger than 8 years		China	Innovative	Low
(George, Wood, & Khan, 2001)	70	.122	Accounting return	Diversified ties		58.9	USA	Not innovative	High
(Goebel, 1998)	66	.100	Accounting return		2.5	Small	Germany		High
(Grande, Madsen, & Borch, 2011)	168	.212	Subjective			1.7	Norway	Not innovative	High
(Hanlon, 2001)	48	.186	Subjective	Diversified Network			Canada	Not innovative	Low
(Honig, 1998)	215	.010	Accounting return	Cohesive Network	14.36	Less than 10	Jamaica	Not innovative	Low
(Hormiga, Batista-Canino, & Sánchez-Medina, 2011)	130	.161	Subjective	Cohesive Network, diversified network	2.39	8	Spain	Not innovative	Low
(Hsu, 2007)	149	.23	stock market performance	Diversified network		10.09	USA	Innovative	Low
(Jones & Jayawarna, 2010)	211	.246	Growth	Cohesive Network, diversified network		small	United Kingdom	Not innovative	Low
(Keasey, Short, & Watson, 1994)	72	.143	Growth, accounting return		9.972	Small and medium sized	United Kingdom	Not innovative	Low
(Kessler, 2007)	296	.230	Subjective	Cohesive network	Less than 4 years		Austria	Not innovative	Low
(Kessler, 2007)	459	.130	Subjective	Cohesive network	Less than 4 years		Czech Republic	Not innovative	Low

(continued on next page)

Table 1 (continued)

Study name	Sample size	Effect size	Performance measure	Network measure	Firm age (years)	Firm size (employees)	Country	Type of industry	Quality
(Lau & Bruton, 2011)	134	.428	Subjective	Cohesive Network	6.50		China, Russia	Innovative	Low
(D. Y. Lee & Tsang, 2001)	168	.221	Growth	Cohesive Network, diversified network		Small	Singapore	Not innovative	Low
(Lee, Naylor, & Chen, 2011)	269	.53	Subjective	Cohesive network, diversified network	17	15	USA	Innovative	High
(H. Li & Zhang, 2007)	184	.220	Subjective		4.83		China	innovative	Low
(Li, Poppo, & Zhou, 2008)	280	.260	Accounting return	Diversified network			China	Not innovative	High
(Li, Zhou, & Shauo, 2009)	187	.030	Accounting return	Diversified network	9.56	Large	China	Not innovative	High
(Lin, Li, & Chen, 2006)	125	.004	Subjective				Taiwan	Innovative	Low
(Lyles, Saxton, & Watson, 2004)	135	.102	Subjective	Network cohesiveness	5.69	27	Hungary	Not innovative	High
(Madsen, 2007)	168	.143	Growth, subjective			31.94	Norway	Not innovative	High
(McDonald et al., 2008)	225	.077	Accounting return, stock market	Cohesive network, diversified network	Old	Large	USA	Not innovative	High
(Musteen, Francis, & Datta, 2010)	155	.003	Subjective	Cohesive network, diversified network		Less than 230	Czech Republic	Not innovative	High
(Ostgaard & Birley, 1996)	159	.018	Growth, accounting return	Cohesive network, diversified network	6	9.7	United Kingdom	Not innovative	High
(Patel & Terjesen, 2011)	452	.150	Accounting return	Cohesive network, diversified network			USA	Not innovative	Low
(Peng & Luo, 2000)	127	.195	Accounting return	Diversified network		377	China	Not innovative	Low
(Reuber & Fischer, 1998)	98	.226	Growth		10	33	Canada	Not innovative	Low
(Reuber & Fischer, 1998)	48	.252	Growth		19	51	Canada	Not innovative	Low
(Sarder, Gosh, & Rosa, 1997)	161	.243	Growth, productivity		6.45	19.87	Bangladesh	Not innovative	Low
(Sawyer, McGee, & Peterson, 2003)	153	.183	Growth, accounting return	Cohesive network, diversified network	14	31	USA	Not innovative	High
(Shane & Cable, 2002)	202	.145	Accounting return	Cohesive networks, diversified networks			USA	Not innovative	High
(Scholten, 2006)	65	.095	Growth	Cohesive networks, diversified networks	3.2	7.5	Netherlands	Not innovative	Low
(Sheng, Zhou, & Li, 2011)	241	.235	Subjective			Large firms	China	Innovative	High
(Stam & Elfring, 2006)	87	.265	Growth, subjective	Cohesive networks, diversified networks	5		Netherlands	Innovative	High
(Tupinamba, 1999)	101	.126	Growth				Brazil	Not innovative	Low
(Frese & Wang, 2006)	116	.168	Growth				China	Not innovative	Low
(Frese & Wang, 2006)	159	-.095	Growth				Germany	Not innovativ	Low
(Unger, 2006)	88	.375	Growth	Diversified network	8.29		South Africa	Not innovative	Low
(Unger, 2006)	108	.055	Growth, accounting return	Diversified network			Zimbabwe	Not innovative	High
(Uzzi & Gillespie, 2002)	1893	.037	Growth	Cohesive networks, diversified networks	14.08		USA	Not innovative	High
(Vissa & Chacar, 2009)	84	.36	Growth	Diversified network	3.9		India	Innovative	High
(Walter, Auer, & Ritter, 2006)	149	.257	Growth, Profitability		8.3	16	Germany	Not innovative	Low
(Wiklund & Shepherd, 2008)	2253	.095	Subjective	Cohesive networks, diversified networks	4	1.91	Sweden	Not innovative	High
(Wright, Liu, Buck, & Filatotchev, 2008)	349	.007	Growth		4.94	Less than 300	China		Low
(Yli-Renko, Autio, & Tontti, 2002)	56	.087	Growth	Cohesive networks, diversified networks	14.59		Finland	Innovative	Low
(Yli-Renko, Mani, & Sapienza, 2005)	93	-.17	Growth	Cohesive Network	5.82	29.45	Finland	Innovative	High
(Yiu & Lau, 2008)	458	.180	Subjective	Diversified network	17.94	Large firms	China	Not innovative	High
(Zhang & Li, 2008)	163	.074	Growth		5.80	2.83	China	Not innovative	Low
(Zhao, Frese, & Giardini, 2010)	133	.257	Growth	Cohesive networks, diversified networks	5.28	15.1	China	Not innovative	Low
(Zhao et al., 2010)	75	.123	Growth	Cohesive networks, diversified networks	6.94	2.05	China	Not innovative	Low
(Zou, Chen, & Ghauri, 2010)	252	.205	Subjective	Cohesive networks, diversified networks	5.31	<50	China	Innovative	High

Table 2

The coding of cohesive and diversified networks.

Cohesive Networks	N	Diversified Networks	N
Strong ties (support by parents, siblings, offspring, spouses, kin, friends)	14	Network size	25
Hours spent communicating with personal network	5	Weak ties	5
Frequency of interaction/cooperation	5	Network heterogeneity	4
Emotional support	2	Breadth/range of network	3
Perceived trust, reciprocity, and shared goals in personal social ties	2	Centrality	2
Duration, intimacy and meeting frequency	2	Structural holes	2
Semi-weekly church	1	Directors of other firms	1
Network closeness	1	Number of interlocks	1
Extensive personal contacts	1	Arm's length relationships	1
Proportion of close contacts	1	Had any contact with a business advice company	1
Duration of tie	1	Involved in any business network (trade associations, chamber of commerce service clubs)	1
Multiplexity	1	Percentage of distant relationships	1
Density	1	Percentage of personal networks that do not know each other	1
Strong support by parent organization	1	Networks in foreign markets	1
Strong relatedness to parent organization	1	Indirect ties	1
		Brokerage position	1

market-to-book value (1 time) and relative stock performance (1 time). An example for measures of productivity is sales per employee (2 times) and value added per employee (1 time).

With regard to new versus established ventures, there is no agreed upon definition in the literature, possibly because maturity depends on the industry (Covin, Slevin, & Covin, 1990). Previous meta-analyses in the domain of entrepreneurship used an average age of 12 years (Rosenbusch, Brinckmann, & Bausch, 2011) and eight years (Brinckmann, Grichnik, & Kapsa, 2010) as cut-off points. Since primary research also used eight years as a cut off to differentiate between new and established firms (McDougall & Robinson, 1990; Zahra, 1996), the present meta-analysis complies with these suggestions. Robustness checks using 10 and 12 years as cut-off points produced similar results.

Regarding firm size, there are different categorizations defining small-scale enterprises. While the European Union classifies enterprises with less than 50 employees as small-scale companies, the United States Small Business Administration uses larger size standards for different industries. The present study relies on the conservative definition of the European Union to account for the fact that the average firm size across sample firms possibly representing different industries is coded. Hence, 50 employees is the cut off for distinguishing small from large enterprises.

The population-level moderator considered in this meta-analysis is the level of innovativeness in the industry. Innovative industries include technology-based industry, open source software and software development, high technology industries, electronics, and biotechnology.

The measure of financial market development used in this study was based on the Global Competitiveness Report (Schwab, 2012). This

measure consists of eight indicators assessing the efficiency of financial markets (e.g., the availability and affordability of financial services) and the trustworthiness of financial markets (e.g., the soundness of banks). The mean value in the meta-analytic sample (4.66) serves as the cut-off point for the binary analysis.

Finally, binary coding assesses the methodological quality of studies included in the meta-analysis. More specifically, a longitudinal design (22% of samples included were based on a longitudinal design), a peer reviewed journal publication (82% of samples included were published in peer reviewed journals), reliability and validity information provided in the primary study (62% of samples included provided such information), a randomly selected sample (58% of samples included were based on a random sample), and different instruments applied to measure the social capital and the performance variables (80% of samples included suffered from common method variance) served as indicators for superior quality.

3.4. Meta-analytical procedure

The present study relies on a combination of the bivariate meta-analytical procedures suggested by Hunter and Schmidt (2004), and a multivariate regression analysis proposed by Lipsey and Wilson (2001). A bivariate meta-analysis is useful for testing the direct effect hypotheses and allows for effective interpretation. Multivariate regressions enable researchers to test the moderator hypotheses while accounting for interdependencies between moderator variables. Prior meta-analyses are based on the same combination of bivariate and multivariate techniques (for example, Brinckmann et al., 2010; Rosenbusch et al., 2011).

Table 3

The coding of firm financial performance.

Subjective performance	N	Accounting return	N	Growth	N	stock market performance	N	Productivity	N
Multi – item measure perceived performance compared to competitors	8	Return on assets	7	Employment growth	17	One-year stock return	1	Sales per full-time employee	2
Perceived financial performance	6	Profit	7	Sales growth	16	Pre-money valuation	1	Value added per full-time employee	1
Sales growth relative to the industry	3	Return on sales	2	Profit growth	3	Market-to-book value	1		
Multi-item measure on satisfaction with financial performance	3	After tax net income	2	Growth in total assets	2				
Perceived profitability	1	Per capita gross output value	1	Increase in venture valuation	1				
Perceived performance relative to the industry	1	Ebit	1						
		Return on equity	1						

For both analyses, the effect size is the correlation coefficient r . In a first step, there is a need to convert other bivariate statistics into r . Subsequently, we calculated the sample size weighted mean correlation, using on a random effects model. A 95% confidence interval excluding zero indicates that the effect size is significant. The 80% credibility interval assesses the variability of the correlations in the population. A credibility interval excluding zero indicates that more than 90% effect sizes in the population will exclude zero. Furthermore if 75% or more of the observed variance is explained by sampling error variance, the results suggest homogeneous effect sizes (Hunter & Schmidt, 2004). The 75% rule is a robust indicator of the presence or absence of moderators in meta-analyses (Sagie & Koslowsky, 1993).

If the results indicated heterogeneity, we tested categorical moderators by dividing the studies into subsets of studies. A z -test assesses the significance of the difference in effect sizes between subsets and therefore the presence of a moderator effect. Furthermore, the fail-safe N (Rosenthal, 1979) provides information about the number of hypothetical studies with null results that would need to be added to reduce the effect size to the point of non-significance. Hence, the fail-safe N offers information about the spuriousness of results (Lipsey & Wilson, 2001). In addition, we corrected the overall effect size for unreliability. Since a number of studies did not report reliabilities, the average reliability across studies that provide this information is the best estimate (Hunter & Schmidt, 2004). The average reliability for network measures was .79 (based on 40 measures), and the average reliability of performance was .84 (based on 19 measures).

A multivariate meta-analytical regression accounts for interdependencies between the moderator variables when testing the proposed contingency effects. Thus, it provides more conservative estimates of moderator effects (Lipsey & Wilson, 2001). Furthermore, meta-analytical regression analyses enable researchers to include control variables in the equation. In the meta-analytical regression, the effect size of the direct relationship between social capital and performance is the dependent variable whereas the focal moderator and control variables serve as independent variables. In order to use the effect size (r_w) as the dependent variable in a meta-analytical regression analysis, it needs to be Z -transformed. We performed fixed-effect weighted least squares (WLS) regression analysis, in which each study effect size was weighted with the inverse-variance weight.

The first meta-analytical regression predicts the overall relationship between networking and performance. In a next step, the results of meta-analytical regressions predicting the relationships between cohesive networks and firm performance and the relationship between diversified networks and firm performance indicate whether there is support for Hypotheses 3, 5, 7 and 9 and for Hypotheses 4, 6, 8 and 10, respectively. A quality index and the type of performance assessment (subjective vs. objective, and accounting returns vs. growth, stock market performance and productivity) served as control variables. To determine whether the proposed model was significant, we used between-groups heterogeneity analysis as suggested by Lipsey and Wilson (2001). This procedure assesses both the significance of the regression model and the variability in unexplained effect sizes.

4. Results

Table 4 shows the results of the bivariate meta-analyses. The sample size-weighted and reliability-corrected mean correlation between networks and performance was $r_c = .18$; and the 95% confidence interval of the sample size-weighted correlation ranged from .12 to .18. This correlation is positive and significant and can be considered as a small effect. Yet the results were heterogeneous as sampling error explained only 23.92 % of the observed variance, indicating that moderators may influence the relationship.

In order to test Hypotheses 1 and 2, we classified the studies based on whether they addressed cohesive and diversified networks.

Hypothesis 1 proposed that there is a positive relationship between cohesive networks and performance. 32 studies ($N = 10,625$) examined cohesive networks and the sample size and reliability-corrected correlation was $r_c = .16$. This effect size was significant and, therefore, Hypothesis 1 was supported. There is also support for the hypothesis that diversified networks are positively correlated with performance (Hypothesis 2) ($r_c = .18$). The variance of both effect sizes indicates heterogeneity.

4.1. Contingency variables

Hypothesis 3 proposes that cohesive networks are more important for new as compared to established enterprises. The bivariate meta-analysis revealed that the effect of cohesive networks was positive and significant for new enterprises ($r_c = .17$), while cohesive networks were not related to performance for established firms ($r_c = .09$, ns.). However, the difference in these effect sizes was not significant ($z = 1.35$, n.s.). Moreover, the meta-analytical regression analysis (Table 5) revealed that the effect of firm age was not significant ($B = -.05$, ns.). Therefore, the data does not support Hypothesis 3.

Hypothesis 4 proposed that diversified networks are more important for established as compared to new enterprises. Table 4 shows that the relationship between diversified networks and performance was $r_c = .16$ for new firms and $r_c = .20$ for established firms. However, the difference between the two effect sizes was not significant ($z = 0.62$, ns.). In addition, the meta-analytical regression (Table 5) indicated that the effect of firm age on the relationship between diversified networks was only significant at a moderate significance level ($B = .10$, $p < .10$). Therefore, Hypothesis 4 is rejected.

Hypothesis 5 predicted that cohesive networks are more important for small firms as compared to large firms. As Table 4 indicates, the effect size of cohesive networks was higher for small firms ($r_c = .18$) as compared to large firms ($r_c = .12$). Moreover, the confidence interval for the sub-sample of large firms included zero and, therefore, the effect was not significant for large firms. However, the difference between these effect sizes was not significant in the bivariate analysis ($z = 0.32$, ns.). Therefore, Hypothesis 5 was not supported. This result has to be interpreted with caution, however, because only three studies tested the relationship between cohesive networks and performance for large firms. For this reason, we could not test this moderator variable in the meta-analytical regression equation.

Hypothesis 6 predicted that diversified networks are more important for large as compared to small firms. The bivariate analyses indicate that the effect is significantly stronger in large firms ($r_c = .31$) compared to small firms ($r_c = .16$). According to the meta-analytical regression displayed in Table 5, firm size was also a significant and positive predictor of the effect size for diversified networks ($B = .10$, $p < .05$). Therefore, the data supports Hypothesis 6.

Neither bivariate nor multivariate analyses supported the hypothesis that cohesive networks are more important in non-innovative industries (Hypothesis 7). Specifically, the regression coefficient in the equation of cohesive networks (Table 5) was not significant ($B = -.05$, ns.). However, industry conditions seem to have an influence on the benefits from diverse networks as the effect is significantly higher ($z = 1.87$, $p < .10$) in innovative industries ($r_c = .31$) as compared to non-innovative industries ($r_c = .16$). The effect of innovative industries was also positive and significant in the meta-analytical regression equation predicting the relationship between diversified networks and performance ($B = .13$, $p < .05$). Therefore, Hypothesis 8 was supported.

Hypotheses 9 and 10 relate to the moderating influence of financial market development. Financial market development was not significant in the meta-analytical regression equation predicting the relationship between cohesive networks and performance ($B = .05$, ns.). However, financial market development predicted the relationship between diversified networks and performance positively ($B = .09$, $p < .05$). It is

Table 4

Weighted correlations between social capital and performance: Main effect and moderator analysis.

	K	N	r_w	r_c	So	Se	Sampling error (% variance)	80% Credibility interval	95% Confidence interval	Sign. test	Fail safe N
Networking	68	16,364	.148	.182	.0167	.0040	23.92	.004–.293	.118–.179		9188
Cohesive networks	32	10,625	.139	.164	.0137	.0029	21.17	.005–.272	.098–.179	0.34	2360
Diversified networks	40	10,392	.149	.182	.0170	.0037	21.79	.001–.296	.108–.189		3684
New firm	28	8645	.137	.168	.0139	.0031	22.67	.004–.269	.093–.180	0.10	1629
Established firm	19	4932	.141	.173	.0210	.0037	17.66	–.028–.310	.076–.206		779
Cohesive network– new firm	18	6636	.136	.167	.0075	.0026	34.82	.046–.226	.096–.176	1.35	613
Cohesive network – established firm	7	2939	.072	.088	.0129	.0024	18.39	–.060–.203	–.012–.156		
Diversified network – new firm	16	5174	.130	.159	.0197	.0030	15.24	–.036–.295	.061–.199	0.62	623
Diversified network – established firm	11	3618	.163	.200	.0181	.0029	15.97	.005–.321	.083–.242		445
Small firm	36	7562	.144	.177	.0144	.0046	31.82	.017–.271	.105–.183	2.23*	1708
Large firm	13	2426	.238	.293	.0179	.0048	26.74	.091–.385	.166–.311		537
Cohesive network–small firm	17	5021	.144	.177	.0076	.0033	42.86	.059–.228	.102–.185	0.32	381
Cohesive network – large firm	3	370	.100	.123	.0323	.0080	24.81	–.100–.300	–.103–.303		
Diversified network – small firm	20	5113	.129	.158	.0192	.0038	19.79	–.030–.288	.068–.189	2.19*	727
Diversified network – large firm	9	1877	.253	.311	.0203	.0042	20.76	.091–.416	.160–.347		334
Innovative firms	16	2731	.202	.248	.0315	.0054	17.21	–.001–.409	.115–.289	1.39	543
Non-innovative firms	51	13,445	.136	.168	.0131	.0037	27.95	.012–.261	.105–.168		4819
Cohesive network – innovative industries	7	872	.194	.238	.0299	.0075	25.07	.002–.386	.066–.322	1.00	71
Cohesive network – non-innovative industries	24	9301	.125	.153	.0122	.0025	20.49	–.001–.251	.081–.169		1265
Diversified network – innovative industries	9	1393	.256	.314	.0358	.0057	15.85	.033–.478	.132–.379	1.87†	223
Diversified network – non-innovative industries	31	8999	.132	.162	.0124	.0033	26.82	.010–.254	.093–.171		2057
Financial market development high	37	10,544	.127	.156	.0145	.0034	23.49	–.008–.262	.088–.166	1.70†	2527
Financial market development low	27	5082	.181	.222	.0168	.0050	29.78	.042–.320	.132–.230		1467
Cohesive network – financial market development high	18	8193	.119	.146	.0110	.0021	19.42	–.002–.240	.070–.167	0.60	692
Cohesive network – financial market development low	12	1957	.146	.179	.0167	.0059	35.38	.013–.279	.073–.219		187
Diversified network financial market development high	23	7463	.122	.150	.0127	.0030	23.64	–.004–.248	.076–.168	2.56*	1197
Diversified network financial market development low	16	2770	.232	.285	.0209	.0052	24.85	.071–.393	.161–.303		685
Longitudinal design	15	3712	.114	.140	.0117	.0040	33.68	.001–.228	–.060–.169	1.31	248
Cross-sectional design	53	12,652	.158	.194	.0183	.0040	21.89	.005–.311	.122–.195		6345
Published studies	56	15,186	.151	.185	.0162	.0035	21.79	.006–.295	.117–.184	0.73	7610
Unpublished studies	12	1178	.117	.144	.0227	.0100	44.05	–.027–.262	.032–.202		63
Provided reliability and validity information = Yes	42	11,002	.171	.209	.0194	.0036	18.65	.010–.332	.129–.213	2.24*	5166
Provided reliability and validity information = No	26	5362	.102	.126	.0127	.0048	37.51	–.012–.217	.059–.146		552
Random sample	39	11,731	.119	.147	.0232	.0032	13.96	–.062–.301	.072–.167	2.89**	2504
Non-random sample	28	4532	.224	.274	.0204	.0056	27.56	.068–.379	.171–.276		1997
Common method bias	52	13,179	.161	.198	.0210	.0038	17.90	–.007–.329	.122–.200	1.79†	6684
No common method bias	13	2809	.103	.126	.0084	.0046	53.87	.023–.183	.053–.153		156
Type of performance assessment	22	6854	.202	.248	.0204	.0030	14.55	.033–.371	.143–.262	2.67***a	2380
1. Subjective performance											
2. Accounting returns	17	4368	.109	.133	.0049	.0038	78.63	.067–.150	.075–.142	2.69***b	316
3. Growth	35	7336	.098	.120	.0124	.0047	38.05	–.014–.210	.061–.135		1142
4. Stock market	3	447	.161	.196	.0042	.0064	154.09		.088–.234		11
5. Productivity	2	319	.301	.372	.0003	.0054	1970.60		.280–.326		19

Note. † $p < .10$. * $p < .05$. ** $p < .01$. K = number of samples. N = sample size. r_w = sample size corrected mean correlations. r_c = reliability corrected and sample size weighted mean effect size. So = observed variance. Se = sampling error variance. Sign. test = significance test. ^a 1 versus 2, ^b 1 versus 3.

noteworthy that the bivariate analysis seems to suggest the opposite. However, the result for developed financial markets is largely driven by two large-sample outliers which decrease the effect size in this sub-sample significantly. As the multivariate analyses also accounts for interdependencies between moderator variables it is more robust than bivariate analyses. Hence, we conclude that the data supports [Hypothesis 10](#).

Overall, the regression of the relationship between diversified networks and performance explained 71% of the variance and the regression of the relationship between diversified networks and performance explained 45% of the variance. In other words, the identified moderators explained a substantial amount of the variance in effect sizes in the present analysis.

Table 5

Meta-regression results on tests of moderators of the relationships between networks and performance.

	Overall Network		Diversified		Cohesive ¹	
Quality assessment	–.329**		.082	–.846**	.152	–.200
Subjective performance	.228**		.037	.231**	.045	.170*
Return	–.054		.047	–.022	.074	–.066
Firm size	.096**		.036	.105*	.051	
Firm age	–.060		.033	.103†	.053	–.048
Innovative industries	.018		.043	.127*	.057	–.053
Financial market development	.087**		.032	.086*	.041	.050
R ²		.52		.71		.45
Q _B		99.98**		100.53**		14.90*
Q _E		92.16**		40.47**		17.91**
K		31		18		13

Note. Coefficients are unstandardized B and corrected standard errors. Q_B indicates the significance of the regression model. Q_E indicates significant variability in effect sizes that remains unexplained. K denoted the number of studies included. ¹ Firm size is not included in this equation because cohesive networks were only studied three times for large-scale enterprises. † $p < .10$. * $p < .05$. ** $p < .01$.

4.2. Post-hoc analyses

An outlier analysis can help to detect possible bias in the results. Excluding studies whose correlation coefficients were more than two standard deviations above or below the mean correlation did not reveal significant differences in effect sizes in the bivariate analyses. The sample size-corrected effect size of cohesive networks decreased by .02 and the effect size of network diversity also decreased by .02. Both changes were not significant. In the regression analysis on diversified networks, the results became even stronger as the significance levels on several coefficients increased. Hence, the results seem to be robust.

Additionally, we tested whether or not the proposed moderators affect the overall relationship between networks and performance when not differentiating between cohesive and diversified networks. The bivariate analyses identified one significant moderator effect (Table 4): the relationship between networks and performance was higher for large firms ($r_c = .29$) as compared to small firms ($r_c = .18$), and the difference between these effect sizes was significant ($z = 2.23$, $p < .05$). The multivariate regression analyses displayed in Table 5 indicated that firm size ($B = .10$, $p < .01$) and financial market development ($B = .08$, $p < .01$) moderate the overall relationship between networks on performance. Notably, the explained variance in this regression equation was considerably smaller than the variance explained by the equation predicting the relationship between diversified networks and performance. This result seems to indicate that it is worthwhile to differentiate between diversified and cohesive networks.

4.3. Methodological moderators

The two remaining questions that need to be addressed refer to the effects of different performance assessments and the quality of studies included in the meta-analysis. Clearly, the relationship between networking and performance depends on the type of performance assessment. The results indicated that the relationship between networks and performance is higher for subjective performance measures compared to objective ones. This is evident in bivariate analyses where the effect size of subjective performance is higher ($r_c = .25$) than the effect size of accounting return ($r_c = .13$, $z = 2.67$, $p < .01$) and the effect size of growth indicators ($r_c = .120$, $z = 2.69$, $p < .01$). Moreover, all the meta-analytical regression analyses replicated this result.

The results also indicate that the methodological moderators account for a significant amount of explained variance. The aggregated quality assessment entered in the meta-analytical regression equations revealed that high methodological quality was negatively associated with the effect size of the relationship between overall network and performance ($B = -.33$, $p < .01$) as well as with the effect size between diversified networks and performance ($B = -.86$, $p < .01$). We performed separate bivariate analyses in an attempt to uncover the quality assessment that most strongly account for these effects. These results indicate that studies based on a random samples reported significantly lower correlations between networking and performance ($r_c = .15$) than other studies ($r_c = .27$, $z = 2.89$, $p < .01$). In addition, studies providing information about reliabilities and validity reported higher effect sizes ($r_c = .21$) compared to studies providing no such information ($r_c = .13$, $z = 2.24$, $p < .05$).

5. Discussion

Academic interest in the relationship between networks and venture performance has exploded in recent years. Yet despite the increasing interest in networks and their impact on outcomes, there is still considerable confusion in the literature about the role of different network characteristics, such as cohesive networks and diversified networks, and moderators that affect the relationship between networks and performance. The present meta-analysis revealed that both cohesive networks and diversified networks have positive effects on venture

performance ($r_c = .16$ and $r_c = .18$, respectively). Although these effect sizes are small by statistical standards (Cohen, 1977), the sample size-weighted correlation is similar to the effect size reported by Stam et al., (2014) and they are as high as, for example, the relationship between innovation and performance (Rosenbusch et al., 2011). In the course of a narrative review, Aldrich and Zimmer (1986) argued that networks can be considered as an alternative to personality predictors of entrepreneurship and entrepreneurial success. But the results presented here question this contention. Task-relevant personality dimensions are more highly correlated with venture success than networking (Rauch & Frese, 2007). This shows how important it is to produce meta-analyses in the area of entrepreneurship because wrong conclusions can easily be drawn from narrative reviews (Frese, Bausch, Schmidt, Rauch, & Kabst, 2012).

The effect sizes of cohesive and diversified networks were found to be heterogeneous, indicating that the relationship between networking and performance is moderated by third variables. The relationship between diversified networks and performance was stronger in large enterprises as compared to small firms; in innovative industries as compared to non-innovative industries; and in efficient financial markets as compared to less developed financial markets. Thus, there are consistent indicators suggesting that the effects of diversified networks need to be examined within a contingency framework. While we found that cohesive networks were related to performance in small firms, cohesive networks were not related to performance in established and large firms. However, the analyses did not produce consistent findings for moderator effects related to the availability and distribution of resources in the internal and external environment. This could be due to power deficits because network cohesiveness has been studied less frequently than diversified networks. An alternative explanation would be that other moderator variables are responsible for the variance in the relationship between network cohesiveness and firm performance. For example, cohesive networks may help introverted new business owners to attract resources; however, diversified networks may even be more efficient for extraverted new business owners. Future research should consider using additional moderator variables.

The fact that subjective performance perceptions create stronger effects than objective performance measures may signal problems in primary studies. Subjective performance assessments might be associated with problems such as social desirability and memory bias which could lead to an overestimation of effects. There are additional methodological problems associated with the size of relationships between networks and performance. The results of this meta-analysis indicate that studies relying on non-random samples produce higher effect sizes than studies based on random samples. It is reasonable to assume that the effect of random samples comes closer to the true effect size. Finally, studies that reported quality criteria of their measurements reported higher effect sizes than studies not providing such information. In this case, it is possible that low reliabilities account for the low effect sizes in these studies. Such methodological problems in primary studies may have contributed to the inconsistent findings reported in the network literature (Jack, 2010). All these problems call for higher methodological standards in network research.

5.1. Theoretical implications

The results of this research contribute to the ongoing debate in the literature in several ways. First, this meta-analysis provides an estimate of the strength of the relationship between networks and performance. In general, the effect sizes identified are not high enough to suggest that venture performance is solely dependent on bundles of relationships. At the same time, the effect sizes are strong enough to derive theoretical and practical recommendations. Second, the present study presents an extension to the meta-analytical findings of Stam et al., (2014) by testing the differential outcomes of cohesive and diversified networks. Although cohesive and diversified networks yield similar effect sizes

the conditions under which they pay off in terms of increased firm performance differ. Hence, this study points to the necessity of contingency frameworks when studying the effects of cohesive and diverse networks. Interestingly, the majority of studies in the network literature have not included moderators in their design. We found that the effect of diversified networks depends on firm age, industry and financial market development. Many previous studies examined either single industries or used type of industry as a control variable. The same is true for firm age. The presented findings suggest that these variables should be conceptualized as moderator variables as there is reason to believe that the impact of networking depends on several aspects of the internal and external environment (Martinez & Aldrich, 2011). These environmental moderator effects occur at different levels of the environment, including the organization level (firm size), the population level (innovative industry) and the community level (financial market development). Hence, future research should aim at integrating different levels of the environment discussed in the literature on networks (Elfring & Hulsink, 2007; Martinez & Aldrich, 2011; Peng & Luo, 2000). Additionally, the results on cohesive networks are heterogeneous, suggesting that moderator variables influence effect sizes here as well; but these moderators need to be identified in future research.

The present meta-analysis also contributes to the entrepreneurship literature. Entrepreneurial firms, such as new and small businesses and firms operating in innovative industries, need to adopt a different network strategy than large and established firms and firms in less innovative industries. Thus, the literature in the domain of entrepreneurship needs to develop frameworks that consider different resource and information requirements of entrepreneurial firms. The finding that diversified networks become more important for large firms might indicate that network requirements change during a firm's life cycle. This also suggests that it might be useful to address the process involved in unfolding the effects of networks.

5.2. Limitations and future research

The first limitation refers to the exclusive reliance on quantitative data. Notably, the majority of primary studies on the relationship between networks and performance used quantitative designs (Jack, 2010). However, an exclusive reliance on quantitative designs is particularly problematic when focusing on the evolution of networks and also when assessing the structure of networks and network content (Jack, 2010). For example, perceptual measures of networks assume that the participant is consciously aware of his or her network contacts. However, one is not necessarily aware of indirect network contacts that are established through someone occupying a bridging position. Such measurement problems may have contributed to the heterogeneity of results regarding the relationship between network structure and performance.

Second, the present study focused on financial performance, although networks may also contribute to other operational aims. For example, networks might effectively support innovation and access to know-how. Innovation, in turn, affects performance (Rosenbusch et al., 2011). Thus, future research should link networks to operational aims as well (Venkatraman & Ramanujam, 1986). Such research would also allow an examination of the processes and mechanisms by which networks affect performance. In addition, the effects of networks on firm performance might depend on timing, firm life cycle or changing network content (Hoang & Antoncic, 2003). Understanding these network dynamics would advance the academic debate on this topic. Furthermore, the presented results can serve as a benchmark to which the results of more fine-grained studies can be compared.

Third, a considerable share of variance across studies remained unexplained in this meta-analysis. This indicates that additional moderators may exist. At the same time, networking is only one way to access resources. Future research should investigate how networks interact with other resources such as, for example, human capital, financial

capital, organizational capital, and technological resources. It would also be interesting to investigate whether networking compensates for the lack of other resources or whether different sets of resources reinforce each other. In addition, the effectiveness of networks might also depend on the quality of the opportunity (Shane, 2003), because networks can help entrepreneurs exploit a good start-up idea effectively.

Fourth, the study analyzes the cohesiveness and diversity dimensions of the network construct. Notably, the literature provides multiple conceptualizations of networks (Adler & Kwon, 2002; Nahapiet & Ghoshal, 1998; Yli-Renko et al., 2001). Due to the nature of a meta-analysis the aim here was to analyze network characteristics that are in the focus of a sufficient number of studies. However, because of data limitations the conceptualization of networks does not cover some issues discussed in the literature, such as network content or the development of networks (Jack, 2010).

Another issue relates to the limitations inherent in the primary studies which are transferred to the meta-analysis. For example, all primary studies in this meta-analysis examine the performance of surviving firms, producing a survivor bias. Such inclusiveness might result in a reduced variance in performance, which in turn could reduce correlations in the studies (Hunter & Schmidt 2004). Therefore, generalizing the findings to surviving firms is necessary.

5.3. Practical implications

In spite of these limitations, the results of the present meta-analysis support some practical recommendations. Small and new firms usually start by relying on a small and cohesive network. Such networks are useful and increase business performance. For example, the results suggest that the success rate of firms with cohesive networks is 58%, while the success rate of firms without cohesive networks is only 42% (Rosenthal, 1979). However, once an enterprise grows and matures, diversified networks become more and more important. Since cohesive networks are not important for large and established firms, entrepreneurs should reallocate their resources to develop large and diversified networks. The number of simultaneously maintainable ties constrains network cohesiveness; diversified ties do not suffer from such constraints. Therefore, diversified networks should become more prevalent in larger enterprises. The same applies for innovative industries and efficient financial markets. By diversifying the network considering these circumstances, firms can increase their financial performance significantly. Thus, firms should build their networks depending on resource and information requirements in their environment.

Acknowledgement

The authors thank Petra Zinsberger and Sebastian Mol for their help during the research process.

References

- Acquaah, M., & Eshun, J.P. (2010). A longitudinal analysis of the moderated effects of networking relationships on organizational performance in a sub-Saharan African economy. *Human Relations*, 63(5), 667–700. <http://dx.doi.org/10.1177/0018726709342928>.
- Adler, P.S., & Kwon, S.-W. (2002). Social capital: Prospects for a new concept. *Academy of Management Review*, 27(1), 17–40.
- Aldrich, H., & Auster, E. R. (1986). Even dwarfs started small: Liabilities of age and size and their strategic implications. *Research in Organizational Behavior*, 8, 165–198.
- Aldrich, H. E., & Fiol, C. M. (1994). Fools rush in? the institutional context of industry creation. *The Academy of Management Review*, 19(4), 645–670.
- Aldrich, H. E., & Martinez, M. A. (2001). Many are called, but few are chosen: An evolutionary perspective for the study of entrepreneurship. *Entrepreneurship Theory and Practice*, 25(4), 293–311.
- Aldrich, H.E., & Wiedenmayer, G. (1993). From traits to rates: An ecological perspective on organizational foundations. In J. Katz, & R. Brockhaus (Eds.), *Advances in Entrepreneurship, Firm Emergence, and Growth*, Vol. 1. (pp. 145–195). Greenwich, CT: JAI Press.
- Aldrich, H.E., & Zimmer, C. (1986). Entrepreneurship through social networks. In D.L. Sexton, & W. Smilor (Eds.), *The art and science of entrepreneurship* (pp. 2–23). Cambridge, MS: Ballinger.

- Amit, R., & Schoemaker, P. J. H. (1993). Strategic assets and organizational rent. *Strategic Management Journal*, 14(1), 33–46.
- Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17(1), 99–120.
- Barrick, M. R., & Mount, M. K. (1991). The big five personality dimensions and job performance: A meta-analysis. *Personnel Psychology*, 44(1), 1–26.
- Batjargal, B. (2003). Social capital and entrepreneurial performance in Russia: A longitudinal study. *Organization Studies*, 24(4), 535–556.
- Batjargal, B. (2010). The effects of network's structural holes: Polycentric institutions, product portfolio, and new venture growth in China and Russia. *Strategic Entrepreneurship Journal*, 4(2), 146–163 <http://dx.doi.org/10.1002/sej.88>.
- Batjargal, B. (2006). The dynamics of entrepreneurs' networks in a transitional economy: The case of Russia. *Entrepreneurship and Regional Development*, 18, 305–320.
- Batjargal, B., & Liu, M.M. (2004). Entrepreneurs access to private equity in China: The role of social capital. *Organization Science*, 15(2), 159–172 <http://dx.doi.org/10.1287/orsc.1030.0044>.
- Baum, J. A. C., & Oliver, C. (1992). Institutional embeddedness and the dynamics of organizational populations. *American Sociological Review*, 57(4), 540–559.
- Baum, J.A.C., Calabrese, C., & Silverman, B.S. (2000). Don't go it alone: Alliance network composition and startups' performance in Canadian biotechnology. *Strategic Management Journal*, 21(3), 267–294 [http://dx.doi.org/10.1002/\(SICI\)1097-0266\(200003\)](http://dx.doi.org/10.1002/(SICI)1097-0266(200003)).
- Bian, Y. (2002). Social capital of the firm and its impacts on performance: A social network analysis. In A.L. Tsui, & C.-M. Lau (Eds.), *Management of enterprises in People's Republic of China* (pp. 275–297). London: Kluwer Academic Publishers.
- Borch, O.J., & Huse, M. (1993). Informal strategic networks and the board of directors. *Entrepreneurship Theory & Practice*, 18(1), 23–36 (doi: Retrieved from EBSCOhost).
- Bosma, N., van Praag, M., Thurik, R., & Wit, G. D. (2004). The value of human and social capital investments for the business performance of startups. *Small Business Economics*, 23(3), 227–236.
- Brass, D. J., Galaskiewicz, J., Greve, H. R., & Tsai, W. (2004). Taking stock of networks and organizations: A multilevel perspective. *The Academy of Management Journal*, 47(6), 795–817.
- Bratkovic, T., Antoncic, B., & Ruzzier, M. (2009). Strategic utilization of entrepreneur's resource-based social capital and small firm growth. *Journal of Management and Organization*, 15(4), 486–499 <http://dx.doi.org/10.5172/jmo.15.4.486>.
- Brinckmann, J., Grichnik, D., & Kapsa, D. (2010). Should entrepreneurs plan or just storm the castle? A meta-analysis on contextual factors impacting the business planning-performance relationship in small firms. *Journal of Business Venturing*, 25(1), 24–40 <http://dx.doi.org/10.1016/j.jbusvent.2008.10.007>.
- Brinckmann, J., & Hoegl, M. (2011). Effects of initial teamwork capability and initial relational capability on the development of new technology-based firms. *Strategic Entrepreneurship Journal*, 5(1), 37–57 <http://dx.doi.org/10.1002/sej.106>.
- Brink, T. (2011). What connections in networks of private entrepreneurs are related to growth? *Journal of Depopulation and Rural Development*, 11, 57–82.
- Bruederl, J., & Schussler, R. (1990). Organizational mortality: The liabilities of newness and adolescence. *Administrative Science Quarterly*, 35(3), 530–547.
- Brüderl, J., & Preisendörfer, P. (1998). Network support and the success of newly founded business. *Small Business Economics*, 10(3), 213–225.
- Burt, R.S. (2000). The network structure of social capital. *Research in Organizational Behavior*, 22, 345–423.
- Carr, Jon C., Cole, Michael S., Ring, J. Kirk, & Blettner, Daniela P. (2011). A measure of variations in internal social capital among family firms. *Entrepreneurship: Theory and Practice*, 35(6), 1207–1227 <http://dx.doi.org/10.1111/j.1540-6520.2011.00499.x>.
- Chrisman, J.J., & Leslie, J. (1989). Strategic, administrative, and operative problems: The impact of outsiders on small firm performance. *Entrepreneurship: Theory and Practice*, 13(3), 37–51.
- Cochet, Olivier, Dormann, Julian, & Ehrmann, Thomas (2008). Capitalizing on franchisee autonomy: Relational forms of governance as controls in idiosyncratic franchise dyads. *Journal of Small Business Management*, 46(1), 50–72 <http://dx.doi.org/10.1111/j.1540-627X.2007.00231.x>.
- Cohen, J. (1977). *Statistical power analysis for the behavioral sciences*. New York: Academic Press.
- Collins, C.J., & Clark, K.D. (2003). Strategic human resource practices, top management team social networks, and firm performance: The role of human resource practices in creating organizational competitive advantage. *Academy of Management Journal*, 46(6), 740–751.
- Combs, J.G., Crook, T.R., & Shook, C.L. (2005). The dimensionality of organizational performance and its implications for strategic management research. In D.J. Ketchen, & D.D. Bergh (Eds.), *Research methodology in strategic management* (pp. 259–286). San Diego, CA: Elsevier.
- Combs, J.G., & Ketchen, D.J. (1999). Explaining interfirm cooperation and performance: Toward a reconciliation of predictions from the resource-based view and organizational economics. *Strategic Management Journal*, 20(9), 867–888 [http://dx.doi.org/10.1002/\(sici\)1097-0266\(199909\)20:9<867::aid-smj55>3.0.co;2-6](http://dx.doi.org/10.1002/(sici)1097-0266(199909)20:9<867::aid-smj55>3.0.co;2-6).
- Covin, J.G., Slevin, D.P., & Covin, T.J. (1990). Content and performance of growth seeking strategies: A comparison of small firms in high- and low-technology industries. *Journal of Business Venturing*, 5(6), 391–412.
- Dai, Ou., & Liu, Xiaohui (2009). Returnee entrepreneurs and firm performance in Chinese high-technology industries. *International Business Review*, 18(4), 373–386 <http://dx.doi.org/10.1016/j.ibusrev.2009.03.004>.
- Davidsson, P., & Honig, B. (2003). The role of social and human capital among nascent entrepreneurs. *Journal of Business Venturing*, 18(3), 301–332 [http://dx.doi.org/10.1016/S0883-9026\(02\)00097-6](http://dx.doi.org/10.1016/S0883-9026(02)00097-6).
- Eisenhardt, Kathleen M., & Schoonhoven, Claudia Bird (1996). Resource-based view of strategic alliance formation: Strategic and social effects in entrepreneurial firms. *Organization Science*, 7(2), 136–150.
- Elfring, T., & Hulsink, W. (2007). Networking by entrepreneurs: patterns of tie formation for emerging organizations. *Organization Studies*, 28(12), 1849–1872.
- Florin, J., Lubatkin, M., & Schulze, W. (2003). A social capital model of high-growth ventures. *Academy of Management Journal*, 46(3), 374–384.
- Frese, M., Bausch, A., Schmidt, P., Rauch, A., & Kabst, R. (2012). Evidence-based entrepreneurship (EBE): Cumulative science, action principles, and bridging the gap between science and practice. *Foundations and Trends in Entrepreneurship*, 8(1), 1–62.
- Frese, M., & Wang, Z.-M. (2006). Psychological factors of entrepreneurial success in China and Germany. *Technical report*. Giessen: University of Giessen.
- Ge, B., Hisrich, R.D., & Dong, B. (2009). Networking, resource acquisition, and the performance of small and medium sized enterprises: An empirical study of three major cities in China. *Managing Global Transitions*, 7(3), 221–239.
- George, G., Wood, D.R., & Khan, R. (2001). Networking strategy of boards: Implications for small and medium-sized enterprises. *Entrepreneurship & Regional Development*, 13(3), 269–285 <http://dx.doi.org/10.1080/08985620110058115>.
- Glass, G.V., McGaw, B., & Smith, M.L. (1981). *Meta-analysis in social research*. Beverly Hills, CA: Sage.
- Goebel, S. (1998). Persönlichkeit, Handlungsstrategien und Erfolg [Personality, action strategies, and success]. In M. Frese (Ed.), *Erfolgreiche Unternehmensgründer [Successful start-ups]* (pp. 99–122). Göttingen, Germany: Verlag fuer Angewandte Psychologie.
- Grande, Jorunn, Madsen, Einar Lier, & Borch, Odd Jarl (2011). The relationship between resources, entrepreneurial orientation and performance in farm-based ventures. *Entrepreneurship & Regional Development: An International Journal*, 23(3), 89–111.
- Granovetter, M.S. (1973). The strength of weak ties. *American Journal of Sociology*, 78(6), 1360–1380.
- Granovetter, M.S. (1985). Economic actions and social structures: The problem of embeddedness. *The American Journal of Sociology*, 91, 481–510.
- Granovetter, M.S. (1992). Problems of explanation in economic sociology. In N. Nohria, & R. Eccles (Eds.), *Networks and organizations: Structure, form and action*. Boston: Harvard Business School Press.
- Greve, A., & Salaff, J.W. (2003). Social networks and entrepreneurship. *Entrepreneurship Theory & Practice*, 28(1), 1–22.
- Gulati, R., Nohria, N., & Faheer, A. (2000). Strategic networks. *Strategic Management Journal*, 21(3), 2003–2015.
- Hanlon, D. (2001). Vision and support in new venture start-ups. In W.D. Bygrave, E. Autio, C.G. Brush, P. Davidsson, P.G. Green, P.D. Reynolds, & H.J. Sapienza (Eds.), *Frontiers of entrepreneurship research* (pp. 263–275). Babson Park, MA: Babson College.
- Hansen, E.L. (1995). Entrepreneurial networks and new organization growth. *Entrepreneurship Theory & Practice*, 19(4), 7–19.
- Higgins, M. C., & Gulati, R. (2003). Getting off to a good start: The effects of upper echelon affiliations on underwriter prestige. *Organization Science*, 14(3), 244–263.
- Hoang, H., & Antoncic, B. (2003). Network-based research in entrepreneurship: A critical review. *Journal of Business Venturing*, 18(2), 165–187 [http://dx.doi.org/10.1016/S0883-9026\(02\)00081-2](http://dx.doi.org/10.1016/S0883-9026(02)00081-2).
- Honig, B. (1998). What determines success? Examining the human, financial, and social capital of Jamaican microentrepreneurs. *Journal of Business Venturing*, 13(5), 371–394 [http://dx.doi.org/10.1016/S0883-9026\(97\)00036-0](http://dx.doi.org/10.1016/S0883-9026(97)00036-0).
- Hormiga, Esther, Batista-Canino, Rosa M., & Sánchez-Medina, Agustín (2011). The impact of relational capital on the success of new business start-ups. *Journal of Small Business Management*, 49(4), 617–638 <http://dx.doi.org/10.1111/j.1540-627X.2011.00339.x>.
- Hsu, D.H. (2007). Experienced entrepreneurial founders, organizational capital, and venture capital funding. *Research Policy*, 36, 722–741 <http://dx.doi.org/10.1016/j.respol.2007.02.022>.
- Hunter, J.E., & Schmidt, F.L. (2004). *Methods for meta-analysis: Correcting error and bias in research findings*. Newbury Park, CA: Sage.
- Jack, S.L. (2010). Approaches to study networks: Implications and outcomes. *Journal of Business Venturing*, 25(1), 120–137 <http://dx.doi.org/10.1016/j.jbusvent.2008.10.010>.
- Johannisson, B. (2000). *Networking and entrepreneurial growth*. Oxford: Blackwell Publishers Ltd.
- Jones, O., & Jayawarna, D. (2010). Resourcing new businesses: Social networks, bootstrapping and firm performance. *Venture Capital*, 12(2), 127–152 <http://dx.doi.org/10.1080/13691061003658886>.
- Keasey, K., Short, H., & Watson, R. (1994). Directors' ownership and the performance of small and medium sized firms in the U.K. *Small Business Economics*, 6(3), 225–236.
- Kessler, A. (2007). Success factors for new businesses in Austria and the Czech Republic. *Entrepreneurship and Regional Development*, 19(3), 381–403 <http://dx.doi.org/10.1080/08985620701439959>.
- Khandwalla, P. N. (1976). Some top management styles, their context and performance. *Organization and Administrative Sciences*, 7(4), 21–51.
- Kirzner, I. M. (1997). Entrepreneurial discovery and the competitive market process: An Austrian approach. *Journal of Economic Literature*, 35(1), 60–85.
- Lau, C.M., & Bruton, G.D. (2011). Strategic orientations and strategies of high technology ventures in two transition economies. *Journal of World Business*, 43(3), 371–380 <http://dx.doi.org/10.1016/j.jwb.2010.07.011>.
- Lee, A., Lee, K., & Pennings, J.M. (2001). Internal capabilities, external networks, and performance: A study of technology-based ventures. *Strategic Management Journal*, 22(6–7), 615–640 <http://dx.doi.org/10.1002/smj.181>.
- Lee, Ruby P., Naylor, Gillian, & Chen, Qimei (2011). Linking customer resources to firm success: The role of marketing program implementation. *Journal of Business Research*, 64(4), 394–400 <http://dx.doi.org/10.1016/j.jbusres.2010.10.004>.

- Lee, D.Y., & Tsang, E.W.K. (2001). The effects of entrepreneurial personality, background and network activities on venture growth. *Journal of Management Studies*, 38(4), 583–602 <http://dx.doi.org/10.1111/1467-6486.00250>.
- Leenders, R. T. A. J., & Gabbay, S. M. (1999). *Corporate social capital and liability*. Boston: Kluwer Academic Publishers.
- Li, H. (2001). How does new venture strategy matter in the environment - performance relationship? *Journal of High Technology Management Research*, 12, 183–204.
- Li, H., & Atuahene-Gima, K. (2001). Product innovation strategy and the performance of new technology ventures in China. *Academy of Management Journal*, 44(6), 1123–1134.
- Li, J.J., Poppo, L., & Zhou, K.Z. (2008). Do managerial ties in China always produce value? Competition, uncertainty, and domestic vs. foreign firms. *Strategic Management Journal*, 29(4), 383–400 <http://dx.doi.org/10.1002/smj.665>.
- Li, H., & Zhang, Y. (2007). The role of managers' political networking and functional experience in new venture performance: Evidence from China's transition economy. *Strategic Management Journal*, 28, 791–804 <http://dx.doi.org/10.1002/smj>.
- Li, J.J., Zhou, K.Z., & Shauo, A.T. (2009). Competitive position, managerial ties, and profitability of foreign firms in China: An interactive perspective. *Journal of International Business Studies*, 40(2), 339–352 <http://dx.doi.org/10.1057/jibs.2008.76>.
- Lin, B.-W., Li, P.-C., & Chen, J.-S. (2006). Social capital, capabilities, and entrepreneurial strategies: A study of Taiwanese high-tech new ventures. *Technological Forecasting and Social Change*, 73, 168–181 <http://dx.doi.org/10.1016/j.techfore.2004.12.001>.
- Lipsey, M.W., & Wilson, D.B. (2001). *Practical meta-analysis*. London: Sage.
- Lyles, M.A., Saxton, T., & Watson, K. (2004). Venture survival in a transitional economy. *Journal of Management*, 30(3), 351–375 <http://dx.doi.org/10.1016/j.jm.2003.03.001>.
- Madsen, E.L. (2007). The significance of sustained entrepreneurial orientation on performance of firms - A longitudinal analysis. *Entrepreneurship & Regional Development*, 19(2), 185–204 <http://dx.doi.org/10.1080/08985620601136812>.
- Martinez, M. A., & Aldrich, H. E. (2011). Networking strategies for entrepreneurs: Balancing cohesion and diversity. *International Journal of Entrepreneurial Behaviour and Research*, 17(1), 7–38.
- Maurer, I., & Ebers, M. (2006). Dynamics of social capital and their performance implications: Lessons from biotechnology start-ups. *Administrative Science Quarterly*, 51(2), 262–292.
- Mayer-Haug, K., Read, S., Brinckmann, J., Dew, N., & Grichnik, D. (2013). Entrepreneurial talent and venture performance: A meta-analytic investigation of SMEs. *Research Policy*, 42(6–7), 1251–1273.
- McDonald, M.L., Khanna, P., & Westphal, J.D. (2008). Getting them to think outside the circle: Corporate governance, CEOs' external advice networks, and firm performance. *Academy of Management Journal*, 51(3), 353–375.
- McDougall, P.P., & Robinson, P.B. (1990). New venture strategies: An empirical identification of eight "archetypes" of competitive strategies of entry. *Strategic Management Journal*, 11(6), 447–467 <http://dx.doi.org/10.1002/smj.4250110604>.
- McMullen, J. S., & Shepherd, D. A. (2006). Entrepreneurial action and the role of uncertainty in the theory of the entrepreneur. *Academy of Management Review*, 31(1), 132–152.
- Moran, P. (2005). Structural vs relational embeddedness: Social capital and managerial performance. *Strategic Management Journal*, 26(12), 1129–1151 <http://dx.doi.org/10.1002/smj.486>.
- Musteen, M., Francis, J., & Datta, D.K. (2010). The influence of international networks on internationalization speed and performance: A study of Czech SMEs. *Journal of World Business*, 45(3), 197–205 <http://dx.doi.org/10.1016/j.jwb.2009.12.003>.
- Nahapiet, J., & Ghoshal, S. (1998). Social capital, intellectual capital, and the organizational advantage. *Academy of Management Review*, 23, 242–266.
- Obstfeld, D. (2005). Social networks, the tertius lungen orientation, and involvement in innovation. *Administrative Science Quarterly*, 50(1), 100–130.
- Ostgaard, T.A., & Birley, S. (1996). New venture growth and personal networks. *Journal of Business Research*, 36, 37–50.
- Patel, Pankaj C., & Terjesen, Siri (2011). Complementary effects of network range and tie strength in enhancing transnational venture performance. *Strategic Entrepreneurship Journal*, 5(1), 58–80 <http://dx.doi.org/10.1002/sej.107>.
- Peng, M.W., & Luo, Y. (2000). Managerial ties and firm performance in a transition economy: The nature of a micro-macro link. *Academy of Management Journal*, 43(3), 486–501 <http://dx.doi.org/10.2307/1556406>.
- Rauch, A. (2011). The human resource practices of small businesses: An examination of performance implications. In Cary L. Cooper, & Ronald J. Burke (Eds.), *Human resource management in small business: Achieving peak performance* (pp. 111–127). Cheltenham and UK: Edward Elgar.
- Rauch, A., & Frese, M. (2007). Let's put the person back into entrepreneurship research: A meta-analysis of the relationship between business owners' personality traits, business creation and success. *European Journal of Work and Organizational Psychology*, 16(4), 353–385 <http://dx.doi.org/10.1080/13594320701595438>.
- Reagans, R., & McEvily, B. (2003). Network structure and knowledge transfer: The effects of cohesion and range. *Administrative Science Quarterly*, 48(2), 240–267.
- Reed, R., & DeFillippi, R.J. (1990). Causal ambiguity, barriers to imitation and sustainable competitive advantage. *Academy of Management Review*, 15(1), 88–102.
- Reuber, R.A., & Fischer, E. (1998). High growth/low growth industry differences in patterns of job creation by SMEs: The impact of social capital. In P.D. Reynolds, W.D. Bygrave, N.M. Carter, S. Manigart, C.M. Mason, G.D. Meyer, & K.G. Shaver (Eds.), *Frontiers of entrepreneurship research* (pp. 414–425). Babson Park, MA: Babson College.
- Rosenbusch, N., Brinckmann, J., & Bausch, A. (2011). Is innovation always beneficial? A meta-analysis of the relationship between innovation and performance in SMEs. *Journal of Business Venturing*, 26(4), 441–457.
- Rosenbusch, N., Rauch, A., & Bausch, A. (2013). The mediating role of entrepreneurial orientation in the task environment–performance relationship: A meta-analysis. *Journal of Management*, 39(3), 633–659.
- Rosenthal, R. (1979). The file drawer problem and tolerance for null results. *Psychological Bulletin*, 86, 368–461 <http://dx.doi.org/10.1037/0033-2909.86.3.638>.
- Sagie, A., & Koslowsky, M. (1993). Detecting moderators with meta-analysis: An evaluation and comparison of techniques. *Personnel Psychology*, 46(3), 629–640.
- Sanders, J.M., & Nee, V. (1996). Immigrant self-employment: The family as social capital and the value of human capital. *American Sociological Review*, 61(2), 231–249.
- Sarder, J.H., Gosh, D., & Rosa, P. (1997). The importance of support services to small enterprise in Bangladesh. *Journal of Small Business Management*, 35(2), 26–36.
- Sawyer, O.O., McGee, J., & Peterson, M. (2003). Perceived uncertainty and firm performance in SMEs. *International Small Business Journal*, 21(3), 269–290 <http://dx.doi.org/10.1177/02662426030213002>.
- Scholten, V.E. (2006). *The early growth of academic spin-offs: Factors influencing the early growth of Dutch spin-offs in the life sciences, ICT and consulting*. Doctorate thesis Wageningen University.
- Schwab, K. (2012). Global competitiveness report 2011–2012. *Geneve: World Economic Forum; World Economic Forum*.
- Shane, S. (2003). *A general theory of entrepreneurship: The individual-opportunity nexus*. Cheltenham, UK: Edward Elgar.
- Shane, S., & Cable, D. (2002). Network ties, reputation, and the financing of new ventures. *Management Science*, 48(3), 364–381 <http://dx.doi.org/10.1287/mnsc.48.3.364.7731>.
- Sheng, S., Zhou, K.Z., & Li, J.J. (2011). The effects of business and political ties on firm performance: Evidence from China. *Journal of Marketing*, 75(1), 1–15.
- Stam, W. (2010). Industry event participation and network brokerage among entrepreneurial ventures. *Journal of Management Studies*, 47(4), 625–653.
- Stam, W., & Elfring, T. (2006). Entrepreneurial orientation and new venture performance: The mediating effect of network strategies. *Academy of Management Best Paper Proceedings [ENT Division]*, Atlanta, GA.
- Stam, W., Arzlanian, S., & Elfring, T. (2014). Social capital of entrepreneurs and small firm performance: A meta-analysis of contextual and methodological moderators. *Journal of Business Venturing*, 29(1), 152–173.
- Stinchcombe, A.L. (1965). Social structures and organizations. In J.G. March (Ed.), *Handbook of organizations* (pp. 142–193). Chicago: Rand McNally.
- Tupinamba, A.C.R. (1999). *Der Zusammenhang von Persönlichkeitseigenschaften, Strategien und Erfolg bei Kleinunternehmen [The relationship between personality characteristics, strategies, and success of small scale enterprises]* Doctoral Dissertation. Giessen, Germany: University of Giessen.
- Unger, J. (2006). *Entrepreneurial success: The role of human capital and learning*. ((Doctoral thesis) Giessen, Germany: University of Giessen.
- Utterback, J. (1996). *Mastering the dynamics of innovation: How companies can seize opportunities in the face of technological change*. Boston and MA: Harvard Business School Press.
- Uzzi, B. (1999). Embeddedness in the making of financial capital: How social relations and networks benefit firms seeking financing. *American Sociological Review*, 64(4), 481–505.
- Uzzi, B., & Gillespie, J.J. (2002). Knowledge spillover in corporate financing networks: Embeddedness and the firm's debt performance. *Strategic Management Journal*, 23(7), 595–618 <http://dx.doi.org/10.1002/smj.241>.
- Venkatraman, N., & Ramanujam, V. (1986). Measurement of business performance in strategy research: A comparison of approaches. *Academy of Management Review*, 11, 801–814.
- Vissa, B., & Chacar, A.S. (2009). Leveraging ties: The contingent value of entrepreneurial teams' external advice networks on Indian software venture performance. *Strategic Management Journal*, 30(11), 1179–1191 <http://dx.doi.org/10.1002/smj.785>.
- Walter, A., Auer, M., & Ritter, T. (2006). The impact of network capabilities and entrepreneurial orientation on university spin-off performance. *Journal of Business Venturing*, 21(4), 541–567 <http://dx.doi.org/10.1016/j.busvent.2005.02.005>.
- Westlund, H., & Adam, F. (2010). Social capital and economic performance: A meta-analysis of 65 studies. *European Planning Studies*, 18(6), 893–919 <http://dx.doi.org/10.1080/09654311003701431>.
- Wiklund, J., & Shepherd, D. (2005). Entrepreneurial orientation and small business performance: A configurational approach. *Journal of Business Venturing*, 20(1), 71–91.
- Wiklund, J., & Shepherd, D.A. (2008). Portfolio entrepreneurship: Habitual and novice founders, new entry, and mode of organizing. *Entrepreneurship Theory & Practice*, 32(4), 701–725 <http://dx.doi.org/10.1111/j.1540-6520.2008.00249.x>.
- Wright, M., Liu, X., Buck, T., & Filatotchev, I. (2008). Returnee entrepreneurs, science park location choice and performance: An analysis of high-technology SMEs in China. *Entrepreneurship: Theory and Practice*, 32(1), 131–155 <http://dx.doi.org/10.1111/j.1540-6520.2007.00219.x>.
- Yiu, D.P., & Lau, C.-M. (2008). Corporate entrepreneurship as resource capital configuration in emerging market firms. *Entrepreneurship: Theory and Practice*, 32(1), 37–57 <http://dx.doi.org/10.1111/j.1540-6520.2007.00215.x>.
- Yli-Renko, H., Autio, E., & Sapienza, H. (2001). Social capital, knowledge acquisition, and knowledge exploitation in young technology-based firms. *Strategic Management Journal*, 22(6–7), 587–613 <http://dx.doi.org/10.1002/smj.183>.
- Yli-Renko, H., Autio, E., & Tontti, V. (2002). Social capital, knowledge, and the international growth of technological-based new firms. *International Business Review*, 11, 279–304.
- Yli-Renko, H., Mani, D., & Sapienza, H. (2005). *Exporting, social capital, and the survival of young, technology-based firms. Paper presented at the Academy of Management Conference*. Hawaii: Honolulu.
- Zaheer, A., & Bell, C. G. (2005). Benefiting from network position: Firm capabilities, structural holes, and performance. *Strategic Management Journal*, 26(9), 809–825.
- Zahra, S.A. (1996). Technology strategy and new venture performance: A study of corporate-sponsored and independent. *Journal of Business Venturing*, 11(4), 289–321.

- Zhang, S., & Li, X. (2008). Managerial ties, firm resources, and performance of cluster firms. *Asia Pacific Journal of Management*, 25, 615–633<http://dx.doi.org/10.1007/s10490-008-9090-7>.
- Zhao, X. -Y., Frese, M., & Giardini, A. (2010). Business owners' network size and business growth in China: The role of comprehensive social competency. *Entrepreneurship & Regional Development*, 22(7/8), 675–705<http://dx.doi.org/10.1080/08985620903171376>.
- Zou, H., Chen, X., & Ghauri, P. (2010). Antecedents and consequences of new venture growth strategy: An empirical study in China. *Asia Pacific Journal of Management*, 27(3), 393–421<http://dx.doi.org/10.1007/s10490-009-9157-0>.