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The Role of Incubator Support in New Firms Accumulation of Resources and Capabilities

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The Role of Incubator Support in New Firms Accumulation of Resources and Capabilities

Entrepreneurs need to accumulate different types of resources and capabilities to gain a competitive advantage for their firms, often in settings characterized by uncertainty and complexity. The purpose of business incubators is to provide new firms with a structured and nurturing environment during the early development stages and thus help firms accumulate the necessary capabilities and resources for development and growth. Drawing from an organisational sponsorship framework, this study examines the role of incubator support, referred to as buffering and bridging mechanisms, in the accumulation of capabilities and external resources in new firms. We conceptualize two types of buffering mechanisms in the context of business incubation: sheltering and building. Acknowledging that incubator services may differ in their influence on firm development, and that such influence depends on the extent to which the firms actually utilize the provided services, this study analyses firms' use of various incubator services, and its effect on their accumulation of resources and capabilities. Analyses of data collected from 253 tenant firms of business incubators in Norway suggest that the bridging mechanism (i.e. external network support) and the sheltering mechanism provided by incubator management are important for firms to acquire external resources (i.e. financing, new customers) and to develop capabilities (i.e. organisational processes and routines). This study highlights the importance of different incubator support mechanisms for the resource and capability accumulation of new firms.

Keywords: business incubator; organisational sponsorship; bridging; buffering; capabilities; external resources

Introduction

New firms can be particularly fragile because they often lack the necessary resources and capabilities to overcome the *liability of newness* (Stinchcombe, 1965) and the *liability of smallness* (Aldrich & Auster, 1986). The liability of newness refers to new firms' lack of visibility in the market and underdeveloped organisational processes and routines. Due to low levels of legitimacy, new firms often experience difficulty establishing stable exchange relationships and accessing resources from the environment. Thus, the risk of failure is much higher for new firms than for established organisations (Stinchcombe, 1965). Similarly, the liability of smallness refers to the impact of size on survival, as small firms often lack the financial and managerial resources to compete with larger firms (Aldrich & Auster, 1986). Thus, business incubators are established to circumvent these liabilities through the provision of a supportive environment for new firms (Bøllingtoft, 2012). By offering a combination of services – office space, business support and access to networks – the incubator aims to compensate for the resource constraints that new firms face.

However, the value of incubators for new firm success (e.g. survival, growth, innovativeness) has been questioned (e.g. Amezcua, Grimes, Bradley, & Wiklund, 2013; Schwartz, 2009, 2013; Tamasy, 2007; Tavoletti, 2013). Further, scholars have pointed out that incubators vary in terms of their goals, incubation models and the range of services they provide (Bergek & Norrman, 2008; Bruneel, Ratinho, Clarysse, & Groen, 2012; Grimaldi & Grandi, 2005), with potential consequences for various types of performance (Barbero, Casillas, Ramos, & Guitar, 2012). This suggests that differences in the types of services offered by incubators matter for firm development. Extending these insights, this study examines the extent to which different types of incubator support influence tenant firms' accumulation of capabilities and

resources. Contrary to most previous studies measuring the influence of incubators on new firms (e.g. Barbero et al., 2012; Hackett & Dilts, 2008), we acknowledge that the potential effects of incubator support depends not only on the services provided but also on the extent to which the tenants actually make use of the services (Bruneel et al., 2012; Van Weele, van Rijnsouwer, & Nauta, 2017). We therefore ask as follows: *To what extent does the utilization of incubator support influence new firms' accumulation of capabilities and resources?*

To address this question, we use the conceptual framework of organisational sponsorship. Organisational sponsorship is defined as 'attempts to mediate the relationship between new organisations and their environments by creating a resource-munificent context intended to increase survival rates among those organisations' (Amezcuca et al., 2013, p. 1628). In other words, organisational sponsorship intends to help new firms access necessary resources to increase their chances of survival. It can play a variety of roles in buffering and/or bridging new firms (Amezcuca et al., 2013). The buffering mechanism relates to the isolating role that the incubator provides for tenant firms, sheltering them from environmental threats and uncertainty, to give them time to develop their organisational capabilities. Buffering can also involve the direct transfer of knowledge, capital and labour to new firms to help build robust organisations. The bridging mechanism involves connecting new firms with external resource providers, thereby increasing their external resource acquisition opportunities.

This paper contributes to the literature in at least two ways: First, it adds to the literature on business incubators and the debate on whether incubators add value to new firms. While the majority of incubator performance studies focus on outcomes, without considering how incubators assist tenant firms, this study examines the relationship between incubator support, referred to as buffering and bridging mechanisms, and the development of new firms. Thus, it sheds light on the insides of 'the black box' of incubation (Bergek & Norrman, 2008; Hackett &

Dilts, 2008). Further, this research responds to calls for studies on incubator performance measured at the firm rather than the incubator level (Clausen & Korneliussen, 2012; Scillitoe & Chakrabarti, 2010).

Second, this study adds to the literature on organisational sponsorship by further conceptualizing and testing the relationship between sponsorship mechanisms and new firm development. The organisational sponsorship literature explicitly describes sponsorship as helping to access external resources through networks of potential external partners, but it more vaguely refers to the contribution of sponsorship to internal organization building, such as the development of internal operations and the learning of new roles and routines (Combs, Ketchen, & Hoover, 2004; Mitsuhashi, Shane, & Sine, 2008). Adding to this, we conceptualize the latter as organisational capabilities, arguing that creating robust new ventures demands not only resource access but also the ability to deploy resources through organisational routines and practices (Amit & Schoemaker, 1993). More specifically, we test whether sponsorship mechanisms contribute to firms' capability development.

Moreover, this study contributes to the understanding of sponsorship mechanisms and how they work. In particular, we conceptualize two types of buffering mechanisms in the context of business incubation. The *sheltering mechanism* isolates and shelters the new firm from environmental threats and uncertainty, giving the new fledging organization time to develop their resources and capabilities into a robust organization that can better cope with the liabilities of newness. The *building mechanism* represents efforts taken to help the new firm build their organization through the direct transfer of knowledge or coaching. Further, we add to the complexity of sponsorship theory by hypothesizing that the bridging and buffering mechanisms can contribute to both capability development and external resource acquisition, hence challenging the view that the buffering mechanism enhances the internal development of the new

firm, while the bridging mechanism contributes to the acquisition of external resources (Amezcu et al., 2013). In addition, while previous studies have examined the effect of sponsorship on firm survival (Amezcu et al., 2013), this study takes a step back and tests short-term effects on new firms' resource and capability accumulation.

Theory and hypotheses

Business Incubators

Entrepreneurs frequently face problems, mistakes and resource constraints when they pursue different directions for their newly established firm (Van de Ven, 2017). The resources and capabilities required for starting a new firm are often substantial and may quickly exceed those of the entrepreneurs involved (Busenitz & Arthurs, 2007). Entrepreneurs often need support in gathering capital investment, pursuing suppliers and customers and developing their new role and business model (Katila, Rosenberger, & Eisenhardt, 2008; Lounsbury & Glynn, 2001; Zott & Huy, 2007). Business incubators are created to help new firms accumulate the necessary resources and develop a robust organization to increase their chance of survival and to become economically viable and grow (Aernoudt, 2004; Khorsheed, Al-Fawzan, & Al-Hargan, 2014).

Incubator services have been developed over time (Bergek & Norrman, 2008; Bruneel et al., 2012). The first incubator was established in New York, USA in 1959 (Aerts, Matthyssens, & Vandenbempt, 2007). First-generation incubators emphasized physical infrastructure, including affordable office space and administrative support. The 1980s saw the emergence of second-generation incubators and promoted new technology-intensive companies, which needed more than just physical infrastructure to survive. Therefore, business support services, such as coaching and training in management and marketing, were included in order to help develop new firms.

Third-generation incubators, which emerged in the 1990s, focused on network access to potential customers, suppliers, partners and investors. Access to these networks provided external resources, knowledge and legitimacy (Bruneel et al., 2012). Hence, incubators can provide three broad sets of services: (1) physical infrastructure, (2) business support and (3) networks. It is argued that scholars need to consider that incubators differ in terms of the services they provide to tenant firms (Vanderstraeten & Matthyssens, 2012) and that tenant firms may differ in regard to which service offerings they may use (Bruneel et al., 2012; Van Weele et al., 2017). Thus, there is a need for an inquiry into how specific services offered by incubators contribute to the development of tenant firms from fledging new ventures to robust organisations with an increased likelihood to survive and prosper.

In line with the incubator literature, we argue that incubators can support new firms in their efforts to access external resources and in striving to develop the requisite capabilities to overcome the liability of newness. We conceptualize capabilities as ‘the ability to assemble, allocate and apply resources within the firm to become competitive’ (Adams, Alexander, & Öberg, 2014, p. 3). In line with Amit and Schoemaker (1993), we emphasize the development of organisational processes in making tenant firms capable of deploying their resources in a way that helps them perform in an uncertain environment. Developing effective organisational capabilities is crucial to new firms’ long-term success (Lichtenstein & Brush, 2001). Hence, the extent to which incubators are able to support new firms’ capability development can determine the long-term outcomes of incubation. However, so far the results are scarce on the effect of incubators on resource and capability development in tenant firms.

Organisational sponsorship

Flynn (1993b) refers to organisational sponsorship as government, business and/or university efforts to support and contribute to the survival of new firms, including business incubators, tax subsidization and other governmental initiatives. Flynn (p. 51) states that the attempt to create a 'richer, more nurturing environment can be defined as the process of sponsorship'.

Organisational sponsorship is believed to increase the rate of survival by giving new firms access to necessary resources and information (Flynn, 1993a; Seidel, Packalen, & O'Mahony, 2016) and by creating a network of entrepreneurs who can learn about business from one another (Motoyama & Knowlton, 2016). Two mechanisms can describe how organisational sponsorship increases new firms' survival: It can play buffering or bridging roles in the formation of new firms (Amezcuca et al., 2013). The external environment has been characterized as a locus of potential liabilities and threats for new firms (Shepherd, Douglas, & Shanley, 2000), where buffering can act as a mechanism that allows firms to isolate themselves from the environment in order to form and develop without having to face environmental threats (Amezcuca et al., 2013). In the context of incubation, subsidized office space and consulting services offered by incubators are examples of buffering, as they are directed towards developing the new firm to become more robust.

Organisational sponsorship can also play a bridging role, whereby the sponsor connects new firms to external resource providers. An example of bridging in the incubator context is the network support offered by incubators, where the incubator act as an intermediary between new firms and networks of potential external partners, such as customers, suppliers and financial and funding institutions. According to Amezcuca et al. (2013), the buffering mechanism contributes to

the development of the internal organization, while the bridging mechanism relates to the gathering of external resources.

The bridging mechanism

The bridging mechanism focuses on enhancing inter-organisational relationships between a new organization and external resource providers. A new organization can experience difficulty attracting resources because it lacks legitimacy (Hughes, Hughes, & Morgan, 2007; Packalen, 2007), reputation and a track record (Brush, Greene, & Hart, 2001). The sponsor serves as a connective intermediary between its social networks and the new organization, and it encourages the new organization to attract resources from the external environment by actively engaging in it (Amezcuca et al., 2013).

Organisational sponsorship increases social capital by connecting a new firm with other organisations and sources of knowledge (Flynn, 1993b). The new firm can therefore build and increase its social capital by improving the quantity and quality of its relationships with the external environment (Amezcuca et al., 2013). The enhancement of good relations can signal a leading edge in the market and thereby increase legitimacy (Zimmerman & Zeitz, 2002), which Stinchcombe (1965) describes as the cure for the liability of newness that new organisations face. Legitimacy is often crucial for the survival of new organisations (Starr & MacMillan, 1990), and it is an important intangible resource that enables organisations to acquire other resources (Zimmerman & Zeitz, 2002). With increased legitimacy, external actors are more motivated to provide a new organization with the required resources because they believe that the organization is competent and essential (Zimmerman & Zeitz, 2002).

The literature recognizes business incubators as a mechanism for embedding firms in entrepreneurial networks (Bøllingtoft, 2012; Bøllingtoft & Ulhøi, 2005; Hackett & Dilts, 2004;

Hansen, Chesbrough, Nohria, & Sull, 2000; McAdam & McAdam, 2006; Schwartz & Hornych, 2008). Network support includes acting as an intermediary between new firms and networks of potential external partners, such as customers, suppliers and financial and funding institutions (Schwartz & Hornych, 2010). Access to such networks can help the firm overcome the liabilities associated with newness and smallness and support the development of cooperative relationships, which are important in the early start-up and development stages of new firms.

However, the effectiveness of networking depends on the willingness of entrepreneurs to network (Hughes et al., 2007). Consequently, although incubators may offer network support to their tenant firms, these services will only be effective in helping firms access external resources if these firms use this service. We therefore pose the following hypothesis:

Hypothesis 1a. There is a positive relationship between tenant firms' use of the bridging mechanism and their accumulation of external resources.

While the bridging mechanism provided by incubators appears to influence the accumulation of new firms' external resources, it may also facilitate the development of organisational capabilities. Studies have shown that intra-firm collaboration support capability development (Carnabuci & Operti, 2013). By providing access to networks and external partners, incubators may help firms extend their internal resource base and develop capabilities, as partnerships and collaboration provide opportunities for new knowledge acquisition (Yli-Renko, Autio, & Sapienza, 2001) and capability development (Lane & Lubatkin, 1998). Moreover, building knowledge and capabilities through inter-organisational relationships is faster than developing it internally (Bruneel, Yli-Renko, & Clarysse, 2010). Introducing new firms to venture capitalists and business angels who transfer their knowledge and expertise to the firms in

which they have invested (St-Pierre, Nomo, & Pilaeva, 2011) can also play an important role in professionalizing firms (Hellmann & Puri, 2000). Therefore, incubator support that focuses on connecting firms to other individuals, organisations and networks may facilitate the development of capabilities. Thus, the following hypothesis is posed:

Hypothesis 1b. There is a positive relationship between tenant firms' use of the bridging mechanism and their development of capabilities.

The buffering mechanism

Sponsorship can provide particular interventions that buffer new firms and their dependency on the external environment for resources (Amezcuca et al., 2013). Buffering enables firms to isolate themselves from the environment in order to form and develop without having to face environmental threats (Amezcuca et al., 2013). Through buffering, the sponsor acts as a 'shelter' for a new organization, protecting it from 'running out of fuel' before it is able to attract resources from the environment (Amezcuca et al., 2013; Autio & Rannikko, 2016). As new firms often lack a range of resources and capabilities (Bruneel et al., 2012), the buffering support mechanism allows them time to focus on the accumulation of needed resources and capabilities. Further, a sponsor can help speed up the development process by providing, for example, knowledge and counselling to support organization building (Autio & Rannikko, 2016). In the incubator context, these two aspects of the buffering mechanism represent different types of services provided by the incubator. We therefore distinguish between two types of buffering: sheltering and building.

The *sheltering mechanism* represents the protection of the new venture from environmental threats by offering friendly, stable and resource-munificent environments. Office

space, administrative services and capital provided by incubators shelter new and fledging firms against the unwanted effects of resource scarcity and allow them time to focus on generating necessary capabilities (Amezcuca et al., 2013; Autio & Rannikko, 2016). Sheltering allows entrepreneurs to focus their efforts on developing the new organization without creating strong dependencies on external resource providers or spending too much time dealing with uncertainties (Jourdan & Kivleniece, 2017). Additionally, sharing office space and administrative services with other tenant firms can facilitate knowledge transfer between firms in the same incubator because geographic proximity affects the frequency of contact between tenant firms (McAdam & McAdam, 2006). Thus, we put forward the following hypothesis:

Hypothesis 2a. There is a positive relationship between tenant firms' use of the sheltering mechanism and their development of capabilities.

The *building mechanism* represents the provision of knowledge and contributions to the development of organisational capabilities through competent interaction between the incubator management and the tenant firm. Through consulting services, incubators offer direct knowledge transfer between the incubator management and the new firm (Scillitoe & Chakrabarti, 2010). These services include assistance in developing business and marketing plans (Seidel et al., 2016), recruiting personnel, management, accounting and general legal expertise (Mian, 1996; Scillitoe & Chakrabarti, 2010), all of which are intended to build a robust new firm.

Through experiential learning, firms can develop routines and processes, but it is often a slow and gradual process (Dosi, Nelson, & Winter, 2000). Therefore, the building mechanism can help new firms ascend more quickly on the learning curve, as they can avoid trial and error (Bruneel et al., 2012). Findings from previous studies support these claims. For instance, Rubin,

Aas, and Stead (2015) found that collaboration between tenant firms and incubator management increases tenant firms' technology, market and financial knowledge. Hence, we suggest the following hypothesis:

Hypothesis 2b. There is a positive relationship between tenant firms' use of the building mechanism and their development of capabilities.

While it has been argued that buffering mainly contributes to the internal accumulation of capabilities (Amezcuca et al., 2013; Jourdan & Kivleniece, 2017), we argue that it can also facilitate external resource acquisition. First, the sheltered environment allows entrepreneurs time to develop good strategies for resource acquisition, enabling them to target specific resource providers and develop their 'sales arguments'. Second, affiliation with an incubator can provide legitimacy to new firms, making them more attractive to resource providers (Bøllingtoft & Ulhøi, 2005; Van Weele et al., 2017). Moreover, shared office space and administrative services create networks between tenant firms (McAdam & McAdam, 2006). Tenant firms can share external network contacts (Bøllingtoft & Ulhøi, 2005), which can facilitate external resource acquisition. Following from this, we propose that:

Hypothesis 3a. There is a positive relationship between tenant firms' use of the sheltering mechanism and their development of external resources.

Finally, the building mechanism of buffering can also support external resource acquisition. Interactions between incubator managers and tenant firms through consulting increases the incubator manager's knowledge of the firm's needs and makes it is easier for the

incubator manager to connect the firm with relevant networks (Scillitoe & Chakrabarti, 2010). Previous research has found that collaboration between tenant firms and incubator management increases access to external resources, such as knowledge and financial capital (Rubin et al., 2015). One reason for this is that incubators offer services that are aimed at developing tenant firms' investment readiness (McAdam & Marlow, 2011) and networking skills (Tello, Yang, & Latham, 2012). Hence, while supporting the building of new organisations through consulting services, incubators may also contribute to strengthening tenant firms' ability to attract external resources. Hence, we hypothesize the following:

Hypothesis 3b. There is a positive relationship between tenant firms' use of the building mechanism and their development of external resources.

Figure 1 illustrates the research model with the hypothesized relationships between the bridging, sheltering and building mechanisms and resource and capability accumulation.

Insert Figure 1 about here

Data collection and research methodology

Sample

The research data were gathered from a web-based survey of firms which had a contractual relationship with an incubator supported by Siva¹ (The Industrial Development Corporation of Norway) in 2015. Siva is financed by the government and operates an incubation program intended to contribute to new-firm development. In 2015, the program had 35 incubators distributed across Norway, which were either R&D-oriented (linked to a research environment) or industry-oriented (linked to an industrial firm or a collection of industrial firms). Siva supports incubators by providing capital, expertise and networks. The incubators in the program offer professional business advice, office space, capital and an environment where entrepreneurs, business, academia, R&D environments, investors and others interact. Incubators in Norway are geographically spread, and like in other Nordic countries, most incubators have to actively search for tenant firms rather than selecting from a queue (Alsos, Hytti, & Ljunggren, 2011).

The target group of incubators are firms characterized by innovative ideas with high growth potential, which have the potential to reach a national or, preferably, international market. The incubator managers we interviewed all emphasized the innovativeness and growth potential of ideas as well as entrepreneurs' drive and skills as selection criteria. However, they also highlighted that the threshold for securing a pre-incubator agreement

¹ This section is based on the description of the Incubator Program at Siva (<https://siva.no/om-oss/>) and (<https://siva.no/wp-content/uploads/2015/03/programbeskrivelse-inkubator.pdf>)

was not high. Most of the firms located in incubators in Norway are technology-based, including university spin-offs and private innovative firms.

The survey is based on the incubator literature as well as observations, discussions and interviews with both incubator managers and tenant firms. The interviews and observations enabled a solid contextual understanding. Due to our pre-studies of business incubators in various cities in Norway, we were able to qualitatively investigate each instance of sponsorship in an effort to develop rich measures of incubator-related services. This provided for more descriptive measures of sponsorship services. We visited five incubators in the spring of 2015. In total, we conducted seven non-participatory observations of meetings between incubator managers and tenant firms, seven interviews with incubator managers and 13 interviews with tenant firms. We also observed the daily activity in two of the incubators for four-five days. The survey was pretested by four tenant firms, an incubator manager, two other experts and several experienced scholars within the field.

In 2015, there were 818 tenant firms in Siva-supported incubators in Norway. Siva provided a list of all tenant firms along with the email addresses of the CEOs of 798 of these firms. Twenty-seven invalid email addresses meant that we could not reach the intended recipients. Thus, we administered the web-based survey to a total sample of 771 tenant firms in Norway between June and August of 2016. After issuing two email and one telephone reminders, we obtained responses from 261 firms, yielding a response rate of 34%. As some firms did not answer all questions, we ended up with a sample of 253

complete responses. Using a chi-square test on industry and t-tests on firm age, we detected no statistically significant response bias between the respondents and non-respondents.

We also tested for self-selection bias, since tenant firms can self-select into incubators that offer services that can best address their needs. However, as mentioned, incubators in Norway are geographically spread, and the geographic distance between incubators often means that new firms do not select between incubators. We also used our quantitative and qualitative data to test for self-selection bias. Moreover, the survey contained information about which services the firms in the same incubator used. In the data, there were eight incubators with more than 10 respondents. For these incubators, the tenant firms used different types of services, indicating that the tenant firms in the same incubator had different needs. The information obtained from the interviews reveal why the tenant firms chose to apply and what services they used, and the tenant firms recorded different reasons for applying for the same incubator. Some firms wanted to be connected with the incubator because of the services (e.g. help with patenting, financing), others because of the legitimacy of being connected with an incubator, with some having applied 'by coincidence'. Regarding the incubator services used, the interviewed firms used different services. Almost all the firms used some type of consulting and/or networking service. However, this varied in terms of the types of consulting and networking services used. For infrastructure, some firms were located within the incubator, while others were located elsewhere. There were also variations in the use of financing and administrative services. The incubator managers emphasized that the help they provided for their firms

varied according to the firms' needs, with help being tailored to fit the firms' need as they developed.

To exclude the potential endogeneity effects related to differences between tenant firms as an influential factor in their choice to use incubator services, which could also be directly related to the dependent variables, we compared the characteristics of firms using few services with those using many. The groups were compared in terms of social capital prior to sponsorship, the entrepreneur's experience prior to sponsorship, whether they were a team start-up and the status of the new firm when entering the sponsorship (e.g. development stage). We found significant differences regarding social capital between low and high users of bridging and building services. As social capital was correlated with the dependent variables (see Table 1), we added it as a control variable in the regression analyses. There was also a significant difference between low and high users of building services in terms of status prior to sponsorship. Although this variable was not significantly correlated with the dependent variables, and hence not likely to cause endogeneity effects, we chose to include it as a control variable. There were no significant differences between high and low users of services related to the other characteristics.

Variables and measures

Dependent variables

External resources refers to different resources that the firm acquires externally, such as new key employees, new directors, new customers, new suppliers, financing and access to new technology. Drawing from literature on business incubators, organisational sponsorship and

resource dependence theory, we developed a model with nine items for external resources, which is a formative measure. The respondents were asked to state the extent to which the company had acquired nine different resources over the past year, using a 7-point Likert scale ranging from 1 = a very small extent to 7 = a very large extent (see Appendix A for specific measures). The variable was a mean score of these nine items. We designed the items to portray the extent to which a firm had acquired these nine different resources in the past year. We chose a one-year time frame for the external resources construct to make sure that the time between the use of the service and the proximal outcome was sufficiently short to substantiate a relationship and create a consistent scale across the sample. We tested the measure for validity by checking the correlation among the items, the correlation between an indicator and its construct's significance and the conceptual overlap between the indicators. The items were retained based on recommendations from Cenfetelli and Bassellier (2009).

Capabilities reflect the development of routines and processes for developing and improving products or services. Based on Yam, Guan, Pun, and Tang (2004) and Adler and Shenbar (1990), we developed a model with four capability items. The respondents were asked to indicate, on a scale from 1 (strongly disagree) to 7 (strongly agree), whether different statements described their company in terms of routines for developing and improving products or services (see Appendix B for specific statements). The variable was a mean score of these four items. An exploratory factor analysis identified all four items as one latent factor, with factor loadings of 0.80, 0.81, 0.83 and 0.77 (eigenvalue = 2.58; 64.47 % of variance explained). Cronbach's alpha was 0.81.

Main explanatory variables

Our three main explanatory variables measured the use of incubator services. We constructed measures for bridging, sheltering and building based on the organisational sponsorship literature. The respondents were asked to indicate whether the incubator offered various services and whether the firm had used each of these services. They could answer ‘yes, and use/have used activity/service’, ‘yes, but have not used activity/service’, ‘no’ and ‘don’t know’. The bridging, sheltering and building variables recorded the number of times a respondent answered ‘yes, and use/have used’.

The *bridging* variable concerned the degree to which the incubator connected the new firm with external resource providers. Examples of external resource providers are industrial partners, established firms, other entrepreneurs, researchers, banks, investors, customers and suppliers. The respondents could state whether the tenant firm had used networking support in eight different categories. The variable ranged from 0 (none of the above-mentioned activities are used) to 8 (all activities are used).

The *sheltering* variable involved the direct transfer of resources between the incubator management and the new firm and included shared office space, administrative services and capital provided by the incubator. The variable ranged from 0 (none of the services are used) to 3 (all services are used).

The *building* variable involved the direct transfer of knowledge between the incubator management and the new firm and ranged from 0 (none of the services are used) to 6 (all services are used). The specific measures are presented in Appendix C.

Control variables

We included several control variables concerning the entrepreneurs and firms, which we based on the previous literature and assumed would influence the studied relationships.

Social capital prior to sponsorship refers to the extent of a firm's networks and relations with individuals, which could provide resources prior to entering the incubator. A large network before incubation can imply that the firm or founder had a high level of social capital prior to sponsorship, which would mean that they are better at attracting resources than firms with low levels of social capital. The respondents indicated their agreement on a scale from 1 (very limited) to 7 (very extensive) on the following six categories: '(Potential) customers', '(Potential) suppliers', 'Public financing institutions', '(Potential) investors', '(Potential) collaborators' and 'Competitors'. The variable was constructed as a mean scale of the six categories.

Experience prior to sponsorship. Prior experience may be important with regard to the willingness and ability of new firms to accumulate internal capabilities and external resources. First-time founders are often characterized by a larger knowledge gap than experienced entrepreneurs (Westhead & Wright, 1998). Additionally, industry and management experience are found to be especially important in relation to receiving equity funding (MacMillan, Siegel, & Narasimha, 1986). Prior experience could either minimize firms' need for incubator assistance, thereby reducing its use, or it could enhance its effects, as firms are more predisposed to accumulating the resources offered. Experience prior to sponsorship was constructed as a mean scale of how many years of experience the founder had with six different types of firm experience – such as leadership, product/service development, market and sales, business development, production/distribution of product/services and entrepreneurship – before the firm became an incubator firm. The respondents could answer in terms of yearly intervals.

Team. Empirical studies have found that firms founded by teams are more successful than those founded by individuals (Cooper & Bruno, 1977). Particularly in knowledge-intensive dynamic industries, it is claimed that teams are stronger at establishing more powerful networks (Lechler, 2001). Thus, we controlled for team by creating a binary variable that indicates whether or not the firm was a team start-up.

Status prior to sponsorship measures how developed the firm was when it was admitted to the incubator. The development stage before sponsorship can affect the need for accumulating capabilities and external resources. Therefore, the respondents had to provide information about the status of their firm when they were first accepted into the incubator: ‘The firm was not established, and the development of the business idea was central’; ‘the firm was newly established/in the process of being established’; ‘early operating phase without significant sales revenue’; ‘established operating phase with significant sales revenues’; ‘established operating phase focusing on new geographic markets and/or business areas’ and ‘the company was well established but in need of efficiency/new ideas’.

Prior to conducting the regression analysis, correlation (Table 1) and multicollinearity analyses were performed. The correlation analysis revealed that bridging, sheltering and building were significantly highly correlated (between 0.32** and 0.47**). This means that the three mechanisms were connected and were often used in combination. Table 1 also presents descriptives of the sample. The independent variables contained no issues regarding multicollinearity (VIFs ranged from 1.02 to 1.49).

Insert Table 1 about here

Results

OLS regression analysis was used to examine our research question and test our hypotheses. Tables 2 and 3 present the hierarchical regression results for two dependent variables: external resources and capabilities. In the two tables, Model 1 is the base model with the four control variables. In Models 2, 3 and 4, we tested the hypotheses by adding bridging (Model 2), sheltering (Model 3) and building (Model 4) to the base model. The last model, Model 5, includes all the independent and control variables.

Insert Table 2 and 3 about here

In Table 2, the results from Model 1 suggest that external resource acquisition for tenant firms had a positive and significant relationship with the firms' social capital prior to sponsorship, while the founders' experience prior to sponsorship, the firms' status prior to sponsorship and whether or not the firms were team start-ups were not significant. The results from Models 2 and 3 suggest that the bridging (Model 2) and sheltering (Model 3) mechanisms provided by incubator management were related to external resource acquisition, provisionally supporting hypotheses 1a and 3a. Hypothesis 3b was not supported (Model 4). Model 5 includes all the independent variables, in addition to the control variables, and confirms the support for hypotheses 1a and 3a.

In Table 3, the results from Model 1 suggest that the firms' social capital prior to sponsorship and the founders' experience prior to sponsorship were related to capability building.

The binary variables of team and status prior to sponsorship were not significant. The results from Model 2, 3 and 4 suggest that the bridging (Model 2), sheltering (Model 3) and building (Model 4) mechanisms provided by incubator management were connected to the development of capabilities in the tenant firms, provisionally supporting hypotheses 1b, 2a and 2b. Model 5 includes the three independent variables and the control variables. This model confirms support for hypothesis 1b, but the sheltering and building mechanisms no longer had a significant effect when we controlled for bridging, indicating that hypotheses 2a and 2b were only partly supported.

Discussion

Contributing to the discussion on the potential effect of business incubators (Autio & Klofsten, 1998; Phan, Siegel, & Wright, 2005; Schwartz, 2013), we applied a sponsorship framework to examine the role of incubator support in the development of new firms. More specifically, we operationalized a variety of services, typically offered by incubators, into the bridging and buffering mechanisms and examined the relationship between these mechanisms and new firms' accumulation of resources and capabilities.

Bridging mechanism and the accumulation of resources and capabilities

Conceptualizing the bridging mechanism as services where incubators connect firms to external stakeholders, we hypothesized that utilizing such support could help firms gain access to external resources as well as develop their capabilities. We found that the bridging mechanism was significantly and positively associated with firms' resource acquisition and capability development. In terms of the positive relationship between bridging and resource acquisition, several researchers have acknowledged the importance of business incubators, as they embed

new organisations in networks and facilitate their credibility, which could ultimately enable access to resources (Bøllingtoft, 2012; Bøllingtoft & Ulhøi, 2005; McAdam & Marlow, 2008; McAdam & McAdam, 2006). Our results confirm and extend this literature by showing that external resource acquisition depends on the extent to which new firms utilize the bridging services offered by the incubator.

While bridging is subsumed under arguments of legitimacy and externality (Autio & Rannikko, 2016), our results indicate that it is also positively related to internal capability development. Bridging may promote knowledge spillovers and experience exchange (Autio & Rannikko, 2016), which can act as inputs in the development of capabilities. This finding aligns with previous research suggesting that firms develop capabilities through networking activities, as networks provide access to new ideas, facilitate collective learning (Jack, 2005; McAdam & Marlow, 2008) and provide access to information, knowledge and expertise (Bøllingtoft, 2012). Further, venture capitalists and business angels connected to the incubator may provide advice that help the professionalization of tenant firms (Hellmann & Puri, 2000) in terms of their resource deployment. This extends previous discussions of sponsorship theory, suggesting that bridging mainly contributes to external resource acquisition (Amezcuca et al., 2013). We suggest that while the bridging mechanism facilitates access to external resource providers, it also supports new firms' development of capabilities.

Buffering mechanisms and the accumulation of resources and capabilities

Our findings also shed light on the role of buffering mechanisms in incubator support. Conceptually, we distinguished between two types of buffering: sheltering and building mechanisms. Sheltering represents the protection of new firms from environmental threats by offering stable and resource-munificent environments, while building represents the provision of

knowledge by the incubator management to the tenant firms. We found support for this distinction in our data. Although the use of sheltering and building mechanisms were correlated, they were clearly distinct mechanisms, which also related differently to the outcome variables. In terms of the sheltering mechanism, we found a strong relationship between the firms' use of the infrastructure provided by the incubators and their accumulation of both external resources and capabilities. The building mechanism, however, was only weakly associated with the firms' capability development and was not significantly related to their acquisition of external resources. Interestingly, our findings suggest that affiliation to an incubator and the infrastructure and co-location with other tenant firms contribute more strongly to the development of capability and access to external resources and that the consulting services offered by the incubator play a much less significant role in this. This finding contradicts arguments in the literature showing that interaction with incubator management and value-added services is important in developing new firms (Rice, 2002; Scillitoe & Chakrabarti, 2010). However, the value of buffering for capability development and external resource access may lie not in the direct contact with the incubator manager but in the cross-company learning within the incubator through the sheltering mechanism. These findings emphasize the importance of the co-location of new firms (Bergek & Norrman, 2008; Bøllingtoft, 2012) in sharing experiences and acquiring business knowledge that help tenants develop their capabilities.

Overall, the results suggest that the bridging and sheltering mechanisms are particularly important in the development of new firms, as they both contribute to increasing firms' resource access and capability development. While infrastructure is considered the basic function of most business incubators (Bruneel et al., 2012), using the sheltering mechanism through the option to co-locate and strengthen the affiliation with the incubator seems to help protect new firms from

environmental threats and uncertainty, giving them time to develop their resources and capabilities.

Implications for theory

Most incubator performance studies focus on outcomes, without considering how these incubators assist tenant firms. This study examined the relationship between incubator support and the development of new firms and contributed to shedding light on the insides of ‘the black box’ of incubation processes (Bergek & Norrman, 2008; Hackett & Dilts, 2008). Further, this research responded to calls for studies of incubator performance measured at the firm rather than the incubator level (Clausen & Korneliussen, 2012; Scillitoe & Chakrabarti, 2010) and showed that firms’ utilization of incubator services matter for their accumulation of resources and capabilities.

This study adds to the literature on organisational sponsorship by further conceptualizing and testing the relationship between sponsorship mechanisms and new-firm development. In particular, we conceptualized two types of buffering mechanisms in the context of business incubation: sheltering and building. While these mechanisms are both parts of the buffering function of sponsorship, they are clearly distinct and buffer fledging new firms in different ways. The sheltering mechanism stems from a developed infrastructure that facilitates venture development, while the building mechanism results from efforts undertaken to actively transfer knowledge and coaching to support and accelerate such development. Our findings suggest that sheltering is more important in the incubator context. However, future studies are needed to confirm this finding.

Further, organisational sponsorship theory emphasizes that the buffering mechanism contributes to the development of internal resources and capabilities, while the bridging

mechanism focuses on the acquisition of external resources (Amezcuca et al., 2013). We argue that this clear distinction between sponsorship mechanisms and how they work is somewhat simplistic and that we also need to acknowledge knowledge overflows and more complex relationships. The results of this study suggest that the bridging and buffering mechanisms can both contribute to internal capability development and external resource acquisition. These findings point to the need for more process-oriented perspectives to study sponsorship mechanisms. In line with (Jourdan & Kivleniece, 2017), we argue that there is a need for deeper ‘insights into the theoretical notion of sponsorship and its organisational-level effects’ (p. 55).

Moreover, while previous studies have looked at the effect of sponsorship on firm survival (Amezcuca et al., 2013), this study took a step back and tested the short-term effects of key aspects within sponsorship theory in the context of business incubators on new firms’ resource and capability accumulation. This approach allowed us to empirically differentiate between the actual use of the bridging and buffering mechanisms, while also examining their influences on new-firm development, rather than simply assuming that potential differences between sponsored and non-sponsored firms stem from such mechanisms.

Implications for practice

Our findings have a number of implications for incubator managers, entrepreneurs, policymakers and organisations that support incubators. First, this study offers insights into which mechanisms enable firms to accumulate capabilities and external resources. We therefore suggest that incubator managers should acknowledge their potential influence and plan their strategy according to their resource needs. Our findings suggest that incubator managers should emphasize services that bridge tenant firms with external networks contacts that can help develop capabilities and external resources. Further, the results point to the value of the incubator

infrastructure that shelters tenant firms, while they downplay the value of services aimed at capability development.

For entrepreneurs, the actual use of services offered by incubators could determine the extent of the capabilities and resources they accumulate in the gestation process. One way to overcome liabilities is to take advantage of the incubator services provided, particularly network-extending services and infrastructure. Furthermore, it is important for policymakers and others who are interested in stimulating entrepreneurial development to acknowledge the diversity of tenant firms in terms of their tendency to use incubator services and that this diversity is meaningful in relation to outcomes.

Limitations and future research

Although this study provides important insights into the relationship between incubator support and firms' resource accumulation, it also has limitations. First, the cross-sectional data did not allow us to test causal relationships. Future research using longitudinal methods is needed to better understand how the variables change over time and to investigate the mechanisms through which sponsorship influences the accumulation of capabilities and resources. Further, future longitudinal studies could also examine whether the accumulation of resources and capabilities, with support from an incubator, actually contributes to the survival, profitability or growth of new firms.

Second, the findings from this study show that while variations in tenant firms' use of incubator services influence their development, they provide little explanation as to *why* tenant firms choose to use these services or why they do not. We controlled for factors such as the prior experience of the entrepreneur, the development stage of the venture, whether it is a team start-up and the extent of social capital. However, we could not confirm that there were no potentially

untested factors that could influence this choice or the dependent variables. Future research should examine why incubated firms differ in their use of incubator services in order to help better understand the incubation process and its effects. Third, future studies should look at the relationship between buffering and bridging. In this study, the different sponsorship mechanisms were correlated, indicating that they were interrelated and used in combination. Research on how different combinations of the buffering and bridging mechanisms contribute to firm development may give us new insights into the effectiveness of different incubation models. Fourth, this study was based on Norwegian incubators. While the Norwegian context may not differ extensively from other European contexts, this also presents an opportunity for future studies to extend the analysis to other countries.

Conclusion

The results of this study indicate that incubators can help firms develop capabilities and gain access to resources through the support services they offer; however, this depends on the tenant firms' actual use of the different incubator services. This finding supports the suggestion by Van Weele et al. (2017) that tenant firms that do not take full advantage of incubator services explain the disappointing performance observed among incubators. If adapted well to the needs of tenant firms, incubator sponsorship can contribute to developing the resources and capabilities of new firms, particularly through the infrastructure provided and the efforts aimed at connecting new ventures to external resource holders.

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FIGURES

Sponsorship mechanisms

Resource and capability accumulation

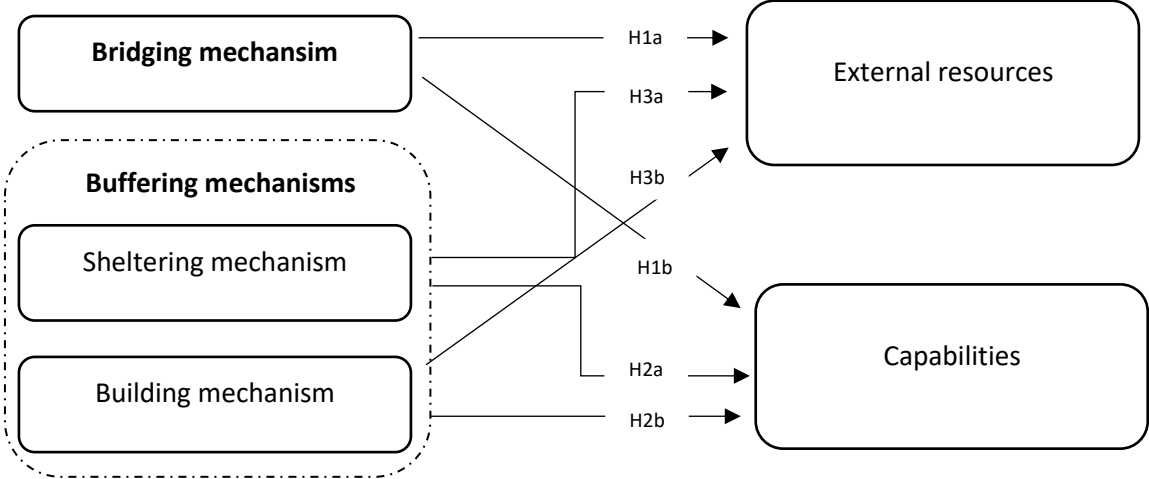


Figure 1. Sponsorship effects on resource and capability accumulation.

TABLES

Table 1. Descriptive Statistics and Correlation Analysis.

Variables	Min.	Max.	Mean	SD	1	2	3	4	5	6	7	8
1. External resources	1	7	3.73	1.42								
2. Capabilities	1	7	5.44	1.33	.45**							
3. Bridging	0	8	3.45	2.17	.20**	.14*						
4. Sheltering	0	3	1.21	1.01	.21**	.18**	.43**					
5. Building	0	6	3.07	2.00	.05	.05	.47**	.32**				
6. Social capital prior to sponsorship	1	6.5	3.39	1.11	.20**	.24**	-.19**	-.01	-.19**			
7. Experience prior to sponsorship	1	7	3.34	1.65	.13*	.20**	-.05	.14*	-.08	.31**		
8. Team	0	1	.64	.48	.12 ⁺	-.00	-.01	-.01	-.08	.11 ⁺	.09	
9. Status prior to sponsorship	1	6	2.18	1.17	.06	.05	-.05	-.10	-.07	.24**	-.03	.00

⁺ p < .10

* p < .05

** p < .01

Table 2. Hierarchical Regression Results - External Resources.

Variables	Model 1		Model 2		Model 3		Model 4		Model 5	
	std.coeff.	(std.error)	std.coeff.	(std.error)	std.coeff.	(std.error)	std.coeff.	(std.error)	std.coeff.	(std.error)
Social capital prior to sponsorship Experience prior to sponsorship Team Status prior to sponsorship Bridging Buffering	.16*	(.09)	.21**	(.09)	.17*	(.09)	.18*	(.09)	.20**	(.09)
-Sheltering					.21**	(.09)			.13*	(.10)
-Building							.10	(.05)	-.03	(.05)
F-value	3.676**		6.274**		5.422**		3.488**		5.070**	
R²	.056		.113		.099		.066		.127	
Adjusted R²	.041		.095		.081		.047		.102	
R² change			.057		.043		.010		.071	

+ p < .10
 * p < .05
 ** p < .01

Table 3. Hierarchical Regression Results – Capabilities.

Variables	Model 1		Model 2		Model 3		Model 4		Model 5	
	std.coeff.	(std.error)	std.coeff.	(std.error)	std.coeff.	(std.error)	std.coeff.	(std.error)	std.coeff.	(std.error)
Social capital prior to sponsorship Experience prior to sponsorship Team Status prior to sponsorship	.20**	(.08)	.23**	(.08)	.20**	(.08)	.21**	(.08)	.23**	(.08)
Bridging Buffering			.19**	(.04)					.14 ⁺	(.05)
-Sheltering					.17**	(.08)			.10	(.09)
-Building							.10 ⁺	(.04)	.01	(.05)
F-value	5.203**		6.161**		5.760**		4.752**		4.756**	
R²	.077		.111		.104		.088		.120	
Adjusted R²	.063		.093		.086		.069		.094	
R² change			.033		.027		.010		.042	

⁺ p < .10
* p < .05
** p < .01

APPENDIXES

Appendix A. External Resources.

External resources:	To what extent has the company during the past year: Acquired new key employees Acquired new directors Acquired new customers in the same market Acquired a foothold in new markets Acquired new suppliers Acquired new partners Received public financing (Innovation Norway, the Research Council and the like) Acquired new owners (investors, investment funds or similar) Acquired access to new technology
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All items are measured on a Likert scale from 1 = a very small extent to 7 = a very large extent.

Appendix B. Capabilities.

Capabilities:	We develop procedures to explore new product/service ideas. We process our ideas for products/services. We develop effective procedures to produce/deliver our products/services. We develop further our products with the aim of lowering production costs or improving quality.
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All items are measured on a Likert scale from 1 = strongly disagree to 7 = strongly agree.

Appendix C. Incubator Support: Bridging and Buffering (Sheltering and Building).

Bridging:	<p>Does the incubator offer activities to set firms in contact with:</p> <ul style="list-style-type: none"> Industrial partners Established firms Other entrepreneurs Research and innovation communities (researchers, universities, institutes) Financial sources (e.g. banks, Innovation Norway, the Research Council, investors, funds) Commercialization Stakeholders (e.g. Technology Transfer Office) New customers New suppliers
Buffering:	<p>Does the incubator offer the following (advice and/or assistance):</p>
Sheltering:	<ul style="list-style-type: none"> Effective joint administrative services Competitive office-space Funding (money, capital)
Building:	<ul style="list-style-type: none"> Product/service development Market/customer (e.g. define market and customer group, develop market strategy, market introduction) Organisational development (e.g. recruitment of staff, procurement of resources) Financing (e.g. help with funding requests) Business development (e.g. writing business plan, developing a business model, strategy development) Development of financing/administrative procedures (accounting, budgeting, billing)

Respondents could answer: “yes, and use/have used activity/service”, “yes, but have not used activity/service”, “no” and “don’t know”.