TAKING THE FIRST HURDLE IN NEW FIRM FORMATION. THE EFFECTS OF INDUSTRY-SPECIFIC SKILLS AND SUPPORT ON SURVIVAL DURING THE FOUNDING PROCESS

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Abstract

Successful firms are important elements of sound economic development. In order to understand the factors that influence firm success many studies have addressed this issue. Success factors in the nascent phase of firm formation are however still unclear. Even as early as in the founding stage, however, firms are discontinued and the processes in this phase hold important information about success factors. This study addresses the founding success of several founding types, including spin-outs and spin-offs. It finds that industry-specific experience of the founders is a crucial success factor. Direct support from a parent firm does however not always enhance survival. Independence rather than support appears to be important for starting a successful firm.

1. Introduction

"The numerically dominant group of small businesses are those which are small today and, even if they survive, are always likely to remain small-scale operations" (Storey, 1994, p. 112). *"We know that many start-ups only persist for a short time. Within five years, about half of all initiatives suffer a quiet death. Of the initiatives which do survive, few offer a substantial number of jobs"* (Schutjens and

Wever, 2000, p. 135-136). These statements leave little room for debate; exit is immanent for many new firms. And some firms meet this fate rather quickly. A fair share of all founding attempts do not even make it to the end of the founding process (Van Gelderen et al., 2003; Aldrich, 1999). The obstacles and problems faced in the founding process prove insurmountable.

Although the survival of firms has been studied quite intensively (see, for example, Nielsen, 2001; Shane, 2005; Eriksson and Kuhn, 2004), research has focussed on survival after entry. Little is known about the factors influencing pre-entry survival or, in other words, the successful completion of the founding process. Still, pre-entry survival is an evenly important aspect of assessing new firm formation processes. The economic trial-and-error process of testing new products and production processes starts in the founding period of new firms and not necessarily after a firm has been officially launched. Unsuccessful product ideas can be disbanded even before the founding process has been completed. By focussing on post-entry survival of (registered) firms, research is limited to those foundings that make it into the official business registers. As a consequence, the group of unsuccessful business attempts remains unaddressed, limiting the research focus to a successful subgroup of all founding attempts (Delmar and Shane, 2004). This could lead to a biased view on firm survival, particularly if pre-entry survival is governed by different factors than survival after start-up. By assessing pre-entry survival our understanding of the success factors of new firm formation can be furthered. This is relevant not only for research purposes. Also venture capitalists, banks and policy makers need insight in the very early stages of founding in order to make informed decisions about target groups. This study adds to this body of knowledge by assessing the pre-entry survival of spin-off firms as compared to other founding types.

Spin-off foundings are generally understood to be successful founding efforts (Garvin, 1983). This has, however, not been extensively tested for the founding period. The success of spin-offs can be explained in terms of their superior access to resources and knowledge (idem; Klepper, 2001). Because

of industry experience, spin-off entrepreneurs develop a knowledge advantage over other founders, explaining success. In addition, spin-offs can sometimes rely on knowledge, capital or other facilities of a parent firm. In line with this, this study takes the access to knowledge and resources during the founding process as its starting point. The access to knowledge and resources is normally measured by using background variables of the founder, most importantly industry experience (see, for example, Klepper, 2001). This, however, is only an approximation. Founders can also gather relevant knowledge working outside an industry. Although there is a relationship between background and relevant knowledge creation, it is theoretically more appropriate to focus on the relevant knowledge itself (Koster & Van Wissen, 2006). It is not the background in a relevant firm that explains performance differences; it is the knowledge of the founders involved. This article contributes by directly measuring the use of previously gained knowledge in employment, rather than relying on background variables that are assumed to indicate the positive effect of experience. In doing so, it offers an operationalisation that links more closely to the theoretical ideas that explain the enhanced performance of spin-off firms.

The remainder of the article is organised as follows. Section 2 develops a framework for studying pre-entry survival of foundings. The framework is based on the role of knowledge and resource access and it draws on existing work about learning, the availability of resources and founding success. Section 3 introduces the PSED (Panel Study of Entrepreneurial Dynamics) dataset which is the basis of the empirical analysis. The comprehensive PSED dataset allows for an empirical analysis that uses the available resources and skills directly. Section 4 discusses measurements issues in the models tested. Section 5, then, presents the empirical models and the results. Finally, Section 6 concludes.

2. Entrepreneurial intentions, founding process and outcome

The founding process of new firms is the period in which entrepreneurial intentions of the founder(s) are being realised (Learned, 1992). In this period, resources are gathered and organised in such a way

that a new firm can start production. The founding process is completed when resources are in place and the new firm is ready for operation. In the founding process, entrepreneurs take sequential steps aimed at completing this process (Gartner, 1985; Bhave, 1994). Following this relatively straightforward founding model, the success of the founding process can be said to be a function of the nature of the entrepreneurial intentions, the quality of the resources that entrepreneurs are able to gather and the skills of the founder to efficiently organise the process (Learned, 1992). Indeed existing studies corroborate this simple model. Delmar and Shane (2004), as well as Lichtenstein et al. (2007), show that the sequential timing of start-up events, such as writing business proposals and hiring employees, is important for reaching the goal of establishing a new business. This stresses the role of organizing the founding process effectively. The role of resource availability is indicated by Chrisman (1999) who asserts that the availability of outsiders knowledge positively affects founding success. In more general terms it can be argued that the value and viability of a founding will be determined by the quality of the resources available. *"The value of any economic organisation (firm, business, company) derives from and reflects the value to it of the resources under its control…"* (Lewin and Phelan, 2000, p.61). Firms that do not have the proper resources will be inefficient and perform suboptimal or even disappear altogether. Finally, Shane (2005) shows that the nature of entrepreneurial intentions importantly influences the outcome of the founding period.

The framework proposed by Learned (1992) focuses on the founder and not so much on the characteristics of the founding. This reflects the idea that, initially, firms are not much more than the founders involved (Stam, 2003). The quality of the founding period can therefore be related to the knowledge and skills available to the founder or founding group. Not only the knowledge and skills directly pertinent to the day-to-day business content are important, also the ability of the founder to gather additional resources for production is important. It is not just the stock of resources available, but also the access to additional resources that determine the outcome of the founding period. In order

to assess the skills and resources available to the founders, many studies rely on measures of human capital. In this line of thought industry experience, working career characteristics, age, formal education and knowing entrepreneurial role models have been shown to positively influence the performance of new firms (Storey, 1994; Nielsen, 2001; Schutjens and Wever, 2000; Dahl and Reichstein, 2005). In a similar vein, group efforts have been shown to have higher survival possibilities because they have a more differentiated knowledge pool for building the firm (Colombo and Grilli, 2003).

Studies on spin-off performance fit into this general body of work that stresses the access to resources and the role of human capital. Spin-offs have a competitive edge over other founders because spin-offs have an intrinsic link to an existing company, the parent firm. Spin-offs can tap into the knowledge pools of the parent firms and this can help in the set-up of the firm. There are two ways in which resources can be transferred to the spin-off firm: 'transfer of internalised specific experience' and 'direct support'.

The transfer of internalised specific experience is a feature of labour market dynamics. While employed, employees pick up knowledge about the business in which they are working. In a sense, they are educated by the employing firm. In some cases, founders appropriate these specific experiences by setting up a new firm (Garvin, 1983; Moßig, 2001). The experiences are internalised in the founder and because the employee is leaving to start a new firm, experiences are transferred from a parent firm to a founding. Most spin-off definitions emphasize the transfer of internalised human capital through job mobility (Garvin, 1983; Klepper, 2001; Agarwal et al., 2004; Feldmann, 2002). Following Agarwal et al. (2004), this founding type is called spin-out in this study. A number of spin-off definitions, however, also suggest a second mode of knowledge transfer: intentional support by a parent firm (Bernardt et al., 2002; Tübke, 2004; Lindholm, 1994). In these cases, founders not only

benefit from previous experiences, they also receive support from their previous employer. The term spin-off is reserved for these types of founding.

Both the indirect transfer of knowledge through internalised experiences of the founder and direct support of a parent firm influence the three aspects of the firm formation process: entrepreneurial intentions, the quality of the resources available and the organisation of the founding process. In the following sections, the influences of internalised experiences and direct support on the three aspects of the founding process are further explored.

Indirect transfer of knowledge and founding success

Starting a firm begins with entrepreneurial intentions (Bhave, 1994; Learned, 1992; Katz and Gartner, 1988). Experience of the founders, gained in employment, can inform these intentions. There are two sides to this argument. Firstly, the recognition of business ideas has been shown to be path dependent with the employment career of entrepreneurs (Shane, 2000; Eckhardt and Shane, 2003). Software developers are more likely to identify business opportunities in software than entrepreneurs with no experience in that field. In addition, taking part in professional networks enhances chances of identifying new combinations (Sorenson and Audia, 2000). Secondly, industry experience gives the opportunity to better assess the potential value of an idea. Industry experience assures a better assessment of the viability of the plan. In terms of the learning-while-doing model of Jovanovic (1982), experienced entrepreneurs have an information lead over inexperienced entrepreneurs from outside the industry. This gives the entrepreneurs a greater chance of operating within the margins of profitability. It can be said that internalised experience raises the chance of finding an opportunity and, more importantly in the present context, it gives the entrepreneur a good basis to assess the viability of the plan. Relevant experience is expected to have a positive influence on the quality of the entrepreneurial intentions.

In the second and third step towards founding, founders gather and organise resources in order to meet the intentions set as closely as possible. In this step, the quality and availability of resources as well as the organisation of the founding process itself determine the outcome of the founding process (Gartner, 1985; Learned, 1992). Addressing this issue, Brüderl et al. (1992) regard the influence of an employment career on the human capital of entrepreneurs. They contend that entrepreneurs build up both industry-specific and entrepreneur-specific human capital. Industry-specific human capital involves an understanding of the relevant characteristics of a particular industry. In a study of Dutch entrepreneurs, knowledge related to the production process was mentioned as the most important effect of industry experience (Koster, 2006). Still, other aspects are important as well. Experienced entrepreneurs can, for example, rely on the professional network they have built (Sorenson, 2004). The focus of Brüderl et al. on industry-specific human capital aligns with the most common spin-off definition that also foregrounds industry-experience. At the same time however, it is clear that there is not an automatic link between industry-specific knowledge and industry experience. Industry-specific human capital can also be gained from outside an industry. For innovation, for example, user knowledge has been shown to be relevant (Boschma and Weterings, 2004; Shah and Tripsas, 2004). Coming from another industry, user entrepreneurs can accurately indicate the flaws of existing products and the needs of the market. As former consumers, user entrepreneurs can identify niches new firms can try to fill. Skills based on learning-by-using can therefore be extremely useful inputs for new firms (Mole and Elliot, 1987). Likewise, specialised divisions can provide industry knowledge that lies beyond the sector of the company as a whole. In contrast, founders coming from the same industry do not necessarily use relevant knowledge in the set-up of their firms. These examples indicate that it is more appropriate to focus on the actual built-up human capital than on the background of a founder as a proxy of the availability of specific human capital.

Apart from industry-specific experience, Brüderl et al. (1992) distinguish entrepreneur-specific human capital. This type is related to prior spells of self-employment or management tasks as employee in which an entrepreneur gathered knowledge about administrative duties and management, organization, and entrepreneurship. In other words, entrepreneur-specific human capital influences the organizational capital of the new firm. Experience as a manager or as an entrepreneur gives a founder skills to manage the founding process and the resulting business. An example of the impact of management on performance is described by Appold (2001). He shows that the management of available knowledge and skills directly influences the motivation and satisfaction of employees. Continuous mismanagement can lead to a situation in which employees do not function well and eventually leave the firm. This will compromise availability and quality of the resources for production. Entrepreneur-specific human capital is not a part of the spin-off definition. Still, it can play an important role in the founding period of firms. Therefore, it has to be taken into account when assessing the founding period of firms.

In conclusion, internalised human capital, based on specific experience, elevates the chances of coming up with a viable business idea. In addition, experience increases the access to and quality of resources used in the founding process. For the organizational part of the founding period, previous functions, manager or entrepreneurship experience, seem to be more important than the specific industry experience of founders. In other words, entrepreneur-specific human capital is not a distinct feature of spin-out firms. Taking this together, Hypothesis 1 can be formulated:

Hypothesis 1: Foundings based on industry-specific human capital (spin-outs) have a higher propensity of completing the founding process than other foundings.

Direct support

The second mode of resources transfer to a founding is direct support by a parent firm. Sometimes existing firms directly help enhance the resource base of a new firm by granting capital, knowledge, guaranteed turnover or other facilities, such as paid time to start the new business. Unlike internalised experiences, the overall effect of direct support is ambiguous.

One positive aspect is the safety-net function of a parent firm. The founding can partly rely on the resources received from the parent firm. As such, it gives the supported founding a somewhat wider margin of error. If the founding process is troubled by setbacks, there is the parent firm to fall back on. This is the positive effect of a somewhat wider resources base. However, there are negative aspects too. Firstly, the quality of the support given is dependent on the quality of the parent firm. Klepper and Thompson (2005) have shown that spin-off firms only outperform other foundings if they originate from a thriving firm. The path dependence involved in the process may induce the replication of less efficient resources. Secondly, the efficient use of resources is not guaranteed. Resources derive their effective use from their intrinsic quality, but also from the way in which they align with the organization in which they are being used (Barney, 1991). As a result, the efficient use of resources depends on the absorptive capacity of firms. For the transfer of internalised human capital, this is not a great problem, because both entrepreneurial intentions and the actual knowledge input for the founding process are based on the experiences of the entrepreneur. In other words, they are congruent. This makes foundings efficient receptors of internalised experiences (Cohen and Levinthal, 1990). However, in the case of direct support, entrepreneurial intentions do not necessarily line up with the resources provided by the parent firm. Thirdly, there may be a selection problem. Support is often given in those cases in which entrepreneurship is not an intrinsic wish of the founder, but a reaction to external factors (Koster, 2006). It can, for example, be the outcome of a negotiation process started by the parent firm in order to lay-off an employee. The firm's support carries the entrepreneurs over the decision

threshold to start a new firm, but during the founding process the entrepreneur could prove to be less suitable for entrepreneurship. Finally and in line with the previous argument, direct support may be somewhat at odds with the nature of entrepreneurial action. Entrepreneurship is often rooted in ideas of self-realisation and independence (Bais, 1999; Van Uxem and Bais, 1996). Entrepreneurs do value the support given by their previous employer, but eventually they could value independence even more. The influence of the parent firm can easily turn into a burden for entrepreneurs that strive for independence.

Thus, the overall effect of direct support remains unclear. In line with the ideas of resource-dependence, in which the access to resources is positively connected to performance, the positive hypothesis is tested.

Hypothesis 2: Foundings that receive direct support (Supported foundings) have a higher propensity of completing the founding process than other foundings.

Foundings can combine both internalised experiences and direct support. Following Bernardt et al. (2002), this type of founding is referred to as spin-offs here. The combined effect is expected to positively influence start-up performance.

Hypothesis 3: Foundings that combine internalised experience and direct support (spin-offs) have a higher propensity of completing the founding process than other foundings.

3. Dataset and measurement issues

The empirical data used in this analysis comes from the Panel Study of Entrepreneurial Dynamics (PSED) dataset, organised by the Entrepreneurial Research Consortium (ERC). The ERC is an association of leading research institutes with a common interest in entrepreneurship. The consortium has its basis in the U.S.A. and most of its research efforts are concentrated here as well. Recently, the PSED methodology and survey have been adopted in other countries (see, for example, Van Gelderen

et al., 2003 for Dutch case). One of the major accomplishments of the ERC is the vast PSED dataset that offers comprehensive information on nascent entrepreneurs; it addresses backgrounds, goals, expectations, resources and success of nascent entrepreneurs. The combined efforts of the participating universities and research institutes have resulted in a large and longitudinal panel dataset, which is unprecedented. The dataset is freely accessible through the internet.[1]

The goal of the PSED dataset is to identify entrepreneurs that are in the process of setting up a firm and to follow them over time. A research population of 830 nascent entrepreneurs was identified in a screener survey. In order to qualify as nascent entrepreneur, three conditions had to be met. First, the respondent expects to own at least part of the new business. Second, there have been activities aimed at starting the business in the past 12 months. This condition guarantees dormant founding efforts to be left out. Third, the firm is not an infant firm, but is still in the founding phase. The last condition relates to the cash-flow of the firm. A firm with a cash-flow that covers expenses and the owner-manager salaries for at least three months is considered infant and the firm was consequently dropped from the population. After the selection process, the founding efforts of the nascent entrepreneurs were followed in four questionnaire waves (from 1998 to 2003). For the purpose of this study, only the respondents who participated in each of the four waves were selected (N=249). Because of missing values in some of the independent variables, the number of observations drops to 182 in the multivariate analysis (Section 5).

The research population of nascent entrepreneurs is not a random selection. Women and ethnic minority groups are over-represented in order to address specific research questions of the project's participants. In order to correct for this bias in the dataset, each analysis has been based on weighted versions of the case values. For a comprehensive account of the selection process and other

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[1] http://projects.isr.umich.edu/psed/

particularities of the dataset, the accompanying dataset description by Reynolds (2000) should be consulted.

4. Variables

The PSED dataset offers the possibility to operationalize the main concepts used to assess pre-entry survival: industry-specific human capital, entrepreneurship-specific human capital, support by a parent firm and additional relevant background variables. These elements are tested in four empirical models. Before turning to the results and technicalities of the empirical model, the variables included are introduced.

Dependent variable

The dependent variable in the empirical analyses is the founding success of firms. This can be regarded as a special case of survival, which is a common indicator of firm success (see, for example, Nielson, 2001). Survival is a somewhat problematic measure of performance because a discontinued firm is not automatically a failure (Headd, 2003; Carroll and Hannan, 1999). Profitable firms are often sold to third parties for good money. These firms are discontinued, but hardly failures. Pre-entry survival or founding success arguably links more directly to firm success, because actually starting a firm can be expected a common goal to all founding attempts. Van Gelderen (2003, p.1) puts it as follows: *"The first success of a firm is its birth."* Measuring founding success involves a different problem, however. In the case of founding success, the main difficulty is to identify demarcation points that can be used to indicate when the founding process has been completed. Several demarcation points can be used to pinpoint the conclusion of the founding phase: the first sale, hiring staff, registration at the Chambers of Commerce and purchasing equipment. None of these variables, however, apply to all firms in the same way. Founding processes are erratic and the founding phases are not necessarily followed in one set order (e.g. business idea, resource collection, registration, production, and sale). In order to avoid these

problems, in this study the founding phase is assumed to end when the entrepreneur indicates it has. This fits most closely the theoretical framework used in which a founding process is seen as the process of realising entrepreneurial intention. The founder can give the best answer as to whether the pre-set intentions have been sufficiently realised.

Obviously, this method also has limitations. Entrepreneurs may be too positive about the founding processes and they can consider the founding processes completed, while other measures may lead to a different conclusion. Nevertheless, this method circumvents possible chronological pitfalls when using events as indicators of progress in the founding process. There is also a practical reason. The question is used to track down the status of foundings throughout the PSED dataset. Therefore, adopting the entrepreneurs' view on the status of the process makes comparison across the waves possible. Thus, the dependent variable used in all models is the dummy variable whether the founding effort was completed successfully in at least one of the four waves.

Independent variables – experience and support

The main variables in the analysis are the internalised knowledge and the direct support given by parent firms. The transfer of internalised knowledge through job mobility (*specific knowledge*) is represented by two variables that address the entrepreneur's experience. The two variables indicate whether a new firm has been based on a business idea that is derived from the industry experience or the specific technological knowledge of the entrepreneurs involved[2]. Industry experience and technological knowledge related to the initiation of the business idea strongly hint at the basis of entrepreneurial intentions. Moreover, both variables have an implicit link to the product of the new firm, which is arguably the most important aspect of specific experience (Koster, 2006). As argued before, by addressing the actual knowledge transfer head on, problems associated with the use of industry

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[2] A positive score on one of the variables makes the founder experienced

background as a proxy for relevant experiences are circumvented. The useful exploitation of the experience itself is important, not the background of the founder.

Direct support from a parent firm to a new firm (*support*) is, unfortunately, not conceptualised in the PSED dataset. The dataset does not contain comprehensive information on the nature of support from other firms. However, there is information on the legal relationship between parent company and the new firm. One variable indicates whether a parent company has an ownership share in the new firm, a second variable identifies whether a firm is started as a part of an employee's job assignment. Direct resource transfer is assumed when a parent company is involved in one of both ways. This conceptualisation has the obvious set-back that there is no proof of actual resource transfer from a parent company to the new firm. However, it seems plausible that the new firm will receive assistance of the firm that is involved, either as the initiator or as future participant. The nature of the support remains unclear though. A second point for consideration is the possibility that the source firm of the indirect resource transfer is not the same firm that provides the support. A new firm can therefore be based on the industry experience gained in one firm and the support provided by another firm. This means that a spin-off can have two parents firms. As a result, the spin-off definition is not followed to the letter. However, the theoretical relationship between resource inputs and performance are adequately conceptualised with this method. The focus on resources, rather than on the background of the entrepreneurs makes it possible to relax the spin-off definition slightly without compromising the theoretical issues at stake.

In the operationalisation used here, specific knowledge is focussed mainly on aspects of production. However, there are dimensions to specific knowledge not directly related to production (networking, for example). Unfortunately, these additional elements of specific experience as such are not present in the dataset, but the industry experience of solo entrepreneurs is. Learning effects that are not included in the product-related specific experience variable are captured by this variable (*solo:*

industry experience). This variable is comparable to the conventional way of defining spin-off efforts as being started by founders with industry experience.

Independent variables – additional human capital and background variables

The definitions of spin-offs and spin-outs emphasize the role of specialised knowledge regarding the production process. However, also other types of human capital are important in the founding of new firms. In order to single out the effect the specialised knowledge gained in previous employment, these types need to be controlled for.

These other dimensions of human capital are captured by several indicators of experience. Organizational experience is understood in terms of management and entrepreneurship experience. This reflects the entrepreneur-specific human capital as distinguished by Brüderl et al (1992). These factors are particularly relevant in the foundation process of new firms, because the entrepreneur picks up knowledge related to the organisation of businesses. The number of years employed in a management function (*ln years employed as administrator*) and coming from self-employment (*self-employed*) measure this effect. For solo entrepreneurs, any assistance in other founding efforts is also included (*solo: helped other founding*). More general human capital is captured by the age and educational attainment of the entrepreneurs (*lnage* and *education*). All variables are expected to positively influence the successful conclusion of the founding process.

The final part of the models consists of variables that refer to the structure of the founding and the assets available to it. Firstly, group efforts (*Founding team*) are generally understood to have higher chances of success (see for example Colombo and Grilli, 2003). In a group founding, the chances of complementing skills are greater which makes it easier to manage all sides of the foundation process successfully (Lazear, 2003). Secondly, having a job while starting up could have an effect as well (*hybrid founding*). On then one hand, it can provide the entrepreneur with an easy access to resources. On the other hand, it can indicate a lack of commitment to the foundation process. A lack of time or

commitment has been shown to negatively affect performance (Van Uxem and Bais, 1996). Thirdly, the financial position of the entrepreneurs is important (*Income*). Setbacks in the founding process are easier to overcome if the financial position of the entrepreneur is good.

5. Results

The hypotheses predict positive relationships between, on the one hand, specific experience and support and, on the other hand, founding success. Before turning to a multivariate analysis of these expected relationships, the founding success of experienced founders and supported founders are compared to other foundings as an explorative step in the analysis of the data.

Descriptive analysis

Using the actual resource transfer it is possible to define spin-outs (based on specific knowledge), supported foundings (receiving support) and spin-off firms (combining specific knowledge and support). On the basis of these operationalisations, 21% of the firms (N=249) can be classified as supported foundings, whereas 66% are based on specific knowledge derived from experience in the industry or with the technology at hand (spin-outs). This is in line with previous research that suggests most founders to have a background in the same industry (Garvin, 1983). Relevant knowledge input is suggested as the underlying principle and the above result adds to this idea. Direct support is more rare, but still one in five independent foundings are strongly related to an existing firm. Finally, a smaller group of 14% combines specific experience with support. This is the spin-off group. This share is comparable to existing spin-off research that also uses direct support as defining variable (Dahl and Reichstein, 2005).

Figure 1 takes the three groups as a basis and it depicts the cumulative founding success rates of each founding group. At t=0 none of the firms have reached the 'operating business' state yet, because

the set-up of the dataset requires them to be so-called 'active start-ups'. After one year (t=1), over 40% of all foundings have successfully completed the founding period[3]. Experienced founders and supported founders perform somewhat better than the average founder, confirming the expected positive effect of support and specific knowledge. A combination of both types of input, as manifest in spin-offs, seems to offer the greatest benefits.

Figure 1: Founding success.
The share of foundings that successfully conclude the founding period by type of founding. Based on own calculations from PSED dataset.
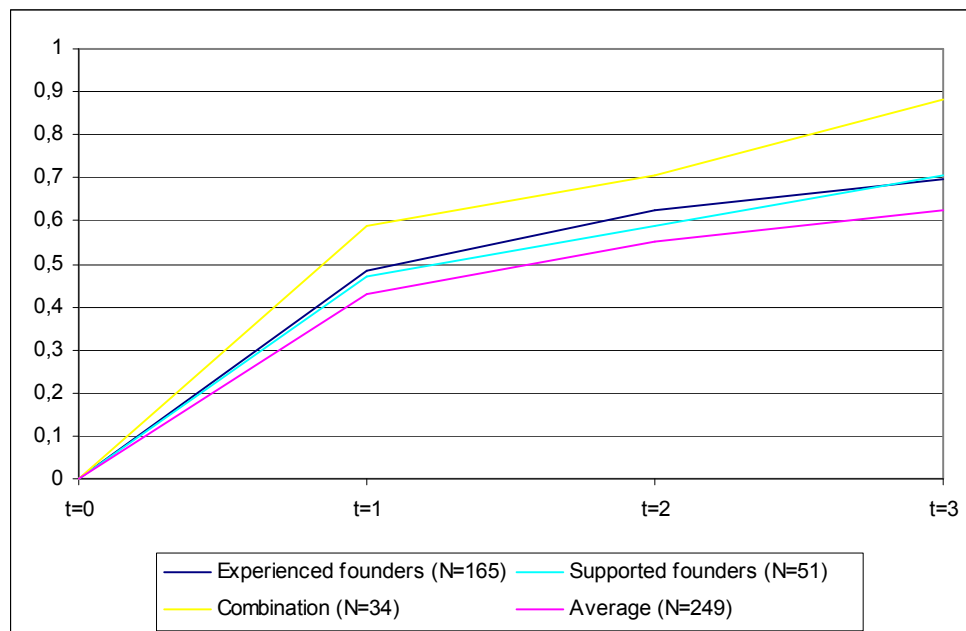
After the first year (t=2 and t=3), overall success rates drop, reflected by the declining slope of the cumulative founding success share. The chances of reaching the end of the founding process drop over time. A thorough pre-entry process is usually considered a positive feature, because it is related with better post-entry performance (Van Gelderen, 1999). A serious and capable entrepreneur needs some time to organize a founding successfully. Within the founding process itself, time seems to be an

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[3] The same statistic for all respondents, rather than only loyal respondents, is 33%. This suggests that there is an upward bias in the loyal respondents group. This will be corrected for in the multivariate analysis. The differences between the groups are nevertheless comparable to the whole group of foundings.

enemy rather than a friend. The longer a founding process takes, the slimmer chances of ending the process become. A study using the Dutch version of the PSED dataset shows the same trend (Van Gelderen et al., 2003). The results are in line with the hypothesis that with the passing of time between initiation and full functioning, it is increasingly difficult to adjust the founding process to all changes in the environment (Hannan and Freeman, 1989). The entrepreneur has to act upon the environmental conditions as quickly as possible. The decline is less marked for supported foundings and spin-offs, hinting at the safety net function of support. Even when the founding process proves to be complicated, the support of a parent firm ensures a successful conclusion.

Multivariate analysis

The descriptive analysis suggests that support and specific experience do improve the propensity of completing the founding period, giving support to the hypotheses. In the multivariate analysis this is further explored. The influence of specific experience on the completion of the founding process is tested in four binary logistic regression models with the dummy variable *founding success* as dependent variable. Models A and B use all eligible founding efforts by loyal respondents in the dataset. In Models C and D, group foundings have been filtered out because two variables were added that only apply to solo-entrepreneurs (*solo: industry experience* and *solo: helped other founding*). Because the analysis is based on respondents that have participated in all research waves, there is a possibility of bias. The loyal respondents may be a particularly successful subset of all entrepreneurs. This could lead to spurious results. The models include Heckman lambda correction terms in order to mitigate the problem of selection bias (Heckman and Sedlacek, 1985). Table 1 presents the results of the regression analyses.

Table 1: Multivariate estimates of founding success for all foundings (A and B) and solo entrepreneurs (C and D).

	Model A	Model B	Model C	Model D
Human Capital:				
Ln age entrepreneur	0.22 (0.45)	0.21 (0.46)	-0.49 (0.70)	-0.57 (0.74)
Education (nominal):				
(Low)	-0.81 (0.75)	-0.78 (0.75)	-0.90 (1.14)	-1.00 (1.20)
(Middle)	-1.06 (0.68)†	-1.02 (0.68)†	-1.65 (1.00)*	-1.91 (1.08) *
(High) (ref)	--	--	--	--
Ln years employed as administrator	-0.02 (0.03)	-0.23 (0.03)	0.00 (0.05)	0.00 (0.05)
Self-employed (d)	1.53 (0.42)**	1.72 (0.44)**	1.31 (0.75)*	1.54 (0.81) *
Solo: helped other founding (d)			-0.30 (0.64)	-0.91 (0.76)
Specific experience / support:				
Specific knowledge (d)	0.95 (0.38)**	0.42 (0.42)	1.36 (0.78)*	0.76 (0.85)
Support (d)	0.05 (0.44)	-1.55 (0.75)**	-0.65 (0.74)	-3.82 (1.69) *
Support x specific knowledge		0.89 (1.05)**		5.12 (2.09) **
Solo: Industry experience (d)			1.61 (0.91)*	1.26 (1.00)
Background and assets:				
Income:				
(Low)	-0.72 (1.32)	-1.03 (1.40)	-2.52 (2.24)	-4.53 (2.62) *
(Middle)	0.43 (0.65)	0.47 (0.67)	0.39 (1.26)	-0.19 (0.76)
(High) (ref)	--	--	--	--
Hybrid founding (d)	-0.21 (0.45)	-0.29 (0.47)	-1.81 (0.84)*	-2.51 (1.00) **
Founding team (d)	0.70 (0.40)*	0.73 (0.41)*		
Gender (d, male = 1)	0.45 (0.38)	0.12 (0.40)	0.39 (0.61)	0.58 (0.66)
Heckman's Lambda	-1.79 (0.89)*	-1.37 (0.93)	-1.56 (1.40)	-0.44 (1.53)
Intercept	-1.96 (5.24)	-1.81 (5.30)	5.85 (8.00)	8.12 (8.58)
Nagelkerke R^2	0.31	0.36	0.50	0.57
-2 loglikelihood 0-model	240.93	240.93	123.37	123.37
-2 loglikelihood	194.11	185.59	81.47	73.19
N	182	182	95	95

binary logistic regression, dep. variable – founding success (1= founding process successfully completed), (d) – dummy variable, (ref) – reference group, SE-values in parentheses.
† - significant at 10% level (one-sided confidence intervals), * - 5% level, ** - 1% level

The results are discussed in order of presentation in Table 1, starting with Models A and B. These models include all loyal entrepreneurs. Overall, general human capital indicators have a small positive effect on founding success. Age does not play a role, and also administrative or supervisory experience has no significant influence. Previous self-employment experience does increase the chances of successful self-employment later. This result is in accordance with literature on habitual

entrepreneurship which regards entrepreneurship as a trial-and-error process with a higher chance of success after previous founding attempts (Alsos and Kolvereid, 1998). The entrepreneur can use organizational knowledge from previous attempts in the founding of a new firm. Education shows an unexpected pattern. Higher education leads to better founding chances compared to medium levels of education. This is in line with expectations, as higher education can represent larger human capital. They can use this in the founding process. However, contrary to this argument, there is no statistically significant difference between the highly educated and those entrepreneurs with the lowest level of education. Perhaps this group consists of entrepreneurs without many options apart from self-employment. The chances of finding a job as an employee with limited education are lower, forcing the entrepreneurs to finish the founding process.

The specific knowledge and support indicators show interesting results. In Model A, building a founding on specific knowledge has a positive effect on successfully completing the founding period. Support is not a significant factor. This confirms the idea that product-related experience gives firms a better chance of starting within the margins of profitability, either because of a superior product idea, or superior production methods and resources. Even as soon as in the founding period these effects become visible. In Model B, the interaction effect between both variables is included. This represents the additional effect of combining support with specific experience. Now, the individual effects of experience and support diminish and the combination of support and product-specific knowledge dominates the other variables. Specific knowledge still has a positive relationship with success, but not at a significant level. Support is found to now contribute negatively to founding success, which contradicts Hypothesis 2. When reviewing the accumulated impact of the main effects and the interaction effect, the negative effect of support is confirmed (Table 2). Supported firms, when controlling for other variables, perform worse than firms that do not receive support. The negative relationship is somewhat mitigated when support is combined with specific knowledge giving support

to Hypothesis 3, but starting a firm without support appears the most promising road to successfully completing the founding process. Apparently, receiving support does not help a new firm, even in its early stages. Weterings and Koster (2007) draw a similar conclusion with regards to innovation output. Cutting all ties with the parent company may be a prominent success factor for new firms. In order to start a viable business, independence appears to be a crucial factor.

Table 2: Interaction effects Models B and D

		Model B Specific knowledge		Model D Specific knowledge	
		Yes	*No*	*Yes*	*No*
Support	*Yes*	-2.05	-3.36	10.18	4.30
	No	-1.39	-1.81	8.88	8.12

The cells report the sums of the coefficients of the main effects and the interaction effects. This represents the total effect.

The last group of variables, the asset variables, have mixed effects. Group foundings have greater chances of founding success. The combination of the entrepreneurs' individual knowledge and assets provides better potential of success. Further, there may be group pressure not to discontinue the founding process, even when the founding process is plagued with setbacks. Hybrid entrepreneurs have somewhat lower chances than average of finishing the founding process. This confirms the idea that an entrepreneur needs to be fully committed to the task in order to successfully start a new firm. It does not mean, however, that such entrepreneurs are necessarily less suited for the job. Rather, they have the possibility of returning to their previous employment when things go astray in the founding process. In contrast to the entrepreneurs with low educational attainment, they are not forced to continue the founding process as the result of lacking alternatives. Income has no influence on the likelihood of successfully completing the founding process. This is somewhat surprising, because capital could be used to overcome initial setbacks. The variable is, nevertheless, important, as the income variable improves the models considerably in terms of the Nagelkerke R-square score.

Models C and D (Table 1) are based on a subsample consisting of solo entrepreneurs only. The models are similar to Models A and B with one exception concerning the operationalisation of the specific knowledge variables. An additional variable is included which measures the industry experience of the entrepreneurs. This variable can be related to spin-off definitions in studies that conceptualise spin-offs as firms originating from the same industry. The variable captures industry experience which is not captured in the product-related knowledge.

In line with the earlier models, the impact of specific experience is significantly positive. Support is again negatively related to founding success. The accumulated impact of the main effects and the interaction effects is lower for supported foundings than for unsupported foundings (Table 2). In contrast to the case of all foundings (Models A and B) however, solo entrepreneurs do seem to benefit from the combinatory effect of support and specific knowledge. The support of a parent firm may have a comparable positive effect to working in a team. In a team, the skills of various entrepreneurs can be combined and problems can be faced together. For solo entrepreneurs, the extra inputs needed in the founding process may be obtained from the parent firm. Support (in combination with specific knowledge) seems particularly important for solo entrepreneurs.

Models C and D include an additional industry-experience variable. While the founding group definitions cover specific knowledge related to the production process, other industry-specific knowledge types may also be important. The residual skills (not captured by the support and specific-knowledge variables) are represented by the industry experience variable. In Model C, industry experience does contribute to explaining founding success. Apparently, entrepreneurs take knowledge, other than those related to the product, from their previous employer to the new firm. The residual influence of industry experience could involve the recognition of opportunities (Shane, 2000; 2005), and also the social status of the entrepreneur within the sector (Sorenson, 2004; Van Wissen, 2004). An entrepreneur can rely on reputation and an extensive network of contacts to help in effectively

concluding the founding process. In Model D, industry experience has no effect, which underlines the explanatory power of the specific-experience indicators. The additional industry experience variable is rendered obsolete because its effects have been captured in the skill variables. This result strengthens the theoretical argument for focussing on skills rather than on background. Nevertheless, the argument needs further substantiation since the result only appears in one of the regressions.

Turning to the other variables, it is clear that very little has changed compared to the previous models. The Nagelkerke R-square values for the subsample are higher than before, suggesting a good explanation of the variance in the models. The most significant difference is the negative influence of hybrid foundings. For solo entrepreneurs, hybrid foundings have significantly reduced chances of founding success compared with other foundings. In the event of a difficult founding process, the easy way out of going back to employment seems more attractive than in the context of group starts. Group dynamics perhaps force entrepreneurs to continue with a difficult founding process, rather than returning to employment.

In conclusion, the founding success of firms can be explained well on the basis of the input resources. Hypothesis 1 is confirmed: product specific knowledge enhances founding success. Hypothesis 2 is partly confirmed: support can have a positive influence, but only when combined with product knowledge. Support as such does not have a positive influence on founding success. Hypothesis 3 regarding the combination of industry-specific experience and firm support is partly accepted. In comparison to firms without any industry experience or support, the changes on founding success are higher. However, in comparison to firms with only industry-specific experience the picture is unclear. Only for solo entrepreneurs a small positive effects can be noticed.

6. Conclusion

Spin-offs are considered successful founding efforts. The combination of relevant industry-specific knowledge and skills concerning the production process and direct support from a parent company make these firms stand out from the rest. Most of these studies define spin-offs on the basis of the previous employment positions of the entrepreneurs. This method disregards the process of resource transfer that theoretically explains the differences in performance with other foundings. This paper offers an empirical analysis of start-up success based on the actual resource transfer from parent firm to founding.

Spin-off definitions generally distinguish two ways in which resources are transferred from parent firm to founding: transfer of knowledge internalised in the founder and direct support. Both elements are expected to be positively related to founding success. Superior specific experiences give spin-off entrepreneurs better insights in the viability of the business plan and a better access to high-quality resources. Supports offer a safety-net on which the entrepreneurs may rely during the founding process. The results show that the relationships are more complex.

Overall, it seems that specific experience has a positive effect on founding success. Founding success rates are higher than average and also the regression results point out the positive influence of experience. The role of support, however, is not so straightforward. Support as such is not a recipe for pre-entry survival. Support without any product feeling even results in lower founding chances. This adds to the idea that support is not a panacea for all entrepreneurial problems. In combination with experience, the negative influence of support is somewhat mitigated and in the case of solo entrepreneurs, the combination actually results in higher founding success rates. Nevertheless, the expected univocally positive effect of support is not found. This hints at the idea that support may induce less capable entrepreneurs to start a new firm. It could also indicate that the safety net actually works as a retaining suit, limiting the independence of a founding. In any case, the findings show that

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caution is warranted when concerning the relationship between support and the performance of foundings. In order to further understand the role of support in spin-off formation, it seems necessary to further assess the nature of the support given and the arguments why firms would support possible competitors to enter the market. This could further explain the possible negative side effects that support can have on the survival of new firms.

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