Bound for glory or cursed for life? Exploring the impact of initial resources on the venture emergence of new technology-based firms

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Abstract: The value of existent firm’s resources in uncertain and dynamic contexts is unclear. It is difficult to determine whether starting a new firm with a strong resource position will give an advantage in technology-intense contexts. We propose a revision of the role of resources in new tech-based ventures. We adopt a mixed-method approach. We use the cases of 21 new technology firms to build propositions on what factors (resources) play a role in new venture emergence. We then test to what extent those resources make an effect on the new venture emergence using a longitudinal dataset of 400 new technology-based firms. The results show that not all resources matter equally in the early-stages of a new technology-based firm. We identify that specific combinations of entrepreneurial experience and industry knowledge has a positive impact, while other resources such as technology assets, surprisingly, do not generate a clear impact.

Keywords: technology entrepreneurship; venture emergence; technology resources; panel dataset.


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1 Introduction

The transformative potential of new technologies in the hands of ambitious entrepreneurs has captured the attention of investors and governments for decades (Autio et al., 2018). Technology-based firms are regarded as a driver of economic growth and innovation; they have been portrayed as the ‘spur’ that ignites technology innovation across industries and countries (Lerner, 2010; Minola et al., 2017).

New technology-based ventures face two key challenges: technology and market development (Brem and Borchardt, 2014; Hsu, 2008). Promising new ventures that solely focus on their technology often fail to exploit the market opportunity, unable to find that valuable application that makes their product or service unique (Choi et al., 2008).

We assume that starting with a strong resource position could be a sustainable advantage for a new firm, in particular if they are unique, difficult to replicate, and valuable for the type of business that the firm aims to conduct (Kolvereid et al., 2018; Nason and Wiklund, 2018). But resource centric views have been challenged in dynamics context like the ones that new technology-based firms (NTBFs) face (Bhawe et al., 2016; Klyver and Schenkel, 2013; Newbert et al., 2008). To advance in this discussion, researchers have suggested taking more granular views of the performance measure, for instance looking at venture emergence indicators to track the evolution of the new firm (Lichtenstein et al., 2006). It has also been argued that such type of firms might need more time to develop; therefore cross-sectional surveys might miss the time-lagged effects of resource positions in the development of the new firm (Davidsson and Gordon, 2012).

As a result, two elements motivate this study: absence of a clear relationship between the possession of resources, entrepreneur’s actions, and entrepreneurial performance (Newbert et al., 2008); and the limited understanding of the particularities of NTBFs (Brown, 2013; Hsu, 2008; Minola et al., 2017).

We propose to revise the effect of resources in the venture emergence process of NTBFs, aiming to address such research gaps. We use a mixed-method approach (Venkatesh et al., 2013) to combine both exploratory and confirmatory questions. We gather empirical evidences through a set of cases that guide theoretically-grounded hypotheses. Then, these hypotheses are tested using a longitudinal panel of NTBFs.
The article is structured as follows: first, we cover the initial theoretical background; then we describe the overall research design and the initial exploratory work. Next, we review and extend the initial theoretical framework. Finally, we describe the research design and hypotheses test using a longitudinal dataset. The overall results are discussed, identifying implications for theory and practice of technology entrepreneurship.

2 Theoretical background

Technology entrepreneurship is used to describe a specific type of entrepreneurship that starts upon new science and engineering developments (Beckman et al., 2012; Giones and Brem, 2017). In most cases of technology entrepreneurship, the individual founders or in their team there is a specialised technical background and skills (Clarysse et al., 2011a). But, to be successful, technology entrepreneurship requires innovation capacity (Brem and Borchardt, 2014) to activate mechanisms that create and capture value (Bailetti, 2012) introducing novel products and services (Beckman et al., 2012; Clarysse et al., 2011a), while managing a growing organisation (Gilbert et al., 2006).

2.1 Resources and time in technology entrepreneurship

The question on whether new ventures require specific resources in their development stages is not a new one (Kazanjian, 1988). But how the resources contribute to their development in different moments of their evolution is (Fisher et al., 2016). In particular, it remains unclear how acquiring resources in the early-stage versus accumulating them as the firm grows affects the new venture development (Bhawe et al., 2016). Regardless of the acquisition order and given the characteristics of NTBFs, we could expect that at least three types of resources should have an effect on its development: the experience of the entrepreneur, their technological assets, and their market knowledge.

Entrepreneurs are often endowed with limited resources; as a result their knowledge and skills are sometimes their only resources. This constitutes the entrepreneur’s human capital (Davidsson and Honig, 2003), and it has been observed to have a significant effect on entrepreneurship success (Rauch and Rijndijk, 2013; Roppelt and Tegtmeier, 2018). Prior studies showed that exposure to situations related to the exploration and exploitation of opportunities result in vital learning for the new firm (Politis, 2005). Less clear is the contribution of different types of experiences, for instance whether generic work experience or specific entrepreneurial experience makes a difference in such situations, in particular if the context is changing as it happens in technology entrepreneurship.

In a similar manner, technological resources could be available at the start of the new venture or be developed as the venture grows. Prior research has studied how patents can be dual source of advantage, providing direct technological knowledge, but also signalling the technological competences of a new firm (Hsu and Ziedonis, 2013). But, we also know that in technology markets, it becomes rather complex for new entrants to make use and make visible their technological resources, thus reducing their expected positive effect (Godley, 2013).

Finally, it has been described that NTBFs’ “main problem is not so much invention but commercialization” (Gans and Stern, 2003), suggesting the expected value of their
market knowledge and related resources. The marketing literature suggests that accumulating resources related to brand development of relationships with customers should reduce consumer uncertainty and favour the activation of first transactions (Erdem and Swait, 1998; Mudambi et al., 1997). Building early marketing assets has been identified to have a positive effect on the introduction and commercialisation of new products (Ramaswami et al., 2008).

Finally, a resource that could be particularly valuable for technology entrepreneurs is to have the necessary time to develop their technology and market. As a result of their complex challenges, technology entrepreneurship results in a slower development process (Clarysse et al., 2011b). NTBFs might take longer than other new firms to be able to validate their market, described by practitioners as the struggle to unlock the ‘product-market fit’ (Maurya, 2012).

As a result, the slower and uncertain development path (McMullen and Shepherd, 2006) makes it difficult to assess the success of a new venture using traditional performance metrics such as revenues or employees hired. As technology entrepreneurs explore different options and paths for their technology and potential markets, a more granular performance construct is needed. Thus, we propose that to study the linkage between resources and performance in NTBFs, we need to adjust the outcome variable of the process. Scholars have suggested to introduce the construct ‘venture emergence’ as an outcome measure that can reflect the different evolutionary paths of new ventures (Tornikoski and Newbert, 2007). The venture emergence perspective is particularly suitable to capture the progression of the new tech-based firm (Dimov, 2010).

2.2 Introducing the venture emergence perspective

Venture emergence aims to capture how organisations come to exist (Katz and Gartner, 1988). Katz and Gartner (1988) describe the four different aspects that describe an emerging organisation: intention, resources, boundary, and exchange. ‘Intention’ suggests that there is an individual actor with the goal to create a new organisation. ‘Resources’ captures whether there are human, financial or other endowments that build and support the activities of the organisation (Brush et al., 2008). ‘Boundary’ portrays whether the organisation has done transactions to build its physical and legal boundaries. Finally, the ‘exchange’ aspect illustrates the activation of market transactions; this means that the emerging organisation transformed inputs into valuable outputs.

As a result, these four elements can be used as measures on the emergence state of a new venture (Brush et al., 2008). For instance, the first commercial transaction, or hiring the first employee become indicators of a further emerged new venture, and can be described as ‘emergence events’ (Dimov, 2010; Tornikoski and Newbert, 2007). Furthermore, such granular perspective of the evolution and performance of a new venture allows to look beyond conventional performance metrics such as sales or number of employees (Clarysse et al., 2011b).

We are left with two different types of questions, the first regarding what resources do actually play a role in the specific context of NTBFs; the second, on whether having access to these resources in the early-stages makes a different for the further development, emergence, of the NTBF.

Therefore, this study explores to what resources play a role in the early stages of technology entrepreneurship and to what extent they impact in the venture emergence process?
3 Research design: a mixed-method approach

To answer the research question, we introduce a mixed-method approach following a two-step research structure (Cameron, 2011). First, a qualitative inductive study to explore what resources play a role in tech entrepreneurship, and then a quantitative deductive study to assess to what extent they contribute to the venture emergence process. With such approach we can, within the research limitations, identify and validate theoretical insights (Molina-Azorin, 2010).

We adopt a developmental approximation (Venkatesh et al., 2013, p.6), described as: “questions for one strand emerge from the inferences of a previous one, or one strand provides hypotheses to be tested in the next one.”

4 Exploring the role of resources in technology entrepreneurship

The first part, the qualitative inquiry, follows the grounded theory method guidelines (Glaser, 2002; Glaser and Strauss, 1967). We did regular iterations between the data collected and entrepreneurship literature, identifying the key themes in relation to our research question (Wagner et al., 2010). The saturation point on new themes was reached after interviewing 21 entrepreneurs (see Table 1) between 2009 and 2011.

Table 1 List of the sampled ventures of technology entrepreneurs

<table>
<thead>
<tr>
<th>Nascent venture name</th>
<th>Industry</th>
<th>Entrepreneur profile</th>
</tr>
</thead>
<tbody>
<tr>
<td>P01-electronix</td>
<td>Electronics</td>
<td>Novice</td>
</tr>
<tr>
<td>P02-usability</td>
<td>Internet</td>
<td>Novice</td>
</tr>
<tr>
<td>P03-HHRR Software</td>
<td>Software</td>
<td>Novice</td>
</tr>
<tr>
<td>P04-medical coding</td>
<td>IT services</td>
<td>Novice</td>
</tr>
<tr>
<td>P05-innovation services 1</td>
<td>IT services</td>
<td>Experienced</td>
</tr>
<tr>
<td>P06-venturing</td>
<td>IT services</td>
<td>Novice</td>
</tr>
<tr>
<td>P07-eRecovery</td>
<td>eHealth</td>
<td>Novice</td>
</tr>
<tr>
<td>P08-TDTBox</td>
<td>Digital TV</td>
<td>Experienced</td>
</tr>
<tr>
<td>P09-waterPower</td>
<td>Renewable energy</td>
<td>Novice</td>
</tr>
<tr>
<td>P10-ChinaTravel</td>
<td>eTravel</td>
<td>Novice</td>
</tr>
<tr>
<td>P11-laserpower</td>
<td>Optic devices</td>
<td>Novice</td>
</tr>
<tr>
<td>P12-Contegia</td>
<td>IT services</td>
<td>Novice</td>
</tr>
<tr>
<td>P13-security systems</td>
<td>IT services</td>
<td>Novice</td>
</tr>
<tr>
<td>P15-creativity</td>
<td>IT services</td>
<td>Novice</td>
</tr>
<tr>
<td>P16-outsourcing</td>
<td>IT services</td>
<td>Novice</td>
</tr>
<tr>
<td>P17-innovation services 2</td>
<td>IT services</td>
<td>Novice</td>
</tr>
<tr>
<td>P18-electroComputer</td>
<td>Electronics</td>
<td>Experienced</td>
</tr>
<tr>
<td>P19-data secure</td>
<td>Software</td>
<td>Novice</td>
</tr>
<tr>
<td>P20-ebusiness</td>
<td>IT services</td>
<td>Experienced</td>
</tr>
<tr>
<td>P21-digitalDevices</td>
<td>IT services</td>
<td>Novice</td>
</tr>
</tbody>
</table>
The sample of technology entrepreneurs was selected from early-stage (between 0–3 years since founding) ventures in innovation parks and incubators in Barcelona, Spain. They were all developing new technologies and had a global market ambition, capturing the profile of global emerging NTBFs as described by Tanev (2012). The interviews length was between 45 to 80 minutes, it was complemented with secondary information on each venture (investor’s presentations or press releases). Part of the data collected was also used for a research project on signalling strategies in IT start-ups (see Giones and Miralles, 2015). The interviews were recorded, transcribed, and coded. The codes were checked and validated with the help of another researcher. The first cases analysed were used to map out codes and emerging themes, this was used as a reference for the following cases.

4.1 Identification of themes on the role of resources in technology entrepreneurship

The coding process resulted in the identification of themes that captures the role that resources would play in the early-stages of the NTBFs. An illustrative example of the quotes that supported the themes can be seen in Table 2. In this first round, aspects like the experience of the entrepreneur and the technological capacities and characteristics of the new venture where particularly prevalent.

<table>
<thead>
<tr>
<th>Themes</th>
<th>Quotes</th>
<th>Venture name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prior entrepreneurial experience influences decision-making and technology opportunity identification</td>
<td>“If I hadn’t had experience in this industry, I wouldn’t have (created) this company”</td>
<td>P19-dataSecure</td>
</tr>
<tr>
<td>Technology intensity of the product/service introduces market uncertainty</td>
<td>“Our product is highly technological, it needs a lot of time to actually become a marketable product”</td>
<td>P01-electonix</td>
</tr>
<tr>
<td></td>
<td>“You are reaching the end of a phase, so that particular uncertainty disappears, but new ones come in. When you are reaching the horizon, there is a new horizon further ahead”</td>
<td>P11-laserPower</td>
</tr>
<tr>
<td></td>
<td>“We still haven’t found it (value proposition) yet, different customers see it in different ways, so we want to spend time in that”</td>
<td>P18-electroComputer</td>
</tr>
<tr>
<td>Technology intensity also impacts on the resource access and management</td>
<td>“It is very difficult to talk in technical terms to investors”</td>
<td>P01-electonix</td>
</tr>
<tr>
<td></td>
<td>“It is very difficult to put some things in the business plan, for example if the business depends on this or not...the inputs you receive shape a new path too frequently”</td>
<td>P14-creativity</td>
</tr>
</tbody>
</table>

In addition, a second round of analysis was done to classify the resources into existing concepts in the entrepreneurship literature. As a result of this process of refinement, the
first themes regarding entrepreneur’s experience and technology, where enriched with other concepts such as social capital or market resources (see Table 3).

Table 3 Illustrative quotes on the types of resources and roles

<table>
<thead>
<tr>
<th>Additional resources and roles</th>
<th>Entrepreneurial venture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social capital: pilot experiments with endorsers, networking “(the institutional endorsement) worked as a public certification that we had the technological and financial resources to complete our technological development”</td>
<td>P08-TDTBox</td>
</tr>
<tr>
<td>Technology: patenting “(technological resources as) elements that help the market to discern you from the others”</td>
<td></td>
</tr>
<tr>
<td>Social capital: endorsements from investors (VC) “Investors evaluate their decision based on whether there is (already) another investor with good reputation (that has already invested) in the company”</td>
<td>P01-electonix</td>
</tr>
<tr>
<td>Technology: patenting and other actions to give visibility to R&amp;D activity.</td>
<td></td>
</tr>
<tr>
<td>Market: brand development and beta customer actions</td>
<td>P13-security systems</td>
</tr>
<tr>
<td>Social capital: networking</td>
<td></td>
</tr>
<tr>
<td>Technology: visible updating of technology resources and their development. “(regarding technology development) for the venture to survive we needed to achieve clear goals”</td>
<td></td>
</tr>
</tbody>
</table>

The results of the first part are the identification of entrepreneur’s experience and network (human and social capital), their technological resources, and their market assets (brand related aspects) as the resources that could play a role in the venture emergence of the NTBF.

5 Hypotheses development

Building on the results from the qualitative exploration, we strengthen these insights to develop hypotheses to be validated in the second part of the mixed-method application.

5.1 Entrepreneur’s experience and knowledge as new venture’s human capital

A very dominant theme in the first part of the research was the importance of the entrepreneur’s experience. This insight is well captured in the human capital literature, but not necessarily in the context of NTBFs (Dimov, 2010; West and Noel, 2009).

In general, we would expect that having work experience should render an advantage in challenging situations. Work experience can also bring a broader network of valuable contacts and potential references (social capital), that could be quite valuable in the context of entrepreneurship (Carolis et al., 2009). So, even in the dynamic context of NTBFs, we propose that the effect should be positive. Therefore, we suggest that:

H1a Founder’s work experience has a positive influence on the new technology-based venture emergence.

A different dimension of human capital is being an ‘experienced entrepreneur’ (Hsu, 2007). The exposure to situations that include activities related to opportunity recognition
and exploitation could change your prior knowledge and entrepreneurial behaviour (Miralles et al., 2017; Politis, 2005; Widding, 2005). Experienced entrepreneurs are observed to follow different decision-making processes (Dew et al., 2009; Schmidt and Heidenreich, 2018). They are expected to be ready to cope with the liabilities of newness (Stinchcombe, 2002), a particularly useful quality in a technological context with uncertainty (Read et al., 2009). Therefore, we suggest that:

**H1b** Founder’s entrepreneurial experience has a positive influence on the new technology-based venture emergence.

Finally, some of the entrepreneurs in the sample suggested that they had learned from prior entrepreneurial experience in the same industry (even if they had failed). We expect to see similar effects to the observation of Colombo and Grilli (2005) on the positive influence of industry-specific work experience in high-tech firms’ context, even if in our case it is in newly created ventures. Therefore, we suggest the following:

**H1c** Founder’s combined entrepreneurial and industry experience has a positive influence on the new technology-based venture emergence.

### 5.2 Technological resources influence on the venture emergence

The qualitative insights suggested the key role that the technology plays in the venture emergence process. The possibility to have protected technological resources (such as patents) and have a strong technological capacity were observed as strong themes in the initial analysis. Therefore, we extend both concepts: technology outputs (as visible factors, such as patents), and technology capacity inputs (as technology intensity or orientation) as suggested by Hsu and Ziedonis (2013). It would be possible that some firms have low levels of visible technology outputs (low number of patents) but sustain a strong R&D intensity supports the development of non-patented innovations. But given the prior insights, we expect that technological resources (such as patents) will positively influence on the venture emergence. Therefore, we propose that:

**H2** The stronger the technology resources of the NTBF the more likely a higher level of venture emergence.

### 5.3 Market factors and venture emergence

Finally, the initial results also supported the idea that besides internal resources, the NTBFs do also benefit from owning market-related assets. Such resources make possible to accelerate the commercialisation of new products and services. staying tuned with market demands renders a better performance (Becker et al., 2015; Ramaswami et al., 2008). Therefore, NTBFs that have market-related assets and capacities (for example a brand, or can execute a marketing campaign), are more likely to advance in their venture emergence. As a result, we hypothesise that:

**H3** The stronger the market resources, the more likely a higher level of venture emergence.
6 Hypothesis test

The second part of the mixed-method focuses on testing the hypotheses that have been derived of the qualitative insights. Next, we present the methods, data and results of this test.

6.1 Method and data

To test the hypotheses, we selected to work with a larger sample of NTBFs. We use data from 447 firms from the Kauffman firm survey (KFS). The KFS is a longitudinal survey of new businesses in the USA sponsored by the Ewing Marion Kauffman Foundation. The KFS panel study contains data from 4,982 business started in 2004 that were surveyed annually till 2011 (see Coleman and Robb, 2009; Robb, 2012). We only used technology-based firms and followed them through their early-stage (0–3 years – between 2004–2007). They are identified as technology-based firms as they operate in industries that are either ‘technology employers’ or ‘technology generators’ (Coleman and Robb, 2009). This includes: information technologies, tech equipment manufacturing, and chemical, among others. It offers a plausible fit with the initial sample of industries captured in the exploratory analysis.

6.1.1 Dependent variable: venture emergence

We use a multidimensional scale to assess venture emergence, it is an adaptation of the scale used by Tornikoski (2007) and Tornikoski and Newbert (2007). The variable can change its value across time (Lichtenstein, 2015). We use four indicators: does the NTBF have sales? (yes = 1 or no = 0), does the NTBF have employees? (yes = 1 or no = 0), has the NTBF received external funding? (yes = 1 or no = 0), does the NTBF have profits? (yes = 1 or no = 0). For each year measurement the sum of the different indicators generates a status level from 0 to 4. Those that achieve higher values (3 or 4) can be considered firms that have high levels of venture emergence and that are fully operative organisations.

6.1.2 Independent variables

The human capital is measured with three variables, overall work experience (years of work experience) consistent with Colombo and Grilli (2005), entrepreneurial experience (number of businesses started) consistent with Dimov’s (2010) measure, and entrepreneurial experience in the same industry (started a business in the same industry) that is a binary measure (yes/no).

Technology resources is measured using patents, the number of patents are a proxy for technology knowledge (Lin et al., 2006), an indicator of the intentions to exploit an innovation and its value (Hsu and Ziedonis, 2013). Technology capacity is measured using R&D intensity (Lin et al., 2006). We use the percentage of employees in the function of R&D (Caloghirou et al., 2004). For both factors, we calculated the average value of each firm across the period of observation (2004–2007) to smoothen the potential oscillations in the first-year measures.

We measure market factors using the number of trademarks, trademarks capture the decision of the managers (the entrepreneur/s) to establish a position in the market
(Mendonça et al., 2004); trademarks also indicate the marketing capabilities of the firm (Mendonça et al., 2004). We measure the market capacity using the percentage of employees in the sales, marketing and general administration functions. This measure has been used as an indicator of the commercialisation intention (Lin et al., 2006). For both variables, we calculated the average value for each firm across the period of observation (2004–2007).

### 6.1.3 Control variables

We have controlled for the number of years that the firm manage to survive including the year coefficients in the model (see later in Table 5). This is in line with the recommendation on using panel datasets for entrepreneurship research and controlling for the unexpected time-effects (Delmar and Johnson, 2015). Although all firms start the same year, we have introduced a firm size measure (number of employees) to be able to control for differences in firms’ size.

### 6.2 Data analysis and results

The descriptive statistics of the variables (see Table 4) includes the mean, standard deviation (SD) and the correlations between the dependent and the independent variables.

<table>
<thead>
<tr>
<th>Table 4</th>
<th>Descriptive statistics and correlations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
</tr>
<tr>
<td>1 Venture emergence</td>
<td>2.71</td>
</tr>
<tr>
<td>2 Work experience</td>
<td>15.45</td>
</tr>
<tr>
<td>3 Entrep. experience</td>
<td>1.28</td>
</tr>
<tr>
<td>4 Entrep. experience (in industry)</td>
<td>0.49</td>
</tr>
<tr>
<td>5 Patents (avg)</td>
<td>0.68</td>
</tr>
<tr>
<td>6 % R&amp;D employees (avg)</td>
<td>0.35</td>
</tr>
<tr>
<td>7 Trademarks (avg)</td>
<td>1.79</td>
</tr>
<tr>
<td>8 % Market employees (avg)</td>
<td>0.47</td>
</tr>
<tr>
<td>9 Employees</td>
<td>4.63</td>
</tr>
</tbody>
</table>

In order to test the hypotheses we used an ordinal logit model (Wooldridge, 2002), as the dependent variable, venture emergence, is codified as status levels (0–4) of the new venture. The nature of the hypotheses and variables used, suggests to adopt a random effects model specification (André et al., 2013; Schunck, 2013). The McFadden pseudo-$R^2$ as a measure for the variance explained (Hoetker, 2007), is used to compare contributions and effects of the previous partial models (see Table 5). The introduction of technology and market factors’ hypotheses enriched the first model with only human capital (model 1).
Table 5
Results from the ordinal estimation of the hypothesised effects on the venture emergence

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coef.</td>
<td>S.E.</td>
<td>Coef.</td>
<td>S.E.</td>
</tr>
<tr>
<td>Work experience</td>
<td>-.00</td>
<td>.00</td>
<td>-.00</td>
<td>.00</td>
</tr>
<tr>
<td>Entrep. experience</td>
<td>-.09***</td>
<td>.08</td>
<td>-.08***</td>
<td>.03</td>
</tr>
<tr>
<td>Entrep. exp. (same industry)</td>
<td>.31***</td>
<td>.04</td>
<td>.35***</td>
<td>.09</td>
</tr>
<tr>
<td>Patents (avg)</td>
<td>-.04**</td>
<td>.02</td>
<td>-.05**</td>
<td>.02</td>
</tr>
<tr>
<td>% R&amp;D employees (avg)</td>
<td>-.70***</td>
<td>.14</td>
<td>-.67***</td>
<td>.14</td>
</tr>
<tr>
<td>Trademarks (avg)</td>
<td>-</td>
<td></td>
<td>-0.10**</td>
<td>.05</td>
</tr>
<tr>
<td>% market employees (avg)</td>
<td>1.4***</td>
<td>.02</td>
<td>1.3***</td>
<td>.02</td>
</tr>
<tr>
<td>Firm size (avg log)</td>
<td>2005 .78***</td>
<td>.10</td>
<td>2006 1.07***</td>
<td>.11</td>
</tr>
<tr>
<td></td>
<td>-</td>
<td></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>/cut 1</td>
<td>-3.34</td>
<td>.16</td>
<td>-3.63</td>
<td>.18</td>
</tr>
<tr>
<td>/cut 2</td>
<td>-1.82</td>
<td>.12</td>
<td>-2.16</td>
<td>.15</td>
</tr>
<tr>
<td>/cut 3</td>
<td>-2.9</td>
<td>.11</td>
<td>-5.8</td>
<td>.14</td>
</tr>
<tr>
<td>/cut 4</td>
<td>1.76</td>
<td>.12</td>
<td>1.50</td>
<td>.14</td>
</tr>
<tr>
<td>Log likelihood (LL)</td>
<td>-3,217.86</td>
<td>-3,082.69</td>
<td>-3,071.54</td>
<td>-3,057.50</td>
</tr>
<tr>
<td>LR chi²/Wald chi² =</td>
<td>154.02</td>
<td>189.04</td>
<td>211.33</td>
<td>239.41</td>
</tr>
<tr>
<td>Prob &gt; chi² =</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>n</td>
<td>400</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(Pseudo) R²  | 0.02 | 0.03 | 0.03 | 0.04 |

Note: *p < 0.1, **p < 0.05, ***p < 0.01.
Regarding the influence of human capital (H1a, H1b, H1c), we see that although work experience (H1a) has no significant effect, entrepreneurial experience does. The number of prior startups run by the entrepreneur (H1b) has a negative weak significant effect (−0.09, p < 0.01) in the complete model (see model 4 in Table 5). Prior start-up experience in the same industry (H1c) has a much stronger and positive effect (0.41, p < 0.01) on the venture emergence. Results suggest that not all types of human capital have the same effect.

The technology factors (H2) hypothesis shows that technology assets (patents) and capacity (% of R&D employees) have negative effects. Weak for the patents (−0.03, p < 0.01), but stronger for the technological capacity measure (−0.67, p < 0.01).

The hypothesis on the market-based resources (H3) offers mixed results. While market assets (trademarks) show a weak but negative influence (−0.04, p < 0.05), the market capacity (% employees in market related functions) shows a positive and significant effect (0.13, p < 0.01).

As part of the results of the complete model, we confirm that the year controls are a strong predictor of venture emergence as it would be expected, firm survival and venture emergence are related.

7 Discussions

Building a NTBFs is often a complex and challenging endeavour (Clarysse et al., 2011b), we introduce the venture emergence perspective to gain further insights on how different resources play a role in this process, and to what extent they make a difference in the emergence of the new venture. Our qualitative and quantitative analysis support the idea that venture emergence is a complex and uncertain process (Lichtenstein et al., 2007) but also bring some additional evidence to prior research on the contribution of different types of resources.

7.1 The entrepreneurs experience as driver of venture emergence

Moving beyond the generic idea that human capital is important for new ventures (Shrader and Siegel, 2007), we observed that:

1 not all types of work experience generate the skills and abilities needed for the technology entrepreneurship process, years of work experience do not seem to have an impact per se

2 entrepreneurial experience is valuable if it is in the same industry; suggesting that for venture emergence it is not enough to have prior entrepreneurial experience, it needs to be in that specific high-technology market.

7.2 The impact of technology resources

In the qualitative part we observed that technology-related assets did not always impact directly on the market performance. In the quantitative study we observed that technological resources, such as patents, were not reliable predictors of NTBF’s venture emergence. Instead, we observed that firms with higher number of patents showed lower levels of venture emergence (in the period of observation). The results also showed that
there are firms that manage to stay active (survive) despite having low levels of venture emergence; this might be the case of firms that stay focused on developing their technological resources or that struggle to generate revenues for longer periods than the three years we monitored.

7.3 The value of market-based resources

In our qualitative inquiry, we found that marketing or market-orientation capabilities help to mitigate uncertainty of first-time buyers. This is in line with much of the research on marketing and entrepreneurship (Lam and Harker, 2015). Suggesting the value of such type of activities and capacities. The quantitative findings did not support the impact of market assets such as trademarks but suggest that there is a significant impact of increasing the resources allocated to market functions in the new venture.

8 Implications and limitations

This research uses a mixed-method design to explore the resources that play a role in the venture emergence of NTBFs, and to what extent such resources make a difference in this process. It contributes to establish the boundaries of the resource perspective on dynamic and uncertain context such as new firms operating in high-technology industries.

The findings have implications for researchers interested in understanding better the contribution of human capital, technology and marketing theory in technology entrepreneurship. First, the results suggest that human capital is more multidimensional than expected, not all experiences contribute the same way to the knowledge and network that the entrepreneur can use to grow its new venture, closely related entrepreneurial experience is observed to have an additional effect that general work experience. Such findings contribute to support calls for more in-depth research on human capital components and development (Roppelt and Tegtmeier, 2018; Unger et al., 2011). A limitation in this work is that we could not measure changes in the human capital, and could not account for the learning process of the entrepreneur (Nogueira and Alsos, 2017), neither of the entrepreneurial team (Muñoz-Bullon et al., 2015), further research should take this into account.

Second, we contribute to explore the boundaries of internal resources centric views on new ventures (Priem et al., 2017), reinforcing the idea that there is a need for further research on how market-based assets and activities contribute to NTBFs. This is in line with the calls to further bridge entrepreneurship and marketing theory (Webb et al., 2010). Our data had limited details on specific marketing activities or the use of brands by the technology entrepreneurs, this could be a relevant area to explore in further research to clarify how and when does market orientation contribute in the emergence of new high tech firms (Mu and Di Benedetto, 2011).

Finally, this study also contributes to extending a more complex view of entrepreneurship (Lichtenstein, 2015). Technology entrepreneurship might require for additional time, and often entrepreneurs in this context will suffer setbacks that require them to pivot and rethink their strategy (Hsu et al., 2017; Wood et al., 2018). Perspectives like the operationalisation of performance through venture emergence indicators are more likely to capture such evolutionary dynamics. A limitation in this study is that we could
not take into account the market entry strategy of the new tech-based firms; researchers could use technology commercialisation frameworks (Gans et al., 2018) to explore how different strategies and resources combinations result in different emergence paths for the new ventures.

This research also has valuable insights for policy makers and other stakeholders engaged in the development of new tech firms. The resources of NTBFs might have an influence on their development, but based on our results, much less strong than it could be expected. Therefore, there are still many opportunities for supporting actors (incubators or accelerators) and stakeholders (investors, institutions, industrial partners) to contribute to the success of the new firm. Contrary to resource centric views, starting with a strong technological resource position does not mean you are bound for glory, it could even be a curse if such resources are not aligned and managed to build a market position for the new firm.

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References


Bound for glory or cursed for life?


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