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Beyond environmental scarcity: Human and social capital as driving forces of bootstrapping activities

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ABSTRACT

Although entrepreneurship scholars highlight bootstrapping as a key resource acquisition approach to respond to the inherent resource constraints that nascent ventures face, little is known about what causes nascent ventures to engage in bootstrapping. Theory highlights the environment as an important determinant of bootstrapping activity. Analyzing bootstrapping behavior of 298 nascent ventures, we find that beyond perceived environmental factors, individual characteristics of the nascent entrepreneurs and factors relating to the embeddedness of the entrepreneurs in the environment determine their venture's bootstrapping behavior. In a more fine-grained analysis we gain insights into how these antecedents shape the use of particular bootstrapping strategies. Findings contribute to our understanding of factors driving resource management approaches in nascent ventures.

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1. Executive summary

The acquisition of resources to pursue the identified opportunities is a key challenge in the entrepreneurial process. Entrepreneurship scholars highlight the importance of bootstrapping as a key resource acquisition approach to respond to the inherent resource constraints that nascent ventures face. Drawing on extant literature, we view bootstrapping as an alternative resource management approach directed at avoiding market-based resource transactions (Ebben and Johnson, 2006; Harrison et al., 2004; Venkataraman, 2003; Winborg and Landström, 2001). Hence, bootstrapping can enable nascent firms to pursue business opportunities, which go beyond means/end combinations, that would be achievable based on conventional market transactions.

However, little is known about what causes nascent ventures to engage in bootstrapping. Extant scholarly work suggests that environmental and organizational antecedents explain bootstrapping activity (e.g., Ebben, 2009; Harrison et al., 2004; Van Auken, 2005), as exemplified by initial findings that the utilization of bootstrapping methods decreases when ventures mature (Ebben and Johnson, 2006). This suggests that bootstrapping is an approach driven by environmental necessities, leaving little room for entrepreneurial agency.

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In this paper, we theorize and subsequently scrutinize about the relevance of an individual's human capital (entrepreneurial and managerial experiences as well as academic education) and social capital (further distinguishing strong ties and weak ties) in addition to perceived environmental characteristics for bootstrapping behavior.

Analyzing bootstrapping behavior of 298 nascent ventures, we find that the use of bootstrapping strategies in nascent ventures is an individualistic choice of entrepreneurs beyond what a venture's environment dictates. As such, our findings supplement the recently developing literature stream that views entrepreneurs as agents who seek to overcome the bounded capacities of their ventures and avoid resource dependencies (Edelman and Yli-Renko, 2010; Haynie et al., 2010). We find that nascent entrepreneurs with greater levels of human capital in different areas employ more bootstrapping activities. Entrepreneurs with managerial experience and those who have pursued higher levels of academic education or specific business training engage in bootstrapping to a greater extent. This shows that both specific direct experiences and education can affect bootstrapping. However, surprisingly, we do not discover any impact of prior entrepreneurial experience. It appears that with regard to preferences and abilities to engage in bootstrapping or engage in alternative resource acquisition approaches, entrepreneurial experience does not have a strong impact. Moreover, we discover interesting findings regarding the social capital of nascent entrepreneurs. Nascent entrepreneurs draw especially on their weak tie network for bootstrapping activities, but not on their strong tie network. Hence, our result supplements and nuances previous research stating that nascent entrepreneurs with more contacts are more likely to launch and successfully establish new ventures (De Carolis et al., 2009). As expected, we find that perceived hostile business environments or with insufficient access to external financial capital lead to a higher propensity of engaging in bootstrapping activities. This suggests that accessing resources through bootstrapping strategies supplements market-based resource acquisition strategies in nascent ventures.

The central finding of our study is that nascent ventures not only engage more in bootstrapping activities in environments perceived as hostile, but also when the entrepreneurs have higher levels of social and human capital. This aligns with recent insights from the entrepreneurship literature implying that bootstrapping is not a matter of last resort (Winborg, 2009). Nascent ventures' bootstrapping activities are largely a result of the entrepreneurs' individualistic backgrounds. Our conclusion advocates that entrepreneurs have decisive influence on the destiny of their nascent ventures and should be placed center stage in the strategy-formulation process in which bootstrapping appears to play a central role (Foss et al., 2008; Holcomb et al., 2009).

2. Introduction

The entrepreneurship and strategic management literature stipulates that resource management is a key factor for initial survival and subsequent progress of organizations, especially in a context of environmental dynamism and resource scarcity (e.g., Brush et al., 2001; Sirmon and Hitt, 2003). Purposeful resource management can optimize the way that resources are acquired, integrated, and deployed to cope with resource dependencies in a unique manner (Pfeffer and Salancik, 1978; Sirmon et al., 2007).

Nascent firms in the process of establishing new means/end relationships in the marketplace are inherently confronted with a dynamic and resource scarce business context (Davidsson and Honig, 2003). During the turbulent phase of organizational emergence, most nascent firms have to overcome the initial lack of substantial managerial, financial, organizational, and physical resources, which is usually supplemented by the burden of lacking legitimacy in the eyes of important resource providers (Stinchcombe, 1965; Wiklund et al., 2010). These circumstances limit the bargaining power of nascent firms, resulting in unfavorable resource dependencies (Ebben and Johnson, 2006; Packalen, 2007; Pfeffer and Salancik, 1978; Stinchcombe, 1965). Therefore, confronted with an unfavorable point of departure for competing on the resource markets, nascent firms must attract, develop, and utilize – that is, manage – their resources in purposeful ways (e.g., Bhidé, 1992; Brush et al., 2001).

Despite the immediate relevance of resource management for the survival and subsequent growth of nascent ventures, little is known about adequate resource management approaches in this context. Nonetheless, the entrepreneurship literature introduced the concept of bootstrapping as an approach to mitigate resource dependencies (e.g., Freear et al., 1995; Winborg and Landström, 2001). Reconciling the multitude of prior descriptions of the bootstrapping phenomenon, we view bootstrapping as an alternative resource management approach directed at avoiding market-based resource transactions (Ebben and Johnson, 2006; Harrison et al., 2004; Venkataraman, 2003; Winborg and Landström, 2001). Hence, bootstrapping can enable nascent firms to pursue business opportunities, which go beyond means/end combinations, that would be achievable based on conventional market transactions.

Main contributions in the bootstrapping literature relate to establishing typologies for bootstrapping activities (Freear et al., 1995; Winborg and Landström, 2001). Some studies created an initial understanding concerning how the utilization of different bootstrapping methods changes over the organization's life cycle (Ebben and Johnson, 2006) and how it relates to a venture's growth (Vanacker et al., 2011). Extant scholarly work suggests that environmental and organizational antecedents explain bootstrapping activity (e.g., Ebben, 2009; Harrison et al., 2004; Van Auken, 2005), as exemplified by initial findings that the utilization of bootstrapping methods decreases when ventures mature (Ebben and Johnson, 2006). This suggests that bootstrapping is an approach driven by environmental necessities, leaving little room for entrepreneurial agency. However, strategy focused entrepreneurship literature suggests that the entrepreneurs have an important role in determining a nascent firm's trajectory (Edelman and Yli-Renko, 2010; Haynie et al., 2010). Hence, questions arise whether firms' bootstrapping activities are mere responses to environmental demands or if bootstrapping is used beyond environmental conditions as a conscious or unconscious, yet characteristic, approach that reflects the background of the founders.

With the current study, we aim to contribute to the scholarly understanding of bootstrapping by scrutinizing how the founders' backgrounds shape bootstrapping activities in nascent firms. Therefore, this analysis follows prominent literature that

sees nascent firms as extensions of their founders and entrepreneurs as the driving force of strategic decisions and actions in their firms (Chandler and Hanks, 1994). Our analysis offers three main contributions to the literature.

First, we strive to contribute to a better understanding of the bootstrapping phenomenon. Theoretical arguments refer to bootstrapping as an innovative resource management activity in the earliest phases of firm development, but empirical analyses predominantly analyze bootstrapping in young or small incumbent firms. However, resource scarcity, resource dependence, and unfavorable terms of market resource exchange likely are most pronounced when the firm is not yet existent, and the fledging entrepreneur is struggling to establish the firm. Therefore, this study focuses specifically on bootstrapping activities deployed in nascent firms. By analyzing bootstrapping in nascent ventures, we seek a better understanding of associated resource management behaviors and its antecedents. By comparing different bootstrapping conceptions and measurements in diverging contexts, we further aim to establish a core understanding of the bootstrapping phenomenon and to depict its contextual dependence.

Second, we evaluate specific environmental antecedents that affect bootstrapping behavior in the nascent venture context. Following resource dependency theory, we investigate the effects of the founders' perceived environmental munificence and their social capital. In particular, we add to extant literature by comparing the effects of strong and weak ties of entrepreneurs on bootstrapping behavior, which allows us to identify the type of resource access or lack thereof that thrusts nascent ventures into bootstrapping. In addition, we further explore whether the environmental munificence, as perceived by the founders, or rather more objective regional economic conditions affect the bootstrapping activities of the nascent firms. This analysis contributes to prior literature that found that the regional context is a salient predictor of bootstrapping behavior (Winborg and Landström, 2001).

Third, while controlling for various environmental conditions and the founders' access to resources in their environment, we analyze the importance that founders' human capital plays in determining bootstrapping behavior. By scrutinizing the effects of the founders' background – such as their education and work experience – on their bootstrapping behavior, we can infer resulting individual cognitions⁴ that determine unique resource management approaches and subsequently shape the trajectory of the emerging firms (Boeker, 1987). Our research contributes to this line of research by fostering our understanding of entrepreneurial agency as a way to address resource constraints and achieve outcomes that might not be attainable using more traditional resource management approaches. Entrepreneurship theorists underline that the central function which entrepreneurs fulfill is in introducing new means/end combinations in the market place (Schumpeter, 1934). Our analysis depicts specific mechanisms of how entrepreneurs achieve ends with means that would not be achievable using conventional approaches. In other words, while the innovative, entrepreneurial resource management approach can be an outcome of entrepreneurial agency, our research also indicates that certain founders apply this approach in the process of developing new offerings.

3. Theoretical framework and hypotheses

The question whether individual characteristics of founders or organizational and environmental factors reasonably explain strategic actions of their ventures has occupied a key position in the study of entrepreneurship (Mitchell et al., 2007). Still, the entrepreneurship literature remains scant in studies simultaneously considering the direct impact of different dimensions of nascent entrepreneurs' and environmental characteristics on a venture's bootstrapping activities while controlling for a relevant array of contingency factors (Edelman and Yli-Renko, 2010; McMullen and Shepherd, 2006).

3.1. Bootstrapping activities and its antecedents

Prior literature referred to bootstrapping as a set of innovative and resourceful managerial activities for accessing and utilizing resources to reduce the overall cost and risk of operations, while avoiding the buildup of dependencies with powerful formal investors (Ebben and Johnson, 2006; Winborg, 2009). Timmons (1999) states that bootstrapping reflects a way of life among certain entrepreneurs to do most with little. Venkataraman (2003) highlights that bootstrapping presents an ideal approach to escape the vicious cycle of resource constraints, “No resources implies no product; no product implies no customers; no customers implies no revenues; no revenues implies no cash for investment; no investment implies no legitimacy or credibility; no legitimacy implies no resources.” Further, Winborg (2009) indicated that bootstrapping practice cannot only be conceived as a matter of last resort due to unfavorable external circumstances, but it also can reflect key characteristics of the individuals at the helm of the firms. Following this intuition, we scrutinize whether bootstrapping activity can be explained by the characteristics of the founders heading the nascent firms next to environmental characteristics. As the firms engage in bootstrapping to structure, bundle, and leverage the entire resource base of their ventures, they aim to avoid market dependencies and introduce new means/end frameworks with the high degrees of freedom afforded an independent, self-financing organization (Vanacker et al., 2011). Thus, our definition conceives bootstrapping as an alternative resource management approach directed at avoiding market-based resource transactions.

⁴ We refer to cognitions as processing of information, applying knowledge, and changing preferences. We suggest that founders' prior experiences shape these cognitive processes and lead to differences in bootstrapping behavior.

3.2. Environmental munificence and the degree of bootstrapping

Nascent ventures are especially affected by the environment in which they operate due to their lack of resources (Baum et al., 2001). Thus, an important characteristic for nascent ventures is the environment's munificence, which reflects the scarcity or abundance of critical resources needed by firms to operate within a specific environment (Castrogiovanni, 1991). As a venture's environment is "everything else" outside the venture, environments are inherently multilevel and multidimensional (Castrogiovanni, 1991). The distinction between a venture's geographical environment (i.e., its physical location) and its industry or market environment (i.e., its business environment) is particularly relevant in this respect. In line with previous bootstrapping studies (e.g., Covin et al., 2000; Ebben and Johnson, 2006; Van Auken, 2005), we primarily focus on a venture's business environment.

Business environments characterized by high munificence enable ventures to access required resources more easily (Baum et al., 2001). Faced with low munificence environments, entrepreneurs can decide not to pursue their startup endeavor, or alternatively, they can devise creative ways to cope with the challenges induced by their venture's environment, such as making use of bootstrapping strategies. Consequently, most studies to date would argue that bootstrapping is a forced firm behavior induced by a low munificence environment.⁵ In particular, the limited access to financial capital through market-based exchanges – ultimately leading to finance constraints – would force entrepreneurs to engage in bootstrapping activities (Ebben, 2009; Ebben and Johnson, 2006; Sapienza et al., 2003; Van Auken, 2005; Venkataraman, 2003). For instance, Van Auken (2005) showed that technology-based ventures, which are expected to be more finance-constrained compared to non-technology-based ventures, rely more heavily on bootstrapping. Ebben and Johnson (2006) further demonstrated that new firms use more bootstrapping strategies than older firms do. New firms are more likely to have limited access to external financing compared to older firms because of liabilities of newness and a lack of a history, which would allow assessing business risks and entrepreneurial capabilities; these findings are consistent with the view that entrepreneurs especially engage in bootstrapping activities when confronted with financial constraints. Further, the entrepreneurship literature suggests that hostile environments characterized by low profit margins, rapidly switching customers, and high competitive pressures (Covin et al., 2000) urge nascent ventures into bootstrapping activities.

While previous studies tended to focus on the relationship between the actual munificence of the environment in which a nascent venture operates and an entrepreneur's use of bootstrapping strategies, we take a cognitive approach and expect that the entrepreneur's perception of the nascent firm's environment drives the use of bootstrapping strategies. Edelman and Yli-Renko (2010) recently showed that an entrepreneur's perception of the environment typically does not fully correlate with the objective reality. However, the relationship between the environment and venture's actions depends on how closely entrepreneurs' perceptions thereof match the objective environmental reality (Castrogiovanni, 1991). Therefore, we expect that entrepreneurs' perceptions of the funding situation might be more important than the objective environmental munificence in deciding on the use of bootstrapping strategies (Castrogiovanni, 1991; Edelman and Yli-Renko, 2010). Entrepreneurs will not remain passive when they perceive hostile environments, but they will engage rather actively in bootstrapping to access and utilize resources. Conversely, this implies that bootstrapping is used less if the environment is perceived to provide sufficient resources. Following these arguments, we posit:

Hypothesis 1. Entrepreneurs who perceive the nascent firm's business environment as scarcer pursue a higher degree of bootstrapping.

3.3. Social capital and the degree of bootstrapping

Linked to environmental munificence, the social capital of nascent entrepreneurs is based on the heterogeneity of their available goodwill created through their personal external ties (Adler and Kwon, 2002). Entrepreneurs have unique ways of exposing themselves to a diverse cross-section of social interactions. Their social capital affects their nascent ventures' bootstrapping activities through two distinct mechanisms. Social capital enables access to various information sources to decide and act upon resource management decisions (Adner and Helfat, 2003; Nahapiet and Ghoshal, 1998) and the goodwill created through entrepreneurs' personal ties allows them to directly mobilize resources for their nascent ventures (Alvarez and Busenitz, 2001; Smith, 2009). Thus, entrepreneurs' structural and relational social embeddedness can be expected to affect bootstrapping activity of their nascent ventures (Jones and Jayawarna, 2010; Smith, 2009).

First, social networks enable access to relevant knowledge about how to acquire the necessary resources on favorable terms so as to conduct entrepreneurial resource management activities (Jones and Jayawarna, 2010; Packalen, 2007; Seghers et al., 2012). Contemporary network literature suggests that access to a larger network increases the probability for entrepreneurs to receive useful information for their resource acquisition activities (De Carolis et al., 2009; Ozgen and Baron, 2007). In consequence, this diversity in accessible information allows entrepreneurs to find alternative means to cope with resource dependencies (Jones and

⁵ Although in munificent environments entrepreneurs might still refrain from taking investors onboard and bootstrap instead to avoid dependencies and a loss of control which would limit the importance of environmental munificence. However, we conjecture that if entrepreneurs see opportunities to obtain financial resources they will selectively acquire these especially in early stages when investors form generally part of the closer network of family and friends who should demand less control rights.

Jayawarna, 2010; Smith, 2009). Hence, entrepreneurs with high levels of social capital are expected to deploy more bootstrapping activities thanks to access to more and relevant information.

In addition to providing access to information, entrepreneurs' social capital also enables them to mobilize necessary and sometimes scarce resources from their network partners. While resources might not be available for nascent ventures through market mechanisms due to high business and agency risk, the goodwill created through their social capital could help entrepreneurs to mobilize necessary resources. Personal contacts might provide resources to support the entrepreneur, rather than based on purely economic motives (Bygrave and Reynolds, 2005), thereby making business risk considerations less relevant. The use of personal ties to mobilize resources can also mitigate agency risks, thanks to higher levels of trust between network partners (McAllister, 1995).

Regarding the relational split of social networks, the literature reasons that entrepreneurs initially rely on their strong tie network (Hanlon and Saunders, 2007). This network type is formed by close personal contacts, such as family members or friends. It is characterized by the high levels of affective trust and resulting goodwill that provides entrepreneurs with predominantly intangible resources, such as emotional support and a forum to freely reflect on venture development (Brush et al., 2001; Chua et al., 2008; Hanlon and Saunders, 2007; McAllister, 1995). Personal contacts or informal investors not only offer intangible resources, but also they often provide initial financial resources to entrepreneurial ventures; they do this not (solely) on economic grounds but, rather, to personally support the entrepreneur (Bygrave and Reynolds, 2005). Hence, entrepreneurs with a good access to strong ties are expected to have easier access to resources through bootstrapping activities.

As entrepreneurs develop their ventures, they tend to deal more with their weak tie network, formed by more distant business contacts (Hanlon and Saunders, 2007), which provides richness in diversity of professional information, expertise, and tangible resources (Brush et al., 2001; Chua et al., 2008; Hanlon and Saunders, 2007; Seghers et al., 2012). The weak tie network thereby serves as inspiration for how best to manage one's resources. Because the weak tie network is comprised of professional business contacts, such as competitors or suppliers, entrepreneurs have the possibility to observe and adapt certain best practices from them for managing their organizational resources (Seghers et al., 2012). Further, the weak tie network rests on cognition-based trust, which is characterized by a calculative and instrumental assessment (McAllister, 1995). The trust created with professional contacts enables entrepreneurs to more easily mobilize resources for their nascent ventures from weak ties, or mobilize resources on more favorable terms compared to what might be possible through market-based transactions (Ebbers and Wijnberg, 2012). Taken together, both the weak and the strong tie networks can be expected to facilitate the acquisition of key resources avoiding market transactions and, thus, enable bootstrapping. In order to shed light on the distinct relationships, we put forth one general hypothesis, followed by two specifications:

Hypothesis 2. Social capital of nascent entrepreneurs is positively related to a higher degree of bootstrapping of their nascent ventures.

Hypothesis 2a. Weak tie networks lead to a higher degree of bootstrapping of their nascent ventures.

Hypothesis 2b. Strong tie networks lead to a higher degree of bootstrapping of their nascent ventures.

3.4. Human capital and the degree of bootstrapping

Entrepreneurs' skill sets for executing certain managerial approaches are heterogeneous based on their human capital endowments (Adner and Helfat, 2003; Davidsson and Honig, 2003). As such, beyond environmental and network factors, an entrepreneur's human capital can be expected to be a driving force of bootstrapping activity at the firm level. The human capital literature has further found that nascent entrepreneurs draw from their human capital to develop subjective ex-ante judgments about the quality of resources, their prices, and future value potential when deployed in their ventures (Arthurs et al., 2009; Mitchell et al., 2002). This judgment is crucial to overcome resource dependencies by envisioning new ways of accessing and using resources (Foss et al., 2008). Thus, human capital based on work experience and education can provide entrepreneurs with different skills that could affect their nascent venture's bootstrapping activities (Dimov, 2010). Subsequently, we differentiate effects resulting from prior entrepreneurial experience, prior general managerial experience, prior academic education, and prior business training.

Prior entrepreneurial experience provides insights regarding the various activities associated with starting a firm, including how to develop contacts with customers and financiers, how to gather and allocate resource, how to organize internal processes and structures, and how to attract and retain employees (Delmar and Shane, 2006). This explicit, or tacit, procedural knowledge can be transferred, at least in part, to different kinds of venturing situations (Shepherd et al., 2000). Because experienced entrepreneurs have already been exposed to the turbulent gestation process of emergent organizations and the impeding effects of the liability of newness, these entrepreneurs are likely to be more aware of the limited ability to compete on the conventional resource market for valuable resources (Dimov, 2010). Therefore, individuals with prior entrepreneurial experience have likely learned about alternative means to bypass the conventional input factor market. Hence, given the domain specific insights, experienced entrepreneurs should be more knowledgeable than other peer founders that lack prior founding experience about ways to address liabilities and constraints when competing for resources (Delmar and Shane, 2006; Hitt et al., 2001; Seghers et al., 2012; Ucbasaran et al., 2003; Vanacker et al., 2011; Winborg, 2009).

In addition to prior entrepreneurial experience, the entrepreneurship literature has highlighted the importance of general managerial skills gained from work experience in established organizations (e.g., Kim et al., 2006). Nascent entrepreneurs with

prior managerial experience can be expected to have a greater repertoire of skills regarding the acquisition of resources, such as negotiation skills, or the integration and deployment of resources, such as monitoring the effectiveness and efficiency of the resource utilization. Moreover, entrepreneurs who have been employed in established organizations frequently found new ventures in industries similar or adjacent to the ones in which they had been working (Westhead and Wright, 1998). Hence, individuals with more managerial experience can be expected to know more about the “rules of the game in the industry” for surviving and succeeding with their nascent venture. Consequently, they can introduce more focused and resourceful approaches regarding the allocation and deployment of resources (Delmar and Shane, 2006; Dimov, 2010). For instance, they might use the trust established with prior business contacts to obtain resource below market conditions. In a similar vein, entrepreneurs with more managerial experience might signal more legitimacy, and they can be expected to have better communication skills for approaching and convincing important stakeholders, which in consequence, facilitates the bootstrapping process (Cooper et al., 1994; Ebbers and Wijnberg, 2012; Packalen, 2007; Winborg, 2009).

Academic education is not only directed at enabling graduates to acquire knowledge in a specific field, but also, it more generally enhances their information processing and learning abilities. The general inclination towards learning can be expected to result in a greater propensity to learn about the various means to acquire and manage resources, which includes bootstrapping, as the individuals aim at establishing their companies. Further, the existing stock of knowledge facilitates the accumulation of new knowledge (Cohen and Levinthal, 1990). Entrepreneurs with more education have a stronger general knowledge base, enabling them to easily acquire more specific knowledge, including knowledge about bootstrapping options. Lee et al. (2011) find that individuals with higher levels of academic education have stronger entrepreneurial intentions, often leading to special entrepreneurial activity. Based on these initial indications, we expect that entrepreneurs with higher levels of academic education will more actively use bootstrapping strategies.

In addition to general academic education, domain-specific business training can affect bootstrapping activities. Whereas general academic education might provide entrepreneurs with abstract cognitive skills, such as complex problem-solving ability, business training specifically targeted at providing insights regarding entrepreneurial endeavors might provide entrepreneurs with specific domain-related knowledge and skills. It has been shown that specific business training enhances entrepreneurs' knowledge about finance options, including bootstrapping techniques, thereby broadening the set of financing and resource acquisition strategies considered by entrepreneurs (Seghers et al., 2012). More broadly, business training should contribute to the entrepreneurs' capabilities and respective confidence for pursuing bootstrapping activities. As these individuals learn about bootstrapping, their likelihood to engage in respective behavior once they start their ventures increases. To this point, research shows that entrepreneurs who underwent specific search and notice learning efforts show more eagerness to utilize their acquired skills in an entrepreneurial context (Zhao et al., 2005). In order to explore the various effects different human capital dimensions have on bootstrapping behavior, we posit one general hypothesis followed by four specifications:

Hypothesis 3. Human capital of nascent entrepreneurs is positively related to a higher degree of bootstrapping.

Hypothesis 3a. More prior entrepreneurial experience of nascent entrepreneurs leads to a higher degree of bootstrapping of their nascent ventures.

Hypothesis 3b. More prior managerial experience of nascent entrepreneurs leads to a higher degree of bootstrapping of their nascent ventures.

Hypothesis 3c. More prior academic education of nascent entrepreneurs leads to a higher degree of bootstrapping of their nascent ventures.

Hypothesis 3d. More prior business training of nascent entrepreneurs leads to a higher degree of bootstrapping of their nascent ventures.

4. Data collection and research method

4.1. Sample

Our study focuses on the nascent phase in the venturing process because it is particularly relevant for elaborating resource dependency related issues (Carter et al., 2003). We follow the prominent definition of nascent entrepreneurs used by the PSED (e.g., Reynolds and Curtin, 2008; Reynolds et al., 2004) and GEM studies (e.g., Reynolds et al., 2000), which define entrepreneurs as individuals (1) who are trying to start a business, (2) who have been actively doing so in the preceding twelve months, (3) who expect to be the owner of the business, (4) whose venture did not achieve monthly cash flows to cover expenses and the owner-manager salaries for more than three months, and (5) whose firm is not controlled by an established firm (Cassar, 2010; Davidsson and Honig, 2003; Delmar and Shane, 2003). In analogy, we define nascent ventures as firms that (1) are in the process of being established in the market place, (2) the founders have undertaken steps to establish the specific venture in the preceding six months (here our definition is somewhat stricter than the PSED definition, which requires that activities had to be undertaken in the preceding twelve months), (3) are owner directed, (4) the ventures are not operating profitably yet, and (5) the ventures are not controlled by an established firm. We believe that resource constraints are especially challenging for these nascent ventures and that bootstrapping activity should be of critical importance at determining future development.

It is well documented that obtaining contacts to emergent organizations is particularly challenging given that they can hardly be found in existing databases (Reynolds and Curtin, 2008). In order to overcome this challenge, we surveyed entrepreneurs of nascent ventures participating in four major business plan competitions in Germany and one in Austria. Unlike their counterparts in the United States, these business plan competitions are generally not linked to specific institutions like universities or corporations. They are regional and government sponsored competitions used to foster entrepreneurial activities. Business plan competitions in Germany and Austria typically attract growth-oriented ventures, as the organizations provide a range of supporting activities next to the business plan contests, including seminars, individual coaching, and networking activities. Therefore, traditional resource providers, such as banks, often motivate ventures to participate because this helps to prepare stronger business plans. While the winners of the competition typically receive a few thousand Euros at the end of the business plan competitions, which subsequently might distort the need for bootstrapping, the actual chances of winning are very small. In addition, the respective prize money was awarded after our study period; therefore, this bias should be limited.

Nevertheless, our sample is not representative of the general population of nascent ventures. The participation in these prominent business plan competitions likely causes a self-selection towards more ambitious and growth-oriented entrepreneurs. The average age of the participants in the business plan contest was about 38 years and 71% of the entrepreneurs were male; 60% have completed a university master degree. Participants had 8.6 years of work experience, worked 4.1 years in startups, and on average, had founded one prior venture. Despite these similarities, we noted considerable variation in both the degree to which entrepreneurs in our sample engaged in bootstrapping activities (the main dependent variable) and their social and human capital. Because this paper focuses on innovative and resourceful resource management activities of nascent ventures, we believe that the sample is especially powerful for our research because the need to obtain resources in addition to traditional market interactions is of utmost importance for these more growth-oriented ventures. However, in order to control for any effects the involvement of the nascent ventures with business plan organizations might have on bootstrapping activities and thereby address concerns of representativeness, we controlled for the intensity of interactions with the business plan competitions.

In order to obtain information about the bootstrapping activities of the nascent ventures, we surveyed a member of the founding team following substantial prior literature, which proposed the validity of using a founding entrepreneur as the key respondent for research in emergent organizations (e.g., Brinckmann and Hoegl, 2011; Chandler and Lyon, 2001; Delmar and Shane, 2003).

Prior to the survey launch, we conducted pre-tests with ten entrepreneurs and gathered feedback from the managers of the business plan competition organizations that distributed our survey. In order to ensure data reliability, we used an online questionnaire-based approach to gather data from the respondents. Emails and reminders were sent to participants of the business plan competitions with the link to the website. 768 people followed these links. We obtained 298 fully usable questionnaires. Completing the questionnaires took between 30 and 40 min. A possible non-response bias was analyzed by comparing early versus late respondent data (Armstrong and Overton, 1977). T-tests that compared the variable means of central measures, such as the degree of bootstrapping, and human and social capital measures indicated only marginal differences at the 0.10-level of significance between early and late respondents. In order to address a potential common source bias, we used the following procedural and statistical measures suggested by Podsakoff et al. (2003). First, to improve the scales, we conducted a series of pre-tests and tracked the respondents as they thought aloud while filling out the survey to decrease the chance of ambiguous, suggestive, or difficult questions. Second, with regard to statistical analysis, we utilized Harman's single-factor test for all constructs in our analyses. The factor analysis yielded thirteen factors with Eigenvalues in excess of 1.0. These thirteen factors accounted for 64% of the total variance. Because several factors were identified, and because the first factor did not account for a large percentage of the variance (14%), a substantial amount of common source variance does not appear to be present.

4.2. Dependent variable

4.2.1. Degree of bootstrapping

We measured the nascent firms' bootstrapping activity using the scale provided by Freear et al. (1995) and further developed by Winborg and Landström (2001). We changed their 5-point Likert scale to a 7-point Likert scale, and we adjusted items that were country specific (Appendix A). The scale uses a reflective measurement approach, following other prominent literature on bootstrapping (e.g., Ebben and Johnson, 2006; Winborg, 2009; Winborg and Landström, 2001) and strategic orientations (e.g., Covin and Slevin, 1989; Lumpkin and Dess, 1996). We see financial bootstrapping as an activity resulting from a cognitive disposition. Hence, in the strict sense, it remains a reflective concept, i.e., the bootstrapping behaviors reflect/are caused by a cognitive bootstrapping mindset, which previously was shaped by the experiences and socialization of the individuals. Thus, while the reflective measurement methodology follows previous work on bootstrapping, our theoretical underpinning, which fits the measurement approach, is novel. The final scale achieved satisfactory reliability with a Cronbach's alpha score of 0.83 (Nunnally, 1978). The resulting score was calculated by summing up all of the individual bootstrapping indicators.

4.3. Independent variables

4.3.1. Environmental munificence

The environmental munificence faced by nascent ventures is measured subjectively as the entrepreneur's perception of such munificence (Castrogiovanni, 1991). We measured the perceived munificence of nascent ventures' business environment in two ways. First, we measured the entrepreneurs' level of satisfaction with their *access to external financial capital* on a 7-point scale using the opposing statements "insufficient and a great impediment to our development" and "fully satisfactory for the firm's

development" (Wiklund and Shepherd, 2005). Second, the *perceived environmental hostility* construct was measured using a 6-item, 7-point scale originally used by Covin et al. (2000). The items measure perceptions relating to the following statements: (1) "The failure rate of firms in my industry is high," (2) "My industry is very risky such that one bad decision could easily threaten the viability of my business unit," (3) "Competitive intensity is high in my industry," (4) "Customer loyalty is low in my industry," (5) "Severe price wars are characteristic of my industry," and (6) "Low profit margins are characteristic of my industry." The scale achieved acceptable internal reliability with a Cronbach's alpha score of 0.76 (Nunnally, 1978).

4.3.2. Social capital

To measure the social capital of entrepreneurs we used an approach that was previously applied by De Carolis et al. (2009). Measures were constructed to assess the extent to which the entrepreneurs were structurally and relationally embedded in personal networks. Therefore, entrepreneurs were asked to indicate if they know people in different groups of contacts who are entrepreneurs. In addition, they were also asked which groups support them. The group options for both questions were parents, close family members, friends, mentors, relatives, neighbors, industry networks, professional organizations, academic institutions, and others. Based on the strength of the relationships with respect to emotional factors such as trust, the first five options were considered to constitute *strong ties* and the others *weak ties*, following Nahapiet and Ghoshal (1998).

4.3.3. Human capital

Regarding human capital measures, following prior theory, we focus on the duration of the socialization in a specific work context rather than expertise gained or displayed in a specific work area. Hence, *managerial experience* was measured by asking the entrepreneurs to enter the number of years they had spent working in incumbent firms. We introduced three experience groups (0 years, 1–3 years, and more than 3 years).

Entrepreneurial experience was measured similar to managerial experience, by asking the entrepreneurs to enter the number of years they had spent working for start-up firms (Davidsson and Honig, 2003). The *academic education* level was measured using six options according to the German education system, ranging from 1 for high school to 6 for doctoral degree (De Carolis et al., 2009). The *business training* measure captured how much specific education/training the entrepreneurs obtained prior to starting their ventures. We asked them if they obtained training in areas – such as legal, marketing, sales, strategy, etc. – that could be related to their venture (Davidsson and Honig, 2003). We summed the selected options and introduced three groups of business training scores (0 training, 1–2 trainings, more than 2 trainings).

4.4. Control variables

We control for the different organizational contingency factors that prior bootstrapping literature has identified. In addition, we also controlled for demographic factors of the entrepreneur, such as gender and age.

4.4.1. Organizational contingencies

We captured the *team size* (number of persons working in the venture) because it is often used as a proxy for organizational size, reflecting the general level of resource availability. Additional variables were introduced to capture the business model because *service-based ventures* might require lower fixed resource endowments than, for example, manufacturing firms and, thus, might be less exposed to resource scarcities. *Technology-based ventures* might be more inclined towards bootstrapping activity. Due to the high cost and risk associated with technology development and long market lead times, acquiring financial capital is commonly more difficult for these kinds of ventures (Van Aukun, 2005). Therefore, we asked the entrepreneurs to state whether they consider their venture technology-based. In the same vein, we control for the *degree of innovation* of the venture, with options ranging from not innovative or marginally innovative to radical or extremely innovative (Dencker et al., 2008; Kirzner, 1997). Prior bootstrapping literature assumes that lack of financial capital is the major driver behind bootstrapping activity; therefore, we capture how much *initial capital* has been available to the nascent ventures (Ebben, 2009; Winborg and Landström, 2001). This 5-point scale ranges from "it is not sufficient to formally incorporate the venture" to "it is sufficient to finance the venture independently for more than six months" (Wiklund and Shepherd, 2005). Further, prior literature has explained that the overall magnitude of resource dependencies and according difficulties in acquiring required resources can be linked to the liabilities of newness, which decreases with growing *venture phase* (Ebben and Johnson, 2006). Rather than relying on an organizational age measure, we used an approach to capture the ventures' maturity based on its operational status in product and customer base development. The product development phase scale was taken from the prior research of Delmar and Shane (2003). We adapted a similar scale for capturing the development in the acquisition of the customer base that ranged from 1 "no activities for identifying or acquiring customers have started yet" to 6 "a solid customer base has been established already." The final scale was determined by adding both scores. Finally, we also controlled for the effect that the participation at the business plan competition has on the bootstrapping behavior by adding a measure that captures how many times the respective founder participated in an event as part of the overall business plan competition.

5. Findings

Descriptive and correlation statistics can be found in Table 1. Entrepreneurs in our sample are, on average, 38 years old and 71% are male. The average number of persons working in the venture (including the entrepreneurs) amounts to three. The vast

Table 1
Descriptive statistics and correlations^a.

	Mean	S.D.	Min	Max	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.
<i>Control variables</i>																						
1. Gender male	0.71	0.46	0.00	1.00	1.00																	
2. Age of entrepreneur	37.67	10.51	20.00	78.00	0.00	1.00																
3. Business plan competition	2.15	1.30	1.00	5.00	-0.20	0.09	1.00															
4. Team size	3.13	2.79	1.00	30.00	0.17	-0.03	0.81	1.00														
5. Service business model	0.70	0.46	0.00	1.00	-0.07	0.00	-0.01	-0.13	1.00													
6. Technology involvement	0.47	0.50	0.00	1.00	0.34	-0.08	-0.07	0.19	-0.14	1.00												
7. Innovativeness	1.98	0.59	1.00	3.00	0.18	0.16	-0.01	0.22	-0.16	0.30	1.00											
8. Internal financial capital duration	3.33	1.39	1.00	5.00	0.07	0.04	-0.13	-0.20	0.27	-0.04	-0.10	1.00										
9. Venture phase	7.58	2.49	2.00	11.00	0.00	0.14	-0.14	-0.05	0.08	-0.05	0.04	0.31	1.00									
<i>Independent variables</i>																						
10. Environmental hostility	3.72	1.17	1.00	6.80	0.06	-0.07	0.01	0.07	-0.11	0.11	-0.08	-0.01	-0.10	1.00								
11. External financial capital access	3.56	1.75	1.00	7.00	-0.08	-0.10	0.02	-0.12	0.10	-0.09	-0.15	0.31	0.10	-0.10	1.00							
12. Weak ties	2.57	1.67	0.00	8.00	0.17	0.09	0.00	0.36	-0.08	0.06	0.21	0.00	0.01	-0.03	-0.04	1.00						
13. Strong ties	4.01	1.98	0.00	10.00	0.03	-0.13	0.03	0.02	-0.04	-0.10	0.01	0.08	0.05	-0.01	0.03	0.34	1.00					
14. Academic education level	4.55	1.03	1.00	6.00	-0.01	0.00	-0.01	-0.07	0.12	0.06	-0.01	0.07	-0.03	0.04	0.12	0.04	0.02	1.00				
15. Business training level	1.18	0.79	0.00	2.00	-0.07	0.02	0.20	-0.03	-0.04	-0.09	0.07	-0.03	-0.01	-0.06	0.11	0.22	0.17	-0.07	1.00			
16. Entrepreneurial experience	1.12	0.84	0.00	2.00	0.08	0.33	0.00	0.05	0.08	-0.08	0.14	0.10	0.24	-0.07	-0.09	0.13	-0.01	-0.04	-0.05	1.00		
17. Managerial experience	1.50	0.74	0.00	2.00	-0.07	0.41	0.11	-0.09	0.11	-0.13	-0.11	0.08	0.03	-0.05	0.06	-0.04	-0.08	-0.03	0.06	0.12	1.00	
18. Degree of bootstrapping	54.77	18.23	18.00	114.00	0.08	0.02	-0.01	-0.03	-0.05	-0.05	0.03	-0.05	-0.10	0.19	-0.12	0.22	0.06	0.10	0.15	0.04	0.11	1.00

N = 298.

^a Pearson correlation of 0.15 or higher is significant at the 0.01 level; Pearson correlation of 0.12 or higher is significant at the 0.05 level (2-tailed).

majority of the ventures (70%) are service-based and almost half (47%) have a technology focus; the average entrepreneur considers the venture to be marginally innovative. The initial financial capital duration variable has an average value of 3.33, varying between 1 and 5, and the venture phase variable has an average value of 7.58, varying between 2 and 11.

The average entrepreneur in the sample has an education level of 4.5 (on a 1 to 6 scale), which responds to a graduate degree; received 1 or 2 business training courses; has between 1 and 3 years of entrepreneurial experience and slightly higher managerial experience. Correlations between dependent variables, independent variables, and control variables are weak, with the highest correlation being 0.41 (correlation between the age of the entrepreneur and his/her managerial experience).

We used a hierarchical regression analysis to stepwise elucidate how the different independent variables and contingency factors contribute to the explanation of ventures' degrees of bootstrapping activity. Model 1 includes only control variables; we then added the environmental munificence variables as well as the human and social capital variables (Model 2). The models signal limited multicollinearity concerns, as the maximum VIF is 1.45 and the condition index is below 30. The VIFs are very low which indicates limited collinearity among the independent variables. The condition index is at the threshold. However, as we further excluded all non-significant control variables the condition index drops to 22.⁶ This gives us confidence that the higher condition index is rather driven by the number of independent variables than by high collinearity among the independent variables. Results of the regressions are shown in Table 2.

Adding the independent variables significantly increases the power of the regression models. The model including the independent variables (Model 2) is significantly better able to explain bootstrapping strategies compared to the model including solely control variables (Model 1); the R^2 increases from 0.03 in Model 1 to 0.17 in Model 2. This finding suggests that entrepreneurial and environmental characteristics drive bootstrapping strategies. We focus on the full model (Model 2) to discuss our findings related to the hypotheses. Because of our focus on assessing the relative importance of the different independent variables, we report standardized coefficients.

Regarding the munificence of a venture's business environment, our empirical findings suggest that perceived environmental hostility ($b = 0.19$, $p < 0.001$) or lack of access to external financial capital ($b = -0.12$, $p < 0.05$) increases the degree of bootstrapping as expected. Hence, we find support for Hypothesis 1, which states that entrepreneurs who perceive their nascent ventures' business environment as scarcer pursue a higher degree of bootstrapping.

Second, as proposed, we find mixed evidence that entrepreneurs' social capital is an antecedent of bootstrapping activity (Hypothesis 2). The size of the weak tie network, but not the strong tie network, has a positive association with the degree of bootstrapping ($b = 0.19$, $p < 0.01$). This provides support to Hypothesis 2a, but not for Hypothesis 2b. Taken together, we cannot confirm a broad link between social capital and bootstrapping. Our results suggest that entrepreneurs that are able to draw upon a weak tie network engage in more bootstrapping activities in their nascent ventures, while entrepreneurs that mainly draw upon a strong tie network do not.

Lastly, with regard to the human capital variables, Model 3 confirms that prior managerial experience has a positive significant association with the degree of bootstrapping ($b = 0.15$; $p < 0.05$), but we did not find the same evidence for entrepreneurial experience. Hence, Hypothesis 3a is rejected, and Hypothesis 3b is supported. Furthermore, we find that both the business training that the entrepreneurs underwent as preparation for running their venture and their overall academic education level are positively related to the use of bootstrapping ($b = 0.14$, $p < 0.05$ and $b = 0.12$, $p < 0.05$ respectively). This supports Hypotheses 3c and 3d. In general, we find that many dimensions of human capital affect bootstrapping, but not all. In total, support for the general hypothesis linking human capital and bootstrapping is mixed (Hypothesis 3), but a more nuanced understanding is needed. More specifically, entrepreneurs with higher levels of academic education or with more business training, or entrepreneurs with more managerial experience use more bootstrapping in their nascent firms. Interestingly, no such relationship is found for entrepreneurial experience.

Finally, few control variables affect bootstrapping activity. In contrast to expectations, technology development is weakly negatively associated with bootstrapping activity in Model 2 ($p < 0.10$) and venture phase is weakly negatively associated with bootstrapping activity in Model 1 ($p < 0.10$), as expected. Male entrepreneurs more actively use bootstrapping strategies in Model 1 only ($p < 0.10$). However, contrary to previous literature, we find that organizational factors influencing the financial capital demand of a nascent venture do not significantly evoke bootstrapping activity (e.g., Ebben, 2009). Overall, we find that the contingency variables account only for less than one-tenth of the explained adjusted variance for the degree of bootstrapping.

6. Post-hoc analyses

6.1. Investigating antecedents of bootstrapping sub-dimensions

The bootstrapping literature acknowledges that not all bootstrapping activities are fully comparable and that antecedents might have a different effect on different types of bootstrapping activities. Early research distinguishes different types of bootstrapping activities, such as owner-related finance methods, minimizing investments, customer-related bootstrapping

⁶ We also checked more comprehensive models, including further control variables (employment status dummies, a high growth ambition dummy, exit-seeking dummy, and dummies for the different locations of the business plan contests). However, while the condition index with a model of 19 controls increased to 46, the key relationships reported subsequently did not change (direction and level of significance). Given that all of these additional variables were non-significant, we opted for a more conservative modeling that observed the threshold of 30 regarding the condition index.

Table 2
Antecedents of bootstrapping activity: hierarchical regression analysis.

	Model 1 (controls)	Model 2 (+ environmental)	Model 3 (+ human capital, social capital)	Model 4 (factor: customer related)	Model 5 (factor: joint resource utilization)	Model 6 (factor: temporary resource utilization)	Model 7 (factor: internal self financing)
	Std. B	Std. B	Std. B	Std. B	Std. B	Std. B	Std. B
<i>Controls</i>							
Gender male	0.12 [†]	0.11 [†]	0.08	−0.06	0.14 [*]	0.07	0.14 [*]
Age of entrepreneur	0.02	0.02	−0.08	−0.04	−0.14 [*]	−0.04	0.00
Business plan competition participation	0.00	0.00	−0.04	−0.03	−0.06	0.02	−0.04
Team size	−0.06	−0.06	−0.04	−0.1 [†]	0.15 [*]	−0.05	−0.08
Service business model	−0.04	−0.02	−0.04	−0.08	0.06	0.01	−0.06
Technology involvement	−0.10	−0.12 [†]	−0.11 [†]	−0.06	−0.05	−0.06	−0.14 [*]
Innovativeness	0.04	0.06	0.03	0.07	−0.02	0.04	−0.03
Internal financial capital duration	−0.03	−0.01	−0.01	−0.01	0.06	−0.10	−0.04
Venture phase	−0.1 [†]	−0.09	−0.08	−0.11 [†]	−0.10	−0.13 [*]	0.12 [†]
<i>Independents</i>							
Environmental hostility		0.18 ^{**}	0.19 ^{***}	0.16 ^{**}	0.09 [†]	0.15 [*]	0.12 [*]
External financial capital access		−0.08	−0.12 [*]	−0.09	−0.12 [*]	0.05	−0.11 [†]
Strong ties			−0.04	−0.02	−0.14 [*]	−0.03	0.08
Weak ties			0.19 ^{**}	0.13 [*]	0.21 ^{***}	0.11 [†]	0.08
Academic education level			0.12 [*]	0.09	0.09	0.02	0.12 [*]
Business training level			0.15 [*]	0.13 [*]	0.13 [*]	0.06	0.06
Entrepreneurial experience			0.05	0.08	0.01	0.00	−0.01
Managerial experience			0.15 [*]	0.18 ^{**}	0.11 [†]	0.07	0.01
R ²	0.03	0.07	0.17	0.14	0.16	0.08	0.11
Adjusted R ²	0.00	0.04	0.12	0.09	0.11	0.03	0.06
F-statistic	1.07	2.04	3.27	2.73	3.16	1.46	2.13
Significance	0.39	0.03	0.00	0.00	0.00	0.11	0.01

Std. B = standardized beta.

N = 298.

[†] p < 0.1.

* p < 0.05.

** p < 0.01.

*** p < 0.001.

methods, or joint resource utilization techniques (Ebben and Johnson, 2006; Vanacker et al., 2011; Winborg and Landström, 2001). Therefore, we re-estimated our models on individual factors, rather than on total bootstrapping activity.

While previous bootstrapping studies typically focused on new ventures (Vanacker et al., 2011; Winborg and Landström, 2001) or incumbent small firms (Ebben and Johnson, 2006), the context of our study is nascent ventures. Therefore, other factors might emerge in our context. We ran exploratory principal component factor analyses in which four factors emerged, with acceptable Eigenvalues and Cronbach alphas explaining 55% of the variance across the set of bootstrapping methods (see Appendix A). The first factor, *customer related bootstrapping methods*, is comprised of seven items (Cronbach alpha of 0.83). It is the same factor as in Winborg and Landström (2001) and Ebben and Johnson (2006), but additionally includes an item on supplier conditions. A second factor, which is not found in previous literature, is labeled *temporary resource utilization* and includes two items (Cronbach alpha of 0.69), borrowing equipment from others and leasing equipment instead of buying. Third, the *internal self-financing* factor is composed of five items (Cronbach alpha of 0.64), including items from factors previously identified in the literature as “owner-related financing” and “delaying payments” (Ebben and Johnson, 2006; Winborg and Landström, 2001). Finally, the fourth factor *joint resource utilization* includes four items (Cronbach alpha of 0.77) and is broadly consistent with Winborg and Landström (2001) and Ebben and Johnson (2006). The factor analysis suggests that some bootstrapping factors measured in a nascent venture setting are broadly consistent with those measured in a start-up setting or in older ventures. Others, such as temporary resource utilization and internal self-financing, are specific to nascent ventures.

Models 3 to 6 show how the independent and control variables relate to each factor separately. The models have an R² ranging from 0.08 (factor *temporary resource utilization*) to 0.16 (factor *joint resource utilization*). Suest-tests are used to assess whether the coefficients of the same variable are significantly different across models; only significant differences are highlighted hereafter. Consistent with H1, we find that entrepreneurs operating in a perceived hostile business environment use each type of bootstrapping strategy significantly more: customer related bootstrapping techniques (b = 0.16, p < 0.01), temporary resource utilization (b = 0.15, p < 0.05), internal self-financing (b = 0.12, p < 0.05), and joint resource utilization strategies (b = 0.09, p < 0.1; coefficient significantly different from model Temporary resource utilization). Entrepreneurs with more access to external financial capital use less internal self-financing (b = −0.11, p < 0.1) and less joint resource utilization strategies (b = −0.12, p < 0.05), but they are equally active in using customer related bootstrapping methods and temporary resources. Hence, bootstrapping strategies that draw upon the resources of customers, or that focus on sharing resources with others, are avoided if entrepreneurs have more access to financial capital.

Hypothesis 2 predicted a positive relationship between social capital and the use of bootstrapping strategies. Contrary to expectations, strong ties only have a significantly negative effect on joint resource utilization ($b = -0.14, p < 0.05$). Weak ties, on the other hand, positively correlate with the use of customer related bootstrapping strategies ($b = 0.13, p < 0.05$; coefficient significantly different from model Internal self-financing), temporary resource utilization ($b = 0.11, p < 0.10$), and joint resource utilization ($b = 0.21, p < 0.01$; coefficient significantly different from model Internal self-financing). Weak ties, which are mainly ties with the business community, hence, are positively related with bootstrapping activities that draw upon business partners, but not with internal self-financing. Strong ties have little relationship with the use of bootstrapping strategies.

Finally, greater human capital is expected to positively correlate with the use of bootstrapping strategies (**Hypothesis 3**). Managerial experience has a positive association with the use of customer-related bootstrapping methods ($b = 0.18, p < 0.01$; coefficient significantly different from model Internal self-financing) and joint resource utilization strategies ($b = 0.11, p < 0.10$). Entrepreneurs with managerial experience are more aware of business-related bootstrapping strategies and, consequently, use them more extensively. Having received formal business training is positively associated with the use of customer-related bootstrapping methods ($b = 0.13, p < 0.05$) and joint resource utilization ($b = 0.13, p < 0.05$), both of which are typically stressed in business education. Interestingly, an entrepreneur's academic education level is positively associated with internal self-financing ($b = 0.12, p < 0.05$) but not with other bootstrapping strategies.

Interestingly, more control variables are significant here than were in the aggregated models. Compared to female entrepreneurs, male entrepreneurs use significantly more joint resource utilization strategies and internal self-financing, but not customer related or temporary resource utilization activities. Older entrepreneurs use significantly less joint utilization strategies. Internal self-financing is less prevalent when larger teams are involved and in technology-based ventures. Finally, more developed ventures use fewer customer related bootstrapping methods and less temporary resource utilization but more internal self-financing.

While largely confirming our results pertaining to the use of total bootstrapping activity, these additional analyses allow more fine-grained insights into how antecedents shape the use of particular bootstrapping strategies.

6.2. Robustness tests

In order to test the robustness of our findings, robustness checks were performed relating to measuring a venture's environmental munificence, adding more control variables, and exploring interaction effects. A first robustness check relates to the conceptualization of the environmental munificence variable. First, because a venture's environment is multidimensional ([Castrogiovanni, 1991](#)), we explored the impact of its geographic environment. Dummies for each of the five cities that formed our sample frame – Munich, Berlin, Cologne, and Dortmund in Germany and Vienna/Austria – were included in the regression models. However, none of the dummies was significant. This is especially striking given the substantial regional differences among the five cities. For instance, Munich is one of the most prosperous regions in Germany while Berlin is at the opposite end of the spectrum ([Audretsch et al., 2010](#)). The lack of regional impact could be attributed to the fact that many of the public funding programs are national or devote special attention to structurally disadvantaged regions. Hence, the non-significance of the regional effects could suggest that additional funding programs for disadvantaged regions do offset regional economic differences, in part. Alternatively, the non-significance could be driven by the fact that all ventures in our sample were established in a major city, thereby omitting ventures established in rural areas and underestimating the variation in geographical munificence ([Harrison et al., 2004](#); [Winborg and Landström, 2001](#)).

Second, in order to more fully capture a venture's objective environmental munificence, we added variables that directly capture a region's economic development and its entrepreneur-friendliness, including the number of new businesses established in the region, patents, financing for early stage ventures, R&D expenditures, business insolvencies, and regional GDP per capita. These objective variables capture a region's business munificence. Interestingly, the correlation between the five objective measures of environmental munificence and the entrepreneur's perception thereof is low (varying between -0.02 and 0.21), in line with [Edelman and Yli-Renko \(2010\)](#). Adding the objective environmental munificence variables to the multivariable models did not improve their fit and none of the variables' coefficients was statistically significant at the 0.10-level. This evidence strongly suggests that entrepreneurs' perceptions of their nascent ventures' environmental business munificence are important in shaping their bootstrapping behavior rather than their objective environmental munificence or their geographical munificence.

Further, we added other control variables, such as the entrepreneurs' willingness to take risk, their growth and exit ambitions, and their employment situation (differentiating between student, unemployed, employed, and independent). However, none of these variables was significant and the results of the multivariate models were not meaningfully affected by their inclusion. In order to avoid an over-specification of the models, we left these variables out and focused only on the most important control variables.

We further examined alternative models in which the duration of venture funding and the availability of funding were separately included in the modeling due to potential concerns that these measures could bias findings because of their relatedness. The results remained the same with regard to direction of the identified effects and the level of significance. Next, some of the nascent ventures in our sample already had an established customer base, which might affect their bootstrapping strategies. Therefore, we re-ran the regression models excluding firms without an established customer base, which reduced the sample size to 250. Overall, our main findings remain robust (same direction and level of significance) and do not indicate a bias.

A final robustness check relates to the exploration of potential interaction effects. In addition to the direct effects, potential moderation effects might exist. The different antecedents might complement and substitute each other. For instance, experience or education might be an effective substitute when lacking access to financial resources, and especially in these circumstances, it might lead to bootstrapping behavior. Following this intuition, we ran various moderation analyses between all predictor

variables (specifically testing HC*SC, HC*ENV, SC*ENV). However, based on the data, no moderation effects were identified at the 0.10-level of significance.

7. Discussion

This article intended to resolve a central ambiguity in the entrepreneurial bootstrapping literature concerning whether the bootstrapping phenomenon in nascent ventures could present an individualistic strategically driven resource management approach of entrepreneurs (e.g., [Ebben, 2009](#)). Therefore, we jointly scrutinized antecedents of entrepreneurs vis-à-vis environmental contingencies that arguably directly dictate the discretion for entrepreneurial actions ([Adner and Helfat, 2003](#); [Edelman and Yli-Renko, 2010](#)). We analyzed how an individual's background shapes the bootstrapping behavior at the firm level. Both levels are closely related as individual factors determine the firm related bootstrapping activities. As such, we believe that the entrepreneurship context offers a unique opportunity to depict the origins of firm level strategies. More specifically, we show entrepreneurs' backgrounds and founding contexts affect their ventures' financing ([Ebberts and Wijnberg, 2012](#)). We believe that this research design adds to the prominent literature on micro-foundations of strategy (e.g., [Foss et al., 2008](#)) and further positions financial bootstrapping behavior as a conscious or unconscious strategic choice of the founders.

Our study revealed various novel insights. First, our results show that the use of bootstrapping strategies in nascent ventures is an individualistic choice of entrepreneurs beyond what a venture's environment dictates. This view challenges prior entrepreneurship literature, which has often implicitly framed bootstrapping as a reactionary activity of entrepreneurs mainly driven by a lack of market-based alternatives (e.g., [Ebben, 2009](#); [Sapienza et al., 2003](#)). Our findings support recent indications from the resource dependency literature, which suggest that entrepreneurs proactively seek alternative means for enacting their environment in order to mitigate resource dependencies (e.g., [Katila et al., 2008](#)). As such, our analysis supplements the recently developing literature stream that views entrepreneurs as agents who seek to overcome the bounded capacities of their ventures and avoid resource dependencies ([Edelman and Yli-Renko, 2010](#); [Haynie et al., 2010](#)).

Next, we detail the new insights provided by our study regarding the distinct antecedents of bootstrapping activity before reaching at our final conclusion and the resulting theoretical and managerial implications. With regard to the contingency theory based explanation of bootstrapping activity, our study supports previous research that stressed consideration of factors such as environmental hostility when explaining entrepreneurial actions ([Ebben and Johnson, 2006](#); [Nicholls-Nixon et al., 2000](#)). As expected, ventures initiated in perceived hostile business environments or with insufficient access to external financial capital have a higher propensity of engaging in bootstrapping activities. This suggests that accessing resources through bootstrapping strategies supplements market-based resource acquisition strategies in nascent ventures. This finding aligns with recent literature stressing resource-based uncertainty stemming from financial constraints as a central trigger to entrepreneurial actions (e.g., [Ebben, 2009](#); [Hoegl et al., 2008](#)). Nonetheless, this finding raises questions about an optimal level of bootstrapping. Given that financial bootstrapping with credit cards, trade credits, and personal guarantees is rather expensive and causes high resource dependencies, too much bootstrapping might not be beneficial. Further, relying on shared resources might imply working with resources that are not optimally suited for the venture. An inverse U-shaped performance effect might result because benefits are increasingly counteracted by augmenting capital and agency costs of bootstrapping.

Beyond perceived environmental factors, characteristics associated with the entrepreneur can predict bootstrapping activity. We discover interesting findings regarding the social capital of nascent entrepreneurs. Nascent entrepreneurs draw especially on their weak tie network for bootstrapping activities, but not on their strong tie network. Hence, our result supplements and nuances previous research stating that nascent entrepreneurs with more contacts are more likely to launch and successfully establish new ventures ([De Carolis et al., 2009](#)).

The finding that bootstrapping entrepreneurs prefer not to draw on resources from their close circle might be explained by two complementary mechanisms. First, as interpersonal relationships in strong tie networks do not originate from business related matters, entrepreneurs might refrain from leveraging contacts from their strong tie network. The use of resources obtained from strong ties could create a dilemma; either entrepreneurs refrain from investing in risky assets in order to preserve these resources and thereby might not be able to seize promising opportunities, or they invest in risky activities that might carry a risk of personal conflicts at some point if the resources are lost ([Hanlon and Saunders, 2007](#)). Considering this conundrum, our findings suggest that bootstrapping entrepreneurs prefer to protect the affect-based trust of their close ties by not exposing their relationships to this conflict potential. Instead, they appear to favor aiming for resources from their weak tie network.

In addition, the observed absence of bootstrapping from strong ties might be due to a simple lack of relevant resources in their immediate environment. For example, entrepreneurs' strong ties might lack relevant target customers, supplier connections, or adequate monetary means to support a risky venture. In contrast, weak tie networks are broader and more extensive in scope and, hence, can be more likely to link to the relevant business community and enable access to a greater resource base. Thus, the probability is higher that these weak ties can provide valuable resources more often. In consequence, as evidenced by our findings, we are more likely to observe that the nascent entrepreneurs acquire resources from weak ties than from strong ties. Clearly, a more detailed examination of the resource acquisition strategies of nascent entrepreneurs regarding strong and weak ties is needed in future research. However, our finding that weak and strong ties have different effects on bootstrapping is important in itself, given the vibrant debate on the value of weak and strong tie networks for nascent entrepreneurs (e.g., [Davidsson and Honig, 2003](#); [Hoang and Antoncic, 2003](#)). Our findings support further evidence for the relevance of

considering the relational dimension of nascent entrepreneurs' social capital for explaining their managerial actions ([Chua et al., 2008](#); [McAllister, 1995](#)).

Finally, we find that nascent entrepreneurs with greater levels of human capital in different areas employ more bootstrapping activities. Entrepreneurs with managerial experience and those who have pursued higher levels of academic education or specific business training engage in bootstrapping to a greater extent. This shows that both specific direct experiences and education can affect bootstrapping. However, surprisingly, we do not discover any impact of prior entrepreneurial experience. It appears that with regard to preferences and abilities to engage in bootstrapping or engage in alternative resource acquisition approaches, entrepreneurial experience does not have a strong impact. We conjecture that although bootstrapping abilities should increase with experience, other resource acquisition abilities should also do so. Moreover, the preference structure of experienced entrepreneurs might not be favoring bootstrapping. However, to draw more specific conclusions, future research needs to isolate the effects of these different dimensions.

To conclude, the central finding of our study is that nascent ventures not only engage more in bootstrapping activities in hostile environments, but also when the entrepreneurs have higher levels of social and human capital. This aligns with recent insights from the entrepreneurship literature implying that bootstrapping is not a matter of last resort ([Winborg, 2009](#)). Nascent ventures' bootstrapping activities are largely a result of the entrepreneurs' individualistic backgrounds. Our conclusion advocates that entrepreneurs have decisive influence on the destiny of their nascent ventures and should be placed center stage in the strategy-formulation process in which bootstrapping appears to play a central role ([Foss et al., 2008](#); [Holcomb et al., 2009](#)).

7.1. Implications for academia

Our findings are of direct relevance for the future positioning and development of the bootstrapping construct in the entrepreneurship literature. We reveal that bootstrapping is an individualistic, socially complex phenomenon, and our study supports the view that bootstrapping can be conceived as an idiosyncratic approach for managing a venture's resources ([Alvarez and Busenitz, 2001](#)). Hence, our study indicates that the inputs and outputs of the bootstrapping approach are unique to the nascent entrepreneurs, and thus, bootstrapping can present a source of competitive advantage during organizational emergence ([Sirmon and Hitt, 2003](#); [Vanacker et al., 2011](#)). Accordingly, more research attention should be drawn towards fostering our understanding about which self-contained actions nascent entrepreneurs should pursue to best support their ventures' development ([Brinckmann et al., 2011](#)).

Further, our findings point to the importance of cognitive effects when considering different resource acquisition approaches. We believe that future research could benefit by considering more specifically perceptions, preference structures, and cognitive processes when aiming to understand the resource management decisions of individuals.

7.2. Implications for practitioners

Our findings have important implications for practitioners. Educators in public organizations facilitating entrepreneurial activity, such as business plan contests, do not highlight the importance of bootstrapping in their programs. Instead, these organizations focus on decreasing structural or procedural constraints for nascent entrepreneurs by supporting them in formal planning or fundraising activities ([Honig, 2004](#)). Our study highlights that providing specific business training and developing the professional network of nascent entrepreneurs enable them to engage in bootstrapping, which frequently might be a more economical and more promising solution in addressing resource constraints. Therefore, this person-focused approach should merit more attention ([Edelman and Yli-Renko, 2010](#)).

7.3. Limitations and directions for future research

Our research has different limitations. It is possible that the founding team composition aspects affect the resource management choices in nascent ventures. Still, the effect on our findings should be minor because the team size is quite small, consisting of only three team members on average. Furthermore, we controlled for the team size. Additionally, in an unreported analysis to test the robustness of our results, we substituted the team size variable with a dummy variable indicating single founder ventures and received comparable results.

In addition, our analyses rely on the subjective opinions of the nascent entrepreneurs regarding the extent to which bootstrapping methods are being used. While our measures are common proxies to capture the individual background of founders, they are proxies and do not necessarily measure expertise gained or displayed in the founding process. Following our theoretical underpinnings, they are a measure for socialization experiences that the founders had been exposed to previously, which in turn, affect how these individuals pursue business opportunities. To advance research in this realm, opportunities exist to develop our measurements further.

Finally, despite the strong effect of the business environment, our research may underestimate the variation in geographical munificence. For example, our sample frame included exclusively nascent ventures active in major cities, hence excluding rural areas. Nevertheless, [Winborg and Landström \(2001\)](#) showed that the opportunities to bootstrap vary with differences in geographical environments. The urban regions sampled in our research might provide more munificent environments than rural areas do, leading to different bootstrapping practices in different geographical areas ([Harrison et al., 2004](#); [Winborg and Landström, 2001](#)). Further exploring how regional characteristics, together with entrepreneurial characteristics, shape the use of bootstrapping strategies could provide a fruitful avenue for further research.

We propose some additional avenues of future research. Regarding the behavioral research stream, our research has just begun to unravel individualistic antecedents of bootstrapping and calls for a deeper understanding of the relationships. An intriguing aspect is the behavior of experienced entrepreneurs, whose level of experience does not seem to be related to bootstrapping activities. Do they refrain from bootstrapping activities because they have more alternatives, which would enhance the notion of bootstrapping as forced behavior, or because they understand how bootstrapping affects venture development, which would suggest a strategic approach to bootstrapping? Are entrepreneurs with higher levels of human capital more or less risk averse? And would this affect their bootstrapping behavior? Further, we proposed two routes through which an entrepreneur's social capital might enhance bootstrapping activities: increased access to information and increased goodwill. Understanding which of the two routes is important for developing a deeper understanding of the role of an entrepreneur's social network. While we failed to find moderating relationships between an entrepreneur's human capital, social capital, and the environment, further theorizing and testing potential substitution and complementary effects might be a fruitful avenue for future research.

Further, our sampling frame – nascent ventures that participate in a business plan contest – creates a bias, which means that our results might not be representative of the population of nascent ventures. The focus of the study was, however, on high potential ventures, making our sample frame relevant. Expanding our research to other types of nascent ventures, or to high growth oriented nascent ventures that do not participate in a business plan competition, is relevant to understand the boundaries of the current findings.

Given the discovered individualistic antecedents of the bootstrapping approach, we suggest the development of the bootstrapping construct into a more strategic construct of entrepreneurial resource management (Sirmon et al., 2007). As of now, the bootstrapping construct focuses on operational financing and joint resource utilization activities and is predominately presented as forced behavior due to lack of alternatives. As such, it undermines the power of bootstrapping as a coherent strategic approach across the acquisition, integration, and deployment of human, financial, organizational, and physical resources to quickly establish a self-contained organization.

The effectual logic of non-predictive control – rooting entrepreneurial action in who the entrepreneurs are, what they know, and whom they know to proactively exploit contingencies – could provide a suitable framework for this approach (Davidsson et al., 2007; Politis et al., 2008; Sarasvathy, 2001). Regarding the resource management literature, we concentrated on disentangling the drivers of bootstrapping activity. Clearly, the literature is still missing an analysis of the impact of resource management related actions. Recently, initial attempts have been made by Ebben (2009), Perry et al. (2008), and Vanacker et al. (2011). However, a contingency approach was lacking and the authors mainly focused on the financial dimension of resource management. Future studies should explicitly consider that the management of different resource groups within a venture – not only financial – has implications on organizational development and should be considered simultaneously (Edelman and Yli-Renko, 2010; Mishina et al., 2004). Further, future research should also take into account important contingencies. This study hopefully provides fertile ground for measuring the impact of specific resource management activity on different dimensions of venture development.

Appendix A. Bootstrapping items, factors, and reliabilities

Bootstrapping method	Factor	Explained variance	Factor loadings				Descriptives	
			1	2	3	4	Mean	Std. dev.
Cease business relation with late payers	Customer related (Cronbach alpha = 0.83)	26%	0.69	0.02	−0.13	0.08	3.22	1.99
Choose customer who pay quickly			0.66	0.01	0.06	0.05	3.67	2.21
Offer customers discounts if paying cash			0.67	0.13	0.20	−0.07	2.79	2.05
Obtain advance customer payments			0.62	0.22	0.16	−0.18	3.53	2.22
Use routines for speeding up invoicing			0.72	0.06	0.02	0.29	3.61	2.21
Use interest on overdue payment			0.71	0.15	0.00	0.16	2.75	1.99
Negotiate best conditions with suppliers	Joint resource utilization (Cronbach alpha = 0.77)	12%	0.50	0.01	0.24	0.28	4.49	2.16
Share employees with others			−0.05	0.73	0.09	−0.10	2.66	1.88
Share equipment in common with others			0.22	0.75	0.13	0.27	2.80	2.00
Share premises with others			0.11	0.79	0.02	0.13	3.09	2.17
Bundle purchases with others			0.19	0.65	0.07	0.28	2.98	2.12
Obtain loans from relatives/friends			0.08	0.04	0.54	0.18	2.98	2.06
Use of own credit card	Internal self-financing (Cronbach alpha = 0.64)	10%	−0.09	−0.01	0.60	0.23	2.58	2.08
Withhold own salary			0.07	0.03	0.56	−0.17	3.80	2.41
Delay payment to suppliers			0.09	0.15	0.75	0.03	1.92	1.50
Delay payment of taxes			0.14	0.09	0.71	0.11	2.03	1.74
Borrow equipment from others			0.08	0.26	0.35	0.65	2.98	1.92
Lease equipment instead of buying			0.21	0.21	0.07	0.79	2.90	2.09

Survey respondents were asked to indicate on a seven-point Likert scale the degree to which they use each technique in their venture. The Likert scale ranged from 1 (not at all) to 7 (very high use). Bold indicates items included in the factor.

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