Industrial and Corporate Change, 2020, Vol. 29, No. 3, 797–826
doi: 10.1093/icc/dtz076
Advance Access Publication Date: 23 January 2020
Original article

The survival of business takeovers and new venture start-ups

Guoqian Xi,[1] Jörn Block,[2,*] Frank Lasch ,[3] Frank Robert,[4] and Roy Thurik [5]

[1]Shanghai University of Finance and Economics, Shanghai, China. e-mail: xgq.natalie@gmail.com, [2]Faculty of Management, Trier University, Universitaetsring 15a, DM-Gebäude, Postfach 28, Trier 54296, Germany. e-mail: block@uni-trier.de, [3]Montpellier Business School, Montpellier, France. e-mail: f.lasch@montpellier-BS.com, [4]Montpellier Business School, Montpellier, France. e-mail: f.robert@montpellier-BS.com and [5]Rotterdam, The Netherlands. e-mail: thurik@ese.eur.nl

*Main author for correspondence.

Abstract

Business takeovers and new venture start-ups are two important and distinct entry modes of entrepreneurship. They differ from resource-based and organizational ecology perspectives. We compare firm survival patterns and determinants associated with the two entry modes. From two large French datasets, we find that business takeovers have a higher survival rate than new venture start-ups. However, these differences in survival probability reduce over the entrepreneurship life cycle and when controlling for different entrepreneur and firm characteristics. Moreover, we identify differences in determinants of survival for the two groups, highlighting a distinction between the two entrepreneurship entry modes. This work contributes to the literature on the relationship between entrepreneurship entry and firm survival, thereby contributing to both entrepreneurship and firm survival research.

JEL classification: L26, M13

1. Introduction

Acquiring an existing business (business takeover) and creating a new one (new venture start-up) are two distinct and widely used entrepreneurship entry modes (Parker and Van Praag, 2012). The two entry modes differ from resource-based and organizational ecology perspectives. Business takeovers typically involve a larger initial entry size and more available resources and are less hazardous than new venture start-ups as they already involve established infrastructures, resources, and processes as well as existing products and an existing customer base (Parker and Van Praag, 2012; Bastié *et al.*, 2013; Block *et al.*, 2013). New venture start-ups, in turn, do not involve these resources or market legitimacy and suffer from liabilities related to their newness and smaller scale, increasing their risks of organizational mortality (Aldrich and Auster, 1986; Bates, 1990; Brito and Mello, 1995; Geroski, 1995).

Our study offers a first comparison of the survival patterns of business takeovers and new venture start-ups. We seek to answer following three research questions. First, do survival probabilities differ between business takeovers

and new venture start-ups? Second, if they do, how do such differences evolve over the entrepreneurship life cycle[1]? Third, how do individual- and firm-level factors affect the survival rates of business takeovers and new venture start-ups? In other words, how do survival determinants of the individual- and firm-levels differ between business takeovers and new venture start-ups?

To answer these questions, we analyze a large and representative sample of business takeovers and new venture start-ups occurring in France over an observation period of 68 months. With respect to our first research question, we find that business takeovers have higher survival probabilities than new venture start-ups. However, differences in survival probabilities between the two entry modes reduce over the entrepreneurship life cycle. Regarding survival determinants, we find that most factors affect the survival rates of both groups in a similar way. However, some differences exist. For instance, we find that entrepreneurs' small-firm work experience and entrepreneurial motivation influence new venture start-ups' survival chances; however, for takeovers, these factors do not have an effect. Moreover, we find that at firm level, financial capital, received public aid, and initial firm size affect the survival of new ventures and takeovers differently. We conduct several robustness checks. Specifically, we conduct our empirical analysis using different econometric models. Moreover, we replicate our empirical investigation using a similar dataset from the same data provider but collected at a later point in time. The replication confirms our main results regarding the first and second research questions. Again, survival probabilities are higher for business takeovers than for new venture start-ups and differences between the two groups reduce over the entrepreneurship life cycle. However, we could only partially replicate our findings regarding differences in determinants of survival found between the two entry modes.

The examined topic is not merely of academic but also of practical interest. Individuals considering becoming entrepreneurs are interested in knowing more about their respective survival chances as entrepreneurs and the factors that shape them. Our findings contribute to a better understanding of various entrepreneurship entry modes and their survival patterns. Several policy initiatives have promoted business takeovers and new venture start-ups in Europe (e.g., The European Commission Entrepreneurship 2020 Action Plan). Our results show that business takeovers show slightly higher chances of survival in the first years that reduce over the entrepreneurship life cycle when accounting for differences in entrepreneur and firm characteristics. In particular, the latter result confirms policymakers in their efforts to support both types of entrepreneurship. Our results, however, also indicate that survival patterns and drivers of success for both types of entrepreneurship differ to some degree and that policy initiatives must take these differences into account. This is particularly true for the first years after market entry, when survival probabilities are higher for business takeovers than for new venture start-ups.

Our study contributes to firm survival research. We contribute to the discussion on the relationship between entry modes and firm survival (Mata *et al.*, 1995; Helfat and Lieberman, 2002; Klepper, 2002; Mata and Portugal, 2002; Geroski *et al.*, 2010; Frankish *et al.*, 2013). We compare the survival patterns of two entry modes hitherto not analyzed. Our results correspond well with an organizational ecology perspective. New venture start-ups suffer from liabilities of newness, and therefore, initially present lower survival rates than business takeovers. This disadvantage, however, weakens over the entrepreneurship life cycle as new ventures become more experienced and mature. Our article also contributes to research on determinants of entrepreneurship duration and on the survival of new ventures (Brüderl *et al.*, 1992; Mata and Portugal, 1994; Stearns *et al.*, 1995; Santarelli and Vivarelli, 2007; Block and Sandner, 2009) by showing that some but not all determinants have different effects based on the mode of entry into entrepreneurship. In addition to our contributions to the firm survival literature, we contribute to the small but growing literature on differences found between new venture start-ups and business takeovers (Cooper and Dunkelberg, 1986; Parker and Van Praag, 2012; Bastié *et al.*, 2013; Block *et al.*, 2013; Kay and Schlömer-Laufen, 2016; Xi et al., 2018a,b). Our study shows that new venture start-ups and business takeovers not only differ in terms of important entrepreneur and firm characteristics but that these differences also shape firm survival patterns. In line with claims made by Parker and Van Praag (2012) that business takeovers are less uncertain than new venture start-ups, we find that risks of firm mortality are greater for the latter than for the former. To the best of our knowledge, our study is the first to compare business takeovers and new venture start-ups regarding outcome and success measures. Prior research has focused primarily on the antecedents of either mode of entrepreneurship entry.

1 We define entrepreneurship life cycle at the individual level. It refers to the life cycle of an individual being an entrepreneur and encompasses the time span from becoming an entrepreneur (either by starting a new venture or by taking over an existing one) till leaving entrepreneurship (either voluntarily or involuntarily).

The remainder of our study is structured as follows. Section 2 describes firm survival from a resource-based and organizational ecology perspective. Section 3 discusses how new venture start-up and business takeover differs across these two perspectives. Section 4 introduces our data source, sample, variables, and method. Sections 5 and 6 present our results and robustness checks, respectively. Section 7 discusses the results and draws conclusions.

2. Firm survival from resource-based and organizational ecology perspectives

Firm survival can be explained by internal factors such as founders' and employees' human capital, available financial resources, initial entry size, and strategic choices. We refer to this perspective as the resource-based perspective. Firm survival can also be the outcome of a selection process where firm survival is the product of how well an organization adapts to its environment. We refer to this view as the organizational ecology perspective. This perspective views firm survival as a dynamic process and is well suited to explain how survival probabilities change over the firm life cycle. In the following, we briefly summarize the firm survival literature from these two perspectives.

2.1 Firm survival from a resource-based perspective

The resource-based perspective posits that organizations possess heterogeneous resources that are difficult to imitate, thereby distinguishing them from one another in the market (Alvarez and Busenitz, 2001). Firms are thus treated as a composite of resources ranging from physical and measurable assets such as land, machines, financial capital, and employees to intangible assets such as organizational experience, patents, and trademarks. The resource-based view argues that resources are "accumulated through a consistent time pattern of expenditures or flows" (Dierickx and Cool, 1989: 1509). The accumulation of asset stocks in an organization is converted into capabilities, which helps build a competitive advantage (Dierickx and Cool, 1989; Grant, 1991). This process occurs over time and necessitates learning and operating in the market. Older firms typically have an advantage over younger firms in this regard. Another related aspect concerns the initial entry size. Industrial organization research shows that the initial entry size can be an important predictor of firm survival and post-entry performance (Mata and Portugal, 1994; Mata *et al.*, 1995; Audretsch *et al.*, 1999; Honjo, 2000; Agarwal and Audretsch, 2001). This firm size effect has been explained among others by economies of scale and by cash constraints associated with small-firm size. The empirical literature, however, points also toward the existence of moderating factors. Agarwal and Audretsch (2001), for example, show that the positive association between firm survival and initial entry size disappears in mature industries where small firms can survive by filling a strategic niche.

In addition to the sheer number of resources, a number of studies point to specific resources or capabilities that influence firm survival. Klepper (2002) finds that pre-entry experiences of founders play an important role. In a similar vein, Dencker *et al.* (2009) and Colombo *et al.* (2004) show that founder's pre-entry knowledge, industry and management experiences, and entrepreneurial experience increase firm survival. Dencker *et al.* (2009) further show that pre-entry experience is an important moderator that facilitates learning activities. Helfat and Lieberman (2002) highlight that it is not only firm resources and capabilities but also the match with industry requirements that ultimately determines firm survival.

2.2 Firm survival from an organizational ecology perspective

Organizational ecology theory (Hannan and Freeman, 1977) offers an alternative view from which to investigate firm survival. According to this theory, firm survival is not the product of internal resources but is rather an outcome of an environmental selection process (Carroll and Delacroix, 1982). Internal factors play a role in how an organization adapts to the external environment, thereby influencing firm survival (Bertoni *et al.*, 2019).

The liability of newness (Stinchcombe, 1965) is a key element of organizational ecology theory and has been linked to organizational mortality (Brüderl and Schussler, 1990). Carroll and Delacroix (1982) find that young firms share higher death rates than older firms in the newspaper industries of Argentina and Ireland; this age dependency on firm survival reduces and even vanishes over firm life cycles. Similar results are given by Brüderl *et al.* (1992) from their study of new ventures founded in Germany. Explanations for this firm life cycle effect are provided by Brito and Mello (1995) and by Honjo (2000) who argue that financial constraints are more pronounced for young firms than for mature firms with an established track record. Mata and Portugal (1994) and Mata *et al.* (1995) examine the survival determinants of existing versus new firms entering new markets and conclude that the initial entry size matters

Table 1. Differences between business takeovers and new venture start-ups

	Business takeover	New venture start-up
Resource-based perspective	Resources and characteristics of the entrepreneur • Management experience (Parker and Van Praag, 2012; Bastié *et al.* 2013) • Small-firm experience (Xi *et al.*, 2018b) • Older (Block *et al.*, 2013)	Resources and characteristics of the entrepreneur • Higher educational attainment (Parker and Van Praag, 2012; Bastié *et al.*, 2013; Block *et al.*, 2013) • Same sector experience (Bastié *et al.*, 2013; Xi et al., 2018b) • More likely to be female (Bastié *et al.*, 2013; Kay and Schlömer-Laufen, 2016) • Relevant entrepreneurial and professional network (Bastié *et al.*, 2013)
	Financial resources of the firm • Higher initial financial capital (Parker and Van Praag, 2012; Bastié *et al.*, 2013) • More likely to receive bank loans (Bastié *et al.*, 2013) • Internal financing through cash flows possible	Financial resources of the firm • Little internal financing possible • Cash and credit constraints
Organizational ecology perspective	Liability of newness is low • Established infrastructures, processes, and systems • Proven business model • Track record with customers and existing customer relationships • Track record with suppliers • Credit history and existing relationships with banks and other finance providers	Liability of newness is high • No track record with suppliers • No credit history with banks • No customers

more for the latter than for the former. New ventures are more vulnerable to selection pressures than existing firms due to a "lack of formal goals, clear boundaries, and unambiguous technologies" (Amburgey and Rao, 1996: 1273). New ventures suffer from liabilities of newness that limit their survival probabilities, forcing them to exit earlier on than existing firms (Geroski, 1995). The initial period of firm formation bears the highest levels of mortality risk, and as firms grow and expand, the risk of exiting reduces. The organizational ecology perspective takes a dynamic view and can effectively explain why survival patterns and probabilities change over the firm life cycle.

3. Differences between business takeovers and new venture start-ups

There are multiple ways to become an entrepreneur (Cooper and Dunkelberg, 1986). A clear distinction can be drawn between the "new venture start-up" and "business takeover" entry modes. The former involves becoming an entrepreneur by starting a new venture whereas the latter involves becoming an entrepreneur by taking over an established business as an individual who is not part of a business owning family. In line with the literature (Parker and Van Praag, 2012; Bastié *et al.*, 2013), we regard family takeovers and management buyouts as separate categories, as they are not accessible to nonfamily members and outside employees. In the following, we briefly discuss how business takeovers and new venture start-ups differ from resource and organizational ecology perspectives. Table 1 shows our main arguments.

3.1 New venture start-ups and business takeovers from a resource-based perspective

How do business takeovers and new venture start-ups differ with regard to the resources and capabilities they possess? A number of studies have dealt with this question and compared the characteristics and different resources of new venture start-ups and business takeovers. Regarding the entrepreneur running the firm, the evidence is mixed. New venture start-ups are preferred by female entrepreneurs (Bastié *et al.*, 2013; Kay and Schlömer-Laufen, 2016), more educated entrepreneurs (Parker and Van Praag, 2012; Bastié *et al.*, 2013; Block *et al.*, 2013), entrepreneurs with more industry and same sector experience (Bastié *et al.*, 2013; Xi *et al.*, 2018b), and entrepreneurs with an

innovation orientation (Block *et al.*, 2013). Business takeovers, in turn, are associated with entrepreneurs with small-firm experience (Xi *et al.*, 2018b), with management experience (Parker and Van Praag, 2012), and who are older (Block *et al.*, 2013).[2] With regard to social capital, Bastié *et al.* (2013) find that entrepreneurs associated with new venture start-ups enjoy strong access to entrepreneurship and professional networks. This is less the case for entrepreneurs associated with business takeovers.

Regarding firm characteristics, the evidence is clearer than with entrepreneur characteristics and favors business takeovers, which typically enjoy better access to financial resources than new venture start-ups. They are more attractive to banks and other providers of financial resources, as their business and revenues are less volatile and as they offer an existing track record of credit history (Parker and Van Praag, 2012; Bastié *et al.*, 2013). Business takeovers also typically involve a larger initial firm size than new venture start-ups. This larger initial entry size is not only attributed to the fact that they enjoy established infrastructures but also to industry effects. Parker and Van Praag (2012) show that entry via new venture start-up relative to takeover is more difficult in industries with greater capital requirements.

To summarize our resource-based view arguments, while some studies (focusing of the entrepreneur as a person) suggest that business takeovers enjoy greater access to resources than new venture start-ups, other studies (focusing of firm characteristics) suggest the opposite. Hence, we expect to find differences in resource access between the two groups. How these resource differences lead to potential differences in survival remain unclear.

3.2 New venture start-ups and business takeovers from an organizational ecology perspective

How do new venture start-ups and business takeovers differ from an organizational ecology perspective? Prior research has emphasized that business takeovers differ from new venture start-ups due to the liability of newness and due to the degree to which they have a track record and are known and legitimated to market participants (Parker and Van Praag, 2012; Block *et al.*, 2013). For business takeovers, a functioning business model with existing products and/or services usually already exists. This is not the case for new venture start-ups, as the entrepreneur by definition starts from scratch. He or she must find a functioning business model and gain legitimacy with market participants. With business takeovers, it is easier for the entrepreneur to gain legitimacy as he or she can build on existing customer and supplier relationships to mitigate his or her liabilities of newness. Thus far, research has only postulated on the lower liability of newness for business takeovers versus new venture start-ups and has not investigated its effects on firm survival and other firm outcomes. Following the predictions from organizational ecology theory and the liability of newness argument, we would expect new venture start-ups to show higher rates of mortality than business takeovers.

But are these differences in mortality and survival constant over the entrepreneurship life cycle? Prior empirical research suggests that this may not be the case. The environment surrounding the firm is not a constant factor. In fact, the environment interacts with the firm and learns from this interaction about the firm and its qualities. In line with this, research by Carroll and Delacroix (1982) shows that survival disadvantages of young versus old firms can disappear over the firm's life cycle.

To summarize our organizational ecology arguments, we posit that new venture start-ups suffer more from liabilities of newness than business takeovers do and hence a survival disadvantage exists. However, this difference is assumed to reduce over the entrepreneurship life cycle (Brüderl and Schussler, 1990; Brüderl *et al.*, 1992).

4. Data and method

4.1 Data source and sample

We analyze the survival patterns of business takeovers and new venture start-ups with a large French dataset. The French entrepreneurship context has experienced a strong increase in the annual number of new firms (216,000 new firms in 2000 vs. 550,000 in 2014). With more than half a million new firms founded each year, entrepreneurial

2 Some evidence from hybrid entrepreneurs is also available (those retaining jobs in wage employment): educational attainment, management experience, and operating in an urban region are associated with new venture start-ups while being a female and/or blue-collar employee and having same sector experience are linked to business takeovers (Xi *et al.*, 2018a).

dynamics are today comparable with those of neighboring countries such as Spain, Italy, Germany, and the UK; however, France is known as a distinctive micro-firm environment in which small and medium-sized firm are underrepresented and in which most firms are born and remain (very) small (Jaouen and Lasch, 2015).

To create our sample, we use the French dataset SINE 2002 (*Système d'Information sur les Nouvelles Entreprises*). SINE 2002 was created and is maintained by the French National Institute of Statistics and Economic Studies (INSEE, *Institut National de la Statistique et des Études Économiques*) and represents a three-wave survey addressed to the entire population of newly founded firms and business takeovers at three points of their lifespan (at start-up and 3 and 5 years thereafter). SINE 2002 is addressed to the entire population of newly founded firms and business takeovers in operation between January and June 2002 (100,731 firms). SINE 2002 is the third cohort of surveys addressed to the new firm population in France (the first one started with firms founded in 1994 and the second started with firms founded in 1998). In September 2002, the INSEE addressed a questionnaire to entrepreneurs/owner-managers and asked respondents to report on themselves and on their firms. Addressed to the same firms founded in the first semester of 2002, two follow-up surveys were sent in September 2005 and September 2007. The INSEE then used the questionnaires to create the publicly available SINE dataset. More specifically, our dataset contains individual-level (e.g., demographics, the human and social capital of the entrepreneur, start-up preparation activities, motivations) as well as firm-level information (e.g., initial organizational settings, resources, financing, markets, firm development) for the entire cohort of firms founded in 2002 and gathered at three moments in time (2002, 2005, 2007). The basis of SINE 2002–2007 is the total population of 100,731 firms newly founded or taken over in the first half of 2002. As the survey was mandatory,[3] the response rate was very high (92,966 out of 100,731 firms). We consider this percentage as a good representation of the new firm and business takeover population in the first half of 2002.

According to the INSEE, a new firm is a new legal entity that has been assigned a new nine-digit registration number while a business takeover occurs when an entrepreneur takes over an outside venture. SINE 2002 covers three types of business takeovers: family firm takeovers, management buyouts, and outside takeovers. From the dataset, we select all new firms, but for the takeovers, we exclude family takeovers and management buyouts because these are unavailable to nonfamily members and outside employees, respectively (Parker and Van Praag, 2012; Bastié *et al.*, 2013). We also exclude individuals who had not worked as employees prior to entering entrepreneurship like formerly self-employed individuals, students, homemakers, and individuals who had previously been unemployed for long periods.[4]

To answer the first and third research questions, we construct a sample of new venture start-ups and business takeovers for a 5-year observation period running from 2002 to 2007 using the following approach. First, observations with missing values are excluded from the sample. Second, we exclude respondents who gave controversial answers. For instance, the questionnaire asks entrepreneurs to report whether their firm is innovative or not, and if yes, choose the type of innovation. We exclude entrepreneurs who declare their firm as non-innovative but later make a choice among the types of innovation. Such controversial observations constitute a minuscule number of individuals for which excluding them shall not affect the representativeness of the final sample. After all exclusions, our final sample consists of 34,872 entrepreneurs (34.6% of the total population of new firms and takeovers in the first half of 2002), among which 3758 (10.8%) had chosen to take over an existing firm while 31,114 (89.2%) had chosen to start a new venture. Regarding the second research question, we create four other samples to observe the

3 As is the case for many other French statistical surveys, SINE is declared by the public authorities as a survey of recognized general interest and is conducted under the auspices of the Ministry of Economics, Finance and Industry (authorization: Visa, n° 2002 X 101EC) and is subject to law n°51-711 (June 7, 1951). Article 7 of this law specifies the mandatory nature of the SINE survey and specifies sanctions imposed with a failure to respond. It also guarantees the anonymity of respondents listed in the final publicly available dataset.

4 We exclude these individuals from the sample in order to better capture the effect of work experience on firm survival. By focusing on former employee sample, we are able to identify and categorize work experience by former employer size (*small-firm experience*, *medium-firm experience*, and *large firm experience*). Moreover, we can address the effect of an individual's sector experience on entrepreneurial survival probability in contrast to those with work experience from different sectors.

survival rates of business takeovers and new venture start-ups measured over 1, 2, 3, and 4 years from 2002. From these five samples, we analyze the survival of business takeovers versus new venture start-ups and the evolution of survival differences observed between the two groups.

4.2 Propensity score matching

Our analysis compares the survival chances and determinants of new venture start-ups to the survival chances and determinants of business takeovers. While our dependent variable *survival months* is a firm-level variable, we investigate as determinants of firm survival both individual- and firm-level variables. Business takeovers account for roughly one-tenth of all firms listed in the respective SINE datasets. As entrepreneurs may not be randomly assigned to new venture start-ups and takeovers, a direct comparison of takeovers and new venture start-ups may yield an estimation bias. For instance, prior studies show that industry experience, management experience and start-up capital play an important role in an individual's entrepreneurship entry mode choice (Parker and Van Praag, 2012; Bastié *et al.*, 2013; Block *et al.*, 2013; Kay and Schlömer-Laufen, 2016). To limit such biases, we apply a propensity score matching approach to construct subsamples of new venture creators that are similar to business acquirers in terms of individual- and firm-level characteristics (Becker and Ichino, 2002; Caliendo and Kopeinig, 2008; see Hölzl, 2013 for a similar approach applied to the field of industrial dynamics). As a robustness check, we also tried one-to-one nearest neighbor matching (without replacement) to create our matched sample. The results were similar.

In Rosenbaum and Rubin's (1983) study, the propensity score is defined as "the conditional probability of assignment to a particular treatment given a vector of observed covariates" (41). The propensity score measures the propensity of observing an event conditional on all relevant factors that may influence the occurrence of that event. In other words, it measures the likelihood of an event occurring (but that never did occur) when taking into account all factors that may impact its appearance. In our case, we consider all factors that may affect an individual's entrepreneurship entry mode choice across new venture start-ups and business takeovers. Drawing on the previous literature on entry mode choice, we conduct a logistic regression using the full SINE sample with the dependent variable equaling one when an entrepreneur engaged in a business takeover and taking a value of zero when he/she created a new venture start-up. From the regression results, propensity scores are predicted. A high propensity score assigned to a new venture creator implies that an entrepreneur was likely to use a takeover as his/her entrepreneurship entry mode but instead created a new firm. As we need new venture creators to be as similar to business acquirers as possible, we select 3758 new venture creators with the highest propensity scores from the SINE sample. We, in turn, obtain two equally sized samples of new venture start-ups and takeovers for further analysis.

4.3 Discrete-time duration model

Firm entry and exit could occur at any time of the year. However, our dataset does not include information on the exact day a firm registers or deregisters from the administration system. It records only the year and the month of firm registration and cessation. As a result, firm survival time is discrete, varying between 1 month and maximum 68 months. Hence, we perform a discrete-time logistic model (Allison, 1982; Jenkins, 1995) to compare the survival probabilities and the survival determinants of new venture start-ups and business takeovers. Discrete-time logistic models differ from a simple logistic model in that the former does not drop the information on firms' survival time and assumes it to be divided into several intervals (Maul, 1994). To perform discrete-time regression, we expand the dataset from respondent level to respondent-month level. That way, the number of observations over a 5-year lifespan increased from 34,872 to 1,813,241. We follow the same procedure to process the samples for 1, 2, 3, and 4 years survival data using dataset SINE 2002.

To further check the robustness of our main findings, we use several alternative estimation techniques. We estimate a (Weibull) model with frailty to control for unobserved heterogeneity across individuals. Moreover, we conduct stratified analysis and a proportional hazards model as robustness checks. Finally, we replicate our main findings using a similar dataset from the same data provider collected at a different point in time. A summary of the robustness check results is shown in Section 6.

4.4 Variables

4.4.1 Dependent variable

Survival months and response variable: Information used to identify "birth" (creation of a new legal entity or acquisition) and "death" (cessation) stem from two original variables provided by the INSEE: (i) the date of creation/acquisition as a code *month_year* and (ii) the date of cessation as a code *month_year*. We define a firm's survival time as the number of months running from its creation or acquisition to its cessation. In our sample, all firms were either founded or acquired from January to June 2002 while cessation periods range from September 2003 to September 2007 on a yearly basis. Accordingly, the survival months of new venture start-ups and takeovers for September 2003 range from 1 to 20 months. Similarly, the maximum number of months of firm survival for September 2004, 2005, 2006, and 2007 are 32, 44, 56, and 68 months, respectively. The data are right-censored, as many firms were still active when the last survey was conducted. Next, to conduct a discrete-time analysis, we code a response variable which equals 0 at month t if the firm is active; 1 if the firm exits at month t.

Unfortunately, due to data security concerns, we are unable to track ownership changes for new venture start-ups and business takeovers for the observation period. We could also not determine whether a firm had exited for liquidation or individual reasons. We stress this as a limitation in the last section of the article and offer insights for future improvement.

4.4.2 Independent variables

Both individual- and firm-level variables are considered in investigating the survival determinants of business takeovers and new venture start-ups. Information on industry sectors and firm locations was drawn from the SIRENE firm register (part of the SINE dataset).[5] All other variables are constructed based on self-reported answers collected from the INSEE questionnaires.

Work experience: An entrepreneur's previous work experience is measured across three dimensions. First, work experience with large versus small firms is assumed to influence firm survival (Stuart and Abetti, 1990; Elfenbein *et al.*, 2010; Sørensen and Phillips, 2011). In our analysis, three categorical variables (*small-*, *medium-*, and *large-firm experience*) are coded to measure an entrepreneur's principal work experience acquired by working with firms with less than 49 employees, with 50–249 employees, and with more than 250 employees, respectively (Klapper and Richmond, 2011). Second, an entrepreneur's management experience is assumed to influence firm survival (Duchesneau and Gartner, 1990; Dyke *et al.*, 1992; Ganotakis, 2012). We code *management experience* with a value of one when an entrepreneur reported being a former CEO or senior manager; otherwise, the dummy variable is equal to zero. Third, an entrepreneur's industry experience is assumed to play a vital role in discovering and exploiting attractive market opportunities and in prolonging survival time (Gimeno *et al.*, 1997; Bosma *et al.*, 2004; Roberts *et al.*, 2011; Boyer and Blazy, 2014). The *same sector experience* variable measures whether an entrepreneur worked in the same business sector prior to his/her move to entrepreneurship.

Educational attainment: The entrepreneur's educational level is assumed to be positively related to a new venture's survival time (Bates, 1990; Boyer and Blazy, 2014). We use four dummy variables to measure an entrepreneur's highest level of education achieved preceding entrepreneurship (*lower than an A-level diploma*, *A-level diploma*, *A-level plus 2 years education*, *A-level plus over 2 years education*). Moreover, an *entrepreneurial training* dummy variable is used to measure whether an individual received entrepreneurial training before he/she entered entrepreneurship.

Entrepreneurial motivation: First, we use *full-time entrepreneurship* to measure an entrepreneur's devotion of time to his or her start-up or business takeover (Folta *et al.*, 2010; Raffiee and Feng, 2014; Schulz *et al.*, 2016). This dummy variable is equal to one when an entrepreneur claims not to be involved in business activities in addition to his/her entrepreneurial projects; it is equal to zero when an entrepreneur is a part-time or hybrid entrepreneur (Folta *et al.*, 2010). Second, *opportunity entrepreneurship* is equal to one when an individual chose entrepreneurship because he/she had a new business idea or discovered a business opportunity; *necessity/mixed entrepreneurship* is the benchmark group referring to individuals whose entrepreneurial motivation involved push factors such as financial

5 Administered by INSEE. SIRENE (*Système informatisé du répertoire national des entreprises et des établissements*) is the official French firm register.

constraints or unemployment. Third, *growth ambition* measures whether an entrepreneur pursues growth for his or her firm, and *long-term orientation* refers to an entrepreneur's long-term plans for his or her firm.

Support for entrepreneurs: As entrepreneurial knowledge and experience can be transferred within a close relational circle, entrepreneurs with self-employed parents are assumed to be more likely to succeed than those without self-employed parents (Duchesneau and Gartner, 1990; Cooper *et al.*, 1994; de Jong and Marsili, 2015). Moreover, entrepreneurs may receive financial support such as social benefits before starting their businesses. Furthermore, single-person firms may face higher mortality risks than firms with multiple founders (Duchesneau and Gartner, 1990; Boyer and Blazy, 2014). We capture these three forms of entrepreneur support by incorporating three dummy variables into the model: *entrepreneurs in close relational circle*, *received social benefit*, and *solo entrepreneurship*.

Sociodemographic status: Using SINE data collected in 1998, Boyer and Blazy (2014) find a positive relationship between new venture survival time and entrepreneur age and a negative association between survival and non-EU citizenship. We include the entrepreneur's *age*, gender (*female*), and nationality (*French*) in the model to analyze an entrepreneur's sociodemographic impacts on firm survival.

Firm characteristics: In drawing from the literature that shows innovative start-ups are riskier than non-innovative start-ups (Boyer and Blazy, 2014), we consider three forms of innovation that may affect firm survival: *product*, *process*, and *organizational innovation*. Moreover, a new firm's financial structure and financial constraints, which are measured by its *start-up capital*, *received public aid*, and *percentage of self-funding*, are taken into account, as these measures are assumed to be success factors for newly created firms (Bates, 1990; Brüderl *et al.*, 1992; Cooper *et al.*, 1994; Stucki, 2014; Liu and Li, 2017). Furthermore, initial firm size is assumed to be an important determinant on firm growth and firm survival (Cooper *et al.*, 1989; Audretsch *et al.*, 1999; Agarwal and Audretsch, 2001). To capture the impact of initial firm size, we add the variable *log number of employees* into the model, which is the logarithm of the number of employees when the firm was founded or taken over. Finally, according to the findings of Headd (2003) and Stam *et al.* (2010), which show that firms in urban areas are less likely to survive, we assume that firm location may be a survival determinant and we use dummy variable *urban* to measure its effect.

Industry factors: We include seven industry dummies in the regressions to capture industry differences: *agricultural food*, *nonagricultural food*, *commerce*, *transportation*, *real estate*, *business service*, and *personal service*.

Table 2 presents the operationalization of our dependent and independent variables.

5. Empirical results

An overview of the full sample of all new venture start-ups and business takeovers is presented in Table 3. Irrespective of entrepreneurship entry modes, 55% of firms of the 2002 cohort were still active in September 2007 with an average survival time (including censored data) of 52 months. From the 5-year lifespans of newer populations, according to the INSEE, 91.1% of new firms founded in 2010 were still active 1 year after forming, and respectively, 71.8% and 60.4% were active 3 and 5 years thereafter.[6] These relatively high survival rates are typical of the French population of new firms and are not only limited to non-innovative industries. For instance, analyzing the information and communication technology sector, Robert *et al.* (2017) find that 85% of new firms survive through the first year while 60% remain alive 3 years thereafter. Moreover, we check the correlations and the variance inflation factors (VIFs) of all independent variables before and after propensity matching is used. All VIFs are below three regardless of whether the matching method is implemented, indicating that multicollinearity is less of a concern.

Table 3 reports *t*-test results that compare the takeover sample to the new venture start-up sample *before* and *after* propensity score matching.

5.1 Univariate comparison and descriptive statistics

5.1.1 Descriptive statistics and univariate comparison of survival probabilities (unmatched samples)

Figure 1 graphs Kaplan–Meier survival estimates for the business takeover sample and for the full sample of new venture start-ups. We observe a higher survival rate for the former than for the latter. A log-rank test also suggests that

6 *Source*: Les entreprises créées en 2010, September 2018, https://www.insee.fr/fr/statistiques/2664148

Table 2. Description of variables

Variables	Description
Dependent variable	
Survival	Number of months between creation/acquisition and cessation
Independent variables	
Type of work experience	
Medium-firm experience, large-firm experience	Prior work experience and firm size. Question 9 in 2002: *Your main professional experience was mainly acquired in a firm with…* (ranges: *small-firm experience:* less than 50 employees; *medium-firm experience:* 50 to 250 employees; *large-firm experience:* over 250 employees).
Management experience	Prior management experience. • Question 5 in 2002: *What was your situation before creation or taking over the firm?* (independent/self-employed, business manager/CEO/shareholder, employee, student, jobless); • Question 6 in 2002*: If you are employee, what is the category of your job?* (senior executive/intellectual profession, supervisor level, intermediary profession, employee, worker). • Combining Q5 and Q6, management experience is defined when the respondent chose business manager/CEO/shareholder or senior executive/intellectual profession.
Same sector experience	Prior industry experience. Question 10 in 2002: *How does the activity of the newly created firm relate to the main profession you have exercised?* (same, different, NA).
Educational attainment	
Lower than A-level diploma, A-level diploma, A-level plus 2 years education, A-level plus over 2 years education	Diploma obtained. Question 4 in 2002: *What is your highest degree?* (ranges: No diploma, lower than A-level diploma, A-level diploma, A-level plus 2 years education, A-level plus over 2 years education).
Received entrepreneurial training	Received entrepreneurship training prior to start-up. Question 21 in 2002: *Have you followed a training to set up your project?* (yes or no).
Entrepreneurial motivation	
Full-time entrepreneurship	Devotion of time to business. Question 14 in 2002: *If you currently work with a main title in another firm and received payment, your status is…* (salaried worker, non-salaried worker, no other activity or secondary profit-making activity).
Opportunity entrepreneurship	Reasons to become an entrepreneur. Question 18 in 2002: *Cite at most 3 reasons for starting the business* (*opportunity:* new idea, discovery of opportunity, independence, entrepreneurial spirit, role models; *necessity:* unemployed; *mixed motivation:* both opportunity and necessity motivations).
Growth ambition	Main objective. Question 16 in 2002: *What is your main objective?* (develop strongly your business in terms of employment and investment, maintain the own employment).
Long-term entrepreneurship	Intended lifespan. Question 15 in 2002: *Are you intending to be a business manager for short or long term?* (short term, more than 5 years).
Support for the entrepreneur	
Entrepreneurs in close relational circle	Role model. Question 12 in 2002: *Do you have self-employed and business managers in your close surrounding (family or not)?* (yes or no).
Received social benefit	Entrepreneur received social aids. Question 8 in 2002: *Did you receive public aids or subsidies?* (yes or no)
Solo entrepreneurship	Starting entrepreneurship on his/her own. Question 19 in 2002: *Did you set up your business …* (alone, with your life-partner, with another family member or close person, with an ex-colleague, with an organization helping entrepreneurs, with member(s) from the company you have taken over)
Sociodemographic status	
Age between 35 and 49, age over 50	Age range of the entrepreneur/owner-manager. Question 1 in 2002 (range: under 35, between 35 and 49, over 50 years)
Female	Question 2 in 2002: *What is your gender?* (male or female)
French	Question 3 in 2002: *What is your nationality?* (French, European Union, other)

(continued)

Table 2. Continued

Variables	Description
Firm characteristics	
Product innovation, process innovation, organizational innovation	• Perceived innovativeness. Question 36 in 2002: *Do you think you are innovative?* (yes or no) • Type of innovation. Question 36 in 2002: *If yes, the innovation relates to…* (new products/concepts/service to the market, new production processes/ methods, implementing a novel organization).
Start-up capital: 16–80k€, start-up capital: >80k€	Amount of initial capital. Question 23 in 2002 (ranges: less than 16k€, between 16k€ and 80k€, more than 80k€).
Received public aid	Financial entrepreneurship support. Question 27 in 2002: *Did you receive public aids or subsidies?* (yes or no).
Percentage of self-funding	Initial personal capital invested. Question 25 in 2002: *What is your share of personal resources, family or shareholders in the global financing of the project* (continuous in %).
Log number of employees	Logarithm of the initial number of employees. Question 42 in 2002: *Fill in the total number of employees at launch time*. (continuous variable)
Urban	Region of implementation[a] (predominantly urban vs. intermediate/predominantly rural)
Industry variables	Eight industry dummies: *agricultural food*, *nonagricultural food*, *commerce*, *transportation*, *real estate*, *business service*, *personal service*, and *other industries*.

Notes: [a]This variable is adapted from the OECD regional typology to the aggregate level of French administrative regions. *Source:* OECD (2011).

business takeovers and new venture start-ups have different survival distributions ($\chi^2 = 30.38$, $P < 0.001$). To further determine whether our analysis is robust, we conduct a *t*-test that compares the survival rates of business takeovers to those of new venture start-ups.

Table 3 shows that the survival time (in months) and survival rate of new venture start-ups differ from those of business takeovers. The mean survival time of business takeovers is four and a half months longer than the mean survival time of new venture start-ups (56.06 vs. 51.51 months); survival rates, however, are only marginally different, with business takeovers presenting a slightly higher probability of survival than new venture start-ups (57% vs. 55%).

T-test results further show significant differences across the two forms of entrepreneurship on several individual- and firm-level variables. Regarding individual attributes, for instance, we find that individuals who create new venture start-ups are more likely to have management experience (28% vs. 19%) and same sector experience (66% vs. 61%) while business acquirers are more likely to be opportunity entrepreneurs (87% vs. 76%) to have growth ambitions (58% vs. 47%) and to pursue long-term entrepreneurship (92% vs. 90%). Regarding firm characteristics, t-tests reveal significant differences between takeovers and new venture start-ups in terms of financial structures. For example, creating a new venture requires less capital than acquiring one (e.g., 75% vs. 22% for those of less than 16k€), and new venture start-ups are more likely than business takeovers to receive public aid (32% vs. 28%) and are more often self-funded (59% vs. 29%). Business takeovers and new venture start-ups also differ in industry sectors. Business takeovers are particularly overrepresented in "agriculture," "commerce," and "personal services" and they are particularly underrepresented in "business services." These differences between the two groups underscore the necessity to create matched samples that limit selection effects.

5.1.2 Descriptive statistics and univariate comparison of survival probabilities (matched samples)

Previous studies have found that an individual's decision to start a new venture or to take over an existing one depends on an individual's previous work experience, sociodemographic status, and financial capabilities (Parker and Van Praag, 2012; Bastié *et al.*, 2013; Block *et al.*, 2013; Rocha *et al.*, 2015; Kay and Schlömer-Laufen, 2016). To account for these differences and potential selection effects, we apply a propensity score matching approach to construct a sample of 3758 new venture start-ups consisting of new venture creators similar to those who engage in business takeovers in terms of work experience, sociodemographic status, and other individual-level characteristics.

We graph Kaplan–Meier survival estimates for business takeovers and for matched new venture start-ups in Figure 2. We find that the curve representing the survival function of new venture start-ups (dashed curve) shifts

Table 3. Characteristics of new venture start-ups versus business takeovers before and after matching (data source: SINE 2002)

	Full sample	Before matching			After matching		
	(mean)	New venture start-up (mean)	Business takeover (mean)	*t*-test of mean differences	New venture start-up (mean)	Business takeover (mean)	*t*-test of mean differences
Survival months	52.00	51.51	56.06	−14.91***	51.98	56.06	−9.18***
Survival rate	0.55	0.55	0.57	−2.39*	0.56	0.57	−0.67
Type of work experience							
Small-firm experience	0.72	0.71	0.79	−11.11***	0.78	0.79	−1.40
Medium-firm experience	0.12	0.12	0.09	6.54***	0.09	0.09	0.61
Large-firm experience	0.16	0.17	0.12	8.11***	0.13	0.12	1.21
Management experience	0.27	0.28	0.19	14.24***	0.22	0.19	3.36***
Same sector experience	0.65	0.66	0.61	5.67***	0.58	0.61	−2.19*
Educational attainment							
No diploma	0.13	0.13	0.14	−1.03	0.13	0.14	−0.85
Lower than A-level diploma	0.37	0.35	0.47	−13.60***	0.45	0.47	−1.85
A-level diploma	0.18	0.18	0.19	−1.42	0.20	0.19	2.01*
A-level plus 2 years education	0.12	0.12	0.10	5.10***	0.11	0.10	1.26
A-level plus over 2 years education	0.20	0.21	0.11	19.01***	0.11	0.11	0.11
Received entrepreneurial training	0.36	0.36	0.36	0.14	0.36	0.36	0.17
Entrepreneurial motivation							
Full-time entrepreneurship	0.83	0.82	0.91	−17.79***	0.86	0.91	−6.26***
Opportunity entrepreneurship	0.77	0.76	0.87	−18.55***	0.84	0.87	−3.60***
Necessity/mixed entrepreneurship	0.23	0.24	0.13	18.55***	0.16	0.13	3.60***
Growth ambition	0.48	0.47	0.58	−12.75***	0.58	0.58	0.00
Long-term entrepreneurship	0.90	0.90	0.92	−4.84***	0.92	0.92	−0.89
Support for the entrepreneur							
Entrepreneurs in close relational circle	0.68	0.68	0.66	2.18*	0.68	0.66	1.45
Received social benefit	0.06	0.07	0.04	6.95***	0.06	0.04	3.55***
Solo entrepreneurship	0.51	0.54	0.33	25.91***	0.37	0.33	3.69***
Sociodemographic status							
Age under 35	0.40	0.40	0.45	−6.26***	0.43	0.45	−1.63
Age between 35 and 49	0.47	0.47	0.47	−0.03	0.48	0.47	0.37
Age over 50	0.13	0.13	0.08	11.34***	0.09	0.08	2.24*
Female	0.23	0.22	0.33	−13.43***	0.36	0.33	2.96**
French	0.89	0.89	0.92	−6.96***	0.92	0.92	−0.13
Firm characteristics							
No innovation	0.58	0.59	0.51	9.34***	0.49	0.51	−1.45
Product innovation	0.22	0.22	0.23	−1.73	0.27	0.23	3.93***
Process innovation	0.08	0.08	0.08	−0.05	0.08	0.08	0.35
Organizational innovation	0.16	0.15	0.24	−13.35***	0.20	0.24	−4.60***
Start-up capital: <16k	0.69	0.75	0.22	72.99***	0.30	0.22	7.15***
Start-up capital: 16-80k	0.22	0.19	0.40	−25.40***	0.46	0.40	5.08***
Start-up capital: >80k	0.09	0.06	0.37	−39.61***	0.24	0.37	−12.35***
Received public aid	0.32	0.32	0.28	5.10***	0.34	0.28	5.96***
Percentage of self-funding	0.55	0.59	0.29	54.89***	0.30	0.29	1.39
Log number of employees	0.36	0.30	0.83	−40.80***	0.65	0.83	−9.88***
Urban	0.64	0.65	0.52	15.39***	0.52	0.52	−0.12
N firms	34,872	31,114	3758		3758	3758	

Notes: Welch's *t*-test is presented.
Significance level: $^{*}P < 0.05$, $^{**}P < 0.01$, $^{***}P < 0.001$.

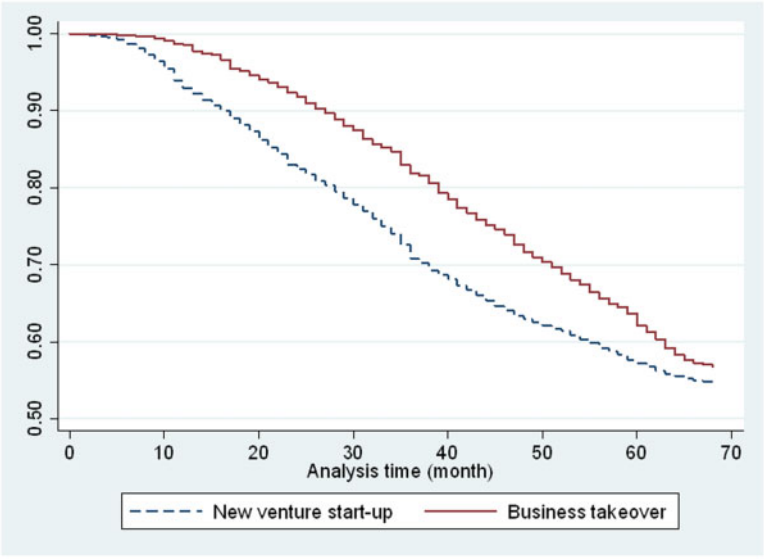

Figure 1. Kaplan–Meier firm survival estimates by entrepreneurship entry modes (before matching, data source: SINE 2002).

upwards, showing that the discrepancy between new venture start-ups and takeovers regarding survival rates narrows after the propensity score matching approach is applied. Nevertheless, a difference remains and particularly in the first months after entry into entrepreneurship.

The last three columns of Table 3 present *t*-test results for the matched new venture start-up and takeover samples. When comparing the survival rates of new venture start-ups before and after matching, we find a slight increase from 55% to 56%; the survival rate of new venture start-ups is no longer significantly different from the survival rate of business takeovers. Differences in the number of survival months observed between new venture start-ups and business takeovers reduce from 4.55 to 4.08 months; yet, they remain still statistically significant ($P < 0.001$).

As a result of the matching, the two samples were rendered more comparable. For many variables (e.g., *small-*, *medium-*, and *large-firm experience*), we do not observe statistically significant differences anymore. With regard to some characteristics such as management experience and same sector experience, differences remain. A perfect match is difficult to achieve, as in applying the propensity score matching approach we consider multiple variables that may affect an entrepreneur's entry mode choice.[7] However, even when *t*-tests of certain variables still show some sample differences, means of the matched sample are much more similar to means of the takeover sample after matching. For instance, before matching, only 25% of new venture start-ups were founded with over 16k€as start-up capital (whereas the proportion for business takeovers was 77%); with matching, this proportion increases to 70%.

5.2 Multivariate analysis of survival probabilities from discrete-time duration models

Differences in survival probabilities across the two entry modes (first research question).

In Table 4, we present discrete-time logistic regressions to compare the survival probabilities of new venture start-ups to those of business takeovers for time periods of 1–5 years. For each time period, the left column reports regressions derived from the (full) unmatched ample of 34,872 firms whereas the right column shows estimations based on the (reduced) matched sample of 7516 firms. Because that the survival months are different for each time period (1–5 years), after we transform the dataset from entrepreneur level to entrepreneur-month level, the number of

7 We also use one-to-one nearest neighbor matching (without replacement) to select a matched new venture start-up sample (Leuven and Sianesi, 2003). Tests on the extent of balancing show that with 29 out of 36 variables the standardized percentage bias substantially reduced or remained the same after matching. We replicate our main regressions from Table 5 using one-to-one nearest neighbor matching. Our main findings stay robust.

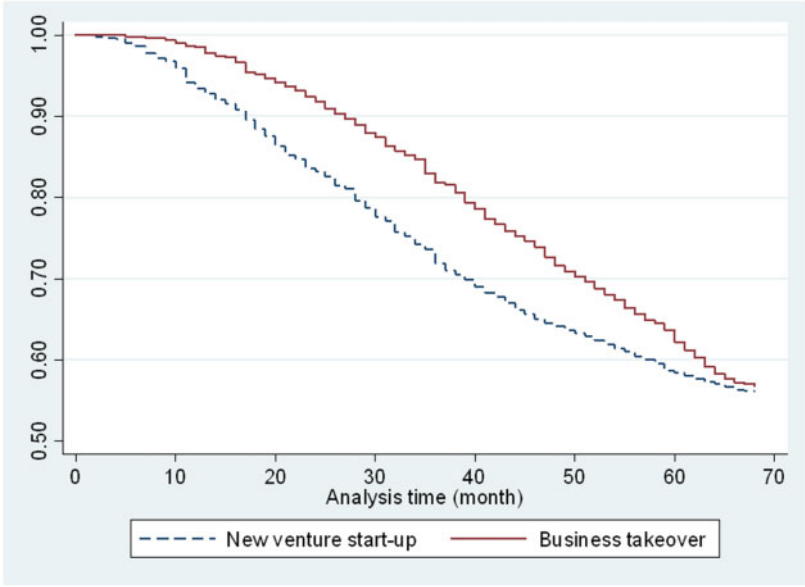

Figure 2. Kaplan–Meier firm survival estimates by entrepreneurship entry modes (after matching, data source: SINE 2002).

observations in Table 4 enlarges substantially and is different for each time period. In all models, we include dummy variable *business takeover* to capture the impact of entrepreneurship entry modes on firms' exit risks.

Odds ratios are reported in Table 4. An odds ratio below one indicates that the corresponding variable reduces the probability of firm exit, i.e., it increases firms' survival chances. On the contrary, an odds ratio above one is negatively associated with firm survival. The estimation result given in Model I shows that over a 1-year lifespan, business takeovers are less likely to exit than new venture start-ups. The odds ratio 0.50 ($P < 0.001$) means that keeping other independent variables fixed, the odds of exit for business takeover are 0.5 times the odds for new venture start-up. This suggests a significant difference between these two forms of entrepreneurship regarding their survival chances. This effect still exists even when we consider potential selection (odds ratio of 0.46, $P < 0.001$ for Model II). Similarly, we observe positive relationships between firm survival and business takeover in Models III to X (odds ratios <1). Moreover, Model X shows that the odds of exit for business takeovers increase to 0.93 times the odds of exit for new venture start-ups when differences in founder and firm characteristics are controlled for, and the significance level of the odds ratio drops to $P < 0.05$.

5.2.1 Survival patterns observed over the entrepreneurship life cycle (second research question)

From the odds ratios of variable *business takeover* reported in Models I to X in Table 4, we find that firm survival probabilities associated with the two entrepreneurship entry modes converge over the entrepreneurship life cycle. The odds ratios are 0.46 for 2002–2003 (Model II), 0.64 for 2002–2004 (Model IV), 0.71 for 2002–2005 (Model VI), 0.82 for 2002–2006 (Model VIII), and 0.93 for 2002–2007 (Model X). We, therefore, conclude that differences in survival probabilities observed between takeovers and new venture start-ups decrease over the entrepreneurship life cycle.

5.2.2 Comparison of survival determinants across the two entry modes (third research question)

We, analyze, the effect of a set of independent variables on the survival probabilities of new venture start-ups versus business takeovers using discrete-time duration regressions. Table 5 reports the estimation results based on three subsamples of data for 2002–2007: the complete new venture start-up sample (31,114 firms, Model I), the matched new venture start-up sample (3758 firms, Model II), and the business takeover sample (3758 firms, Model III). Moreover, we conduct several Chow tests to compare the estimates of Model III with the estimates of Models I and II. The Chow tests determine whether respective effect sizes are statistically significantly different from one another.

Table 4. Discrete-time logistic regressions of firm survival with matched and unmatched samples (SINE 2002)

	2002–2003		2002–2004		2002–2005		2002–2006		2002–2007	
	Model I: Unmatched sample Odds ratio	Model II: Matched sample Odds ratio	Model III: Unmatched sample Odds ratio	Model IV: Matched sample Odds ratio	Model V: Unmatched sample Odds ratio	Model VI: Matched sample Odds ratio	Model VII: Unmatched sample Odds ratio	Model VIII: Matched sample Odds ratio	Model IX: Unmatched sample Odds ratio	Model X: Matched sample Odds ratio
Entrepreneurship entry mode										
Business takeover	0.50***	0.46***	0.64***	0.64***	0.71***	0.71***	0.80***	0.82***	0.90**	0.93*
	(0.04)	(0.04)	(0.03)	(0.04)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Type of work experience										
Benchmark: small-firm experience										
Medium-firm experience	1.18***	1.67***	1.05	1.32**	1.01	1.15	0.96	1.09	0.97	1.08
	(0.06)	(0.22)	(0.04)	(0.13)	(0.03)	(0.09)	(0.03)	(0.08)	(0.03)	(0.07)
Large-firm experience	1.08	0.83	1.04	1.10	1.01	0.96	0.98	0.88	1.02	0.93
	(0.05)	(0.12)	(0.04)	(0.10)	(0.03)	(0.07)	(0.03)	(0.06)	(0.02)	(0.05)
Management experience	0.88**	0.88	0.88***	1.04	0.87***	0.92	0.85***	0.83**	0.87***	0.86**
	(0.04)	(0.13)	(0.03)	(0.09)	(0.02)	(0.07)	(0.02)	(0.05)	(0.02)	(0.05)
Same sector experience	0.80***	0.70***	0.81***	0.78***	0.82***	0.77***	0.81***	0.73***	0.81***	0.71***
	(0.03)	(0.06)	(0.02)	(0.05)	(0.02)	(0.04)	(0.02)	(0.03)	(0.01)	(0.03)
Educational attainment										
Benchmark: no diploma										
Lower than A-level diploma	0.99	1.03	0.94	0.92	0.90***	0.85*	0.90***	0.89	0.89***	0.85**
	(0.05)	(0.13)	(0.03)	(0.08)	(0.03)	(0.06)	(0.02)	(0.05)	(0.02)	(0.04)
A-level diploma	0.74***	1.08	0.81***	0.88	0.82***	0.83*	0.85***	0.89	0.83***	0.83**
	(0.05)	(0.16)	(0.03)	(0.09)	(0.03)	(0.06)	(0.03)	(0.06)	(0.02)	(0.05)
A-level plus 2 years education	0.78***	0.72	0.85***	0.73*	0.80***	0.68***	0.78***	0.67***	0.79***	0.68***
	(0.05)	(0.14)	(0.04)	(0.09)	(0.03)	(0.07)	(0.03)	(0.06)	(0.03)	(0.05)
A-level plus over 2 years education	0.72***	0.71	0.70***	0.51***	0.68***	0.52***	0.69***	0.55***	0.67***	0.54***
	(0.05)	(0.15)	(0.03)	(0.07)	(0.03)	(0.06)	(0.02)	(0.05)	(0.02)	(0.05)
Received entrepreneurial training	0.91*	0.91	0.92**	0.89	0.91***	0.81***	0.92***	0.84***	0.93***	0.84***
	(0.03)	(0.08)	(0.03)	(0.06)	(0.02)	(0.04)	(0.02)	(0.04)	(0.02)	(0.03)
Entrepreneurial motivation										
Full-time entrepreneurship	0.94	1.00	0.93*	0.75**	0.95	0.78***	0.96	0.83**	0.97	0.88*
	(0.04)	(0.15)	(0.03)	(0.07)	(0.03)	(0.06)	(0.02)	(0.05)	(0.02)	(0.05)

(continued)

Table 4. Continued

	2002–2003		2002–2004		2002–2005		2002–2006		2002–2007	
	Model I: Unmatched sample Odds ratio	Model II: Matched sample Odds ratio	Model III: Unmatched sample Odds ratio	Model IV: Matched sample Odds ratio	Model V: Unmatched sample Odds ratio	Model VI: Matched sample Odds ratio	Model VII: Unmatched sample Odds ratio	Model VIII: Matched sample Odds ratio	Model IX: Unmatched sample Odds ratio	Model X: Matched sample Odds ratio
Benchmark: necessity/mixed entrepreneurship										
Opportunity entrepreneurship	0.80***	0.64***	0.84***	0.70***	0.83***	0.77***	0.83***	0.79***	0.85***	0.84***
	(0.03)	(0.07)	(0.02)	(0.05)	(0.02)	(0.05)	(0.02)	(0.04)	(0.02)	(0.04)
Growth ambition	0.94	1.02	1.01	1.04	1.09***	1.08	1.11***	1.11*	1.10***	1.07
	(0.03)	(0.09)	(0.03)	(0.07)	(0.02)	(0.05)	(0.02)	(0.05)	(0.02)	(0.04)
Long-term entrepreneurship	0.40***	0.37***	0.51***	0.53***	0.54***	0.49***	0.57***	0.49***	0.59***	0.52***
	(0.02)	(0.04)	(0.02)	(0.04)	(0.02)	(0.03)	(0.01)	(0.03)	(0.01)	(0.03)
Support for the entrepreneur										
Entrepreneurs in close relational circle	0.97	0.88	0.98	0.98	0.97	1.01	0.95**	1.01	0.96*	1.00
	(0.03)	(0.08)	(0.02)	(0.06)	(0.02)	(0.05)	(0.02)	(0.04)	(0.02)	(0.04)
Received social benefit	1.12	0.93	1.20***	0.92	1.17***	1.17	1.16***	1.12	1.15***	1.12
	(0.07)	(0.16)	(0.05)	(0.11)	(0.04)	(0.11)	(0.04)	(0.10)	(0.04)	(0.09)
Solo entrepreneurship	1.24***	1.25*	1.25***	1.20**	1.22***	1.23***	1.20***	1.20***	1.17***	1.18***
	(0.04)	(0.11)	(0.03)	(0.07)	(0.02)	(0.06)	(0.02)	(0.05)	(0.02)	(0.04)
Sociodemographic status										
Benchmark: age under 35										
Age between 35 and 49	0.76***	0.67***	0.81***	0.76***	0.86***	0.81***	0.86***	0.84***	0.86***	0.83***
	(0.03)	(0.06)	(0.02)	(0.05)	(0.02)	(0.04)	(0.02)	(0.04)	(0.02)	(0.03)
Age over 50	0.63***	0.47***	0.74***	0.65***	0.84***	0.74***	0.88***	0.75***	0.90***	0.79**
	(0.04)	(0.09)	(0.03)	(0.08)	(0.03)	(0.07)	(0.03)	(0.06)	(0.02)	(0.06)
Female	1.11**	1.20*	1.10**	1.10	1.04	0.97	1.04*	0.98	1.04	0.99
	(0.04)	(0.11)	(0.03)	(0.07)	(0.02)	(0.05)	(0.02)	(0.04)	(0.02)	(0.04)
French	0.88*	0.80	0.79***	0.79*	0.83***	0.87	0.85***	0.89	0.83***	0.90
	(0.05)	(0.12)	(0.03)	(0.08)	(0.03)	(0.07)	(0.02)	(0.06)	(0.02)	(0.06)
Firm characteristics										
Benchmark: No innovation										
Product innovation	0.96	0.88	0.96	0.86*	0.98	0.93	0.99	0.92	0.99	0.91*
	(0.04)	(0.09)	(0.03)	(0.06)	(0.02)	(0.05)	(0.02)	(0.04)	(0.02)	(0.04)
Process innovation	0.94	0.82	1.03	0.93	1.03	1.07	0.99	0.96	0.98	0.88
	(0.06)	(0.14)	(0.05)	(0.10)	(0.04)	(0.09)	(0.03)	(0.07)	(0.03)	(0.06)

(continued)

Table 4. Continued

	2002–2003		2002–2004		2002–2005		2002–2006		2002–2007	
	Model I: Unmatched sample Odds ratio	Model II: Matched sample Odds ratio	Model III: Unmatched sample Odds ratio	Model IV: Matched sample Odds ratio	Model V: Unmatched sample Odds ratio	Model VI: Matched sample Odds ratio	Model VII: Unmatched sample Odds ratio	Model VIII: Matched sample Odds ratio	Model IX: Unmatched sample Odds ratio	Model X: Matched sample Odds ratio
Organizational innovation	0.88**	0.81	1.03	0.95	1.01	1.00	1.01	0.96	1.02	0.96
	(0.04)	(0.09)	(0.03)	(0.07)	(0.03)	(0.06)	(0.02)	(0.05)	(0.02)	(0.04)
Benchmark: start-up capital: <16k										
Start-up capital: 16-80k	0.74***	0.76**	0.80***	0.72***	0.84***	0.90*	0.85***	0.90*	0.85***	0.90**
	(0.04)	(0.07)	(0.03)	(0.05)	(0.02)	(0.05)	(0.02)	(0.04)	(0.02)	(0.04)
Start-up capital: >80k	0.55***	0.56***	0.59***	0.50***	0.66***	0.71***	0.68***	0.73***	0.70***	0.74***
	(0.05)	(0.08)	(0.04)	(0.04)	(0.03)	(0.05)	(0.03)	(0.04)	(0.03)	(0.04)
Received public aid	1.05	1.03	1.01	1.11	0.99	1.03	0.99	1.02	0.98	1.03
	(0.04)	(0.10)	(0.03)	(0.08)	(0.02)	(0.06)	(0.02)	(0.05)	(0.02)	(0.04)
Percentage of self-funding	1.15***	0.97	1.11***	1.04	1.08***	1.04	1.07**	1.03	1.07***	1.05
	(0.05)	(0.13)	(0.03)	(0.09)	(0.03)	(0.07)	(0.02)	(0.06)	(0.02)	(0.06)
Log number of employees	0.91*	0.83*	1.06*	0.99	1.05**	0.97	1.06***	1.00	1.06***	1.03
	(0.03)	(0.06)	(0.03)	(0.05)	(0.02)	(0.04)	(0.02)	(0.03)	(0.02)	(0.03)
Urban	1.17***	1.39***	1.22***	1.25***	1.22***	1.22***	1.21***	1.21***	1.19***	1.21***
	(0.04)	(0.12)	(0.03)	(0.07)	(0.03)	(0.06)	(0.02)	(0.05)	(0.02)	(0.04)
Industry dummies (seven categories)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N firms (firm years)	34,872	7516	34,872	7516	34,872	7516	34,872	7516	34,872	7516
	(665,847)		(1,010,560)							
		(137,384)		(214,577)	(1,309,760)	(284,405)	(1,574,527)	(344,948)	(1,813,241)	(398,516)
Log pseudolikelihood	−21,997.29	−3562.54	−41,566.02	−7559.63	−61,906.77	−11,708.34	−75,225.34	−15,029.90	−87,471.03	−18,322.01
Wald chi2	87,958.51	14,872.23	160,578.98	30,192.52	230,592.66	45,016.31	281,284.40	57,413.88	328,234.63	69,314.39

Notes: This is a discrete-time model using stata command *logit*. Estimation results of periods are generated but are not reported in the table. Exponentiated coefficients are presented; standard errors are in the parentheses. Odds ratio is an estimate of risk. A lower than one odds ratio suggests that the corresponding variable reduces the firm's exit risk, i.e., it contributes to firm survival; otherwise, it endangers firm survival.

Significance level: $*P < 0.05$, $**P < 0.01$, $***P < 0.001$.

Table 5. Discrete-time logistic regressions on determinants of firm survival for new venture start-up versus business take-over (data source: SINE 2002; time span from 2002 to 2007)

	New venture (unmatched sample) Odds ratio Model I	New venture (matched sample) Odds ratio Model II	Business takeover Odds ratio Model III	Chow test *P*-value I vs. III	Chow test *P*-value II vs. III
Type of work experience					
Benchmark: small-firm experience					
Medium-firm experience	0.98	1.39***	0.88	0.422	0.000
	(0.03)	(0.12)	(0.09)		
Large-firm experience	1.02	0.89	1.00	0.803	0.259
	(0.03)	(0.08)	(0.08)		
Management experience	0.87***	0.87	0.96	0.221	0.311
	(0.02)	(0.07)	(0.08)		
Same sector experience	0.83***	0.76***	0.69***	0.013	0.504
	(0.02)	(0.04)	(0.04)		
Educational attainment					
Benchmark: no diploma					
Lower than A-level diploma	0.91***	0.91	0.78**	0.141	0.253
	(0.02)	(0.07)	(0.06)		
A-level diploma	0.84***	0.88	0.78**	0.531	0.366
	(0.03)	(0.08)	(0.07)		
A-level plus 2 years education	0.80***	0.63***	0.75**	0.756	0.157
	(0.03)	(0.07)	(0.08)		
A-level plus over 2 years education	0.69***	0.59***	0.59***	0.399	0.794
	(0.02)	(0.07)	(0.08)		
Received entrepreneurial training	0.96*	0.91	0.84**	0.061	0.428
	(0.02)	(0.05)	(0.05)		
Entrepreneurial motivation					
Full-time entrepreneurship	0.98	0.80**	0.87	0.252	0.429
	(0.02)	(0.07)	(0.08)		
Benchmark: necessity/mixed entrepreneurship					
Opportunity entrepreneurship	0.85***	0.76***	0.94	0.154	0.021
	(0.02)	(0.05)	(0.07)		
Growth ambition	1.10***	1.06	1.10	0.772	0.723
	(0.02)	(0.06)	(0.06)		
Long-term entrepreneurship	0.61***	0.57***	0.47***	0.073	0.293
	(0.02)	(0.05)	(0.04)		
Support for the entrepreneur					
Entrepreneurs in close relational circle	0.95**	0.96	1.06	0.095	0.223
	(0.02)	(0.05)	(0.06)		
Received social benefit	1.16***	1.20	1.05	0.361	0.333
	(0.04)	(0.13)	(0.13)		
Solo entrepreneurship	1.18***	1.24***	1.13*	0.361	0.143
	(0.02)	(0.07)	(0.06)		
Sociodemographic status					
Benchmark: age under 35					
Age between 35 and 49	0.86***	0.85**	0.81***	0.430	0.803
	(0.02)	(0.05)	(0.05)		
Age over 50	0.90***	0.80*	0.81*	0.427	0.801
	(0.03)	(0.08)	(0.09)		
Female	1.04	0.97	1.07	0.680	0.220
	(0.02)	(0.06)	(0.06)		

(continued)

Table 5. Continued

	New venture (unmatched sample) Odds ratio Model I	New venture (matched sample) Odds ratio Model II	Business takeover Odds ratio Model III	Chow test *P*-value I vs. III	Chow test *P*-value II vs. III
French	0.83***	0.94	0.91	0.305	0.915
	(0.02)	(0.09)	(0.09)		
Firm characteristics					
Benchmark: no innovation					
Product innovation	1.00	0.99	0.95	0.540	0.698
	(0.02)	(0.06)	(0.06)		
Process innovation	1.00	0.91	0.89	0.375	0.961
	(0.03)	(0.09)	(0.09)		
Organizational innovation	1.04	1.00	0.91	0.073	0.358
	(0.03)	(0.07)	(0.06)		
Benchmark: start-up capital: <16k					
Start-up capital: 16–80k	0.83***	0.75***	0.96	0.038	0.004
	(0.02)	(0.05)	(0.06)		
Start-up capital: >80k	0.65***	0.51***	0.93	0.000	0.000
	(0.03)	(0.05)	(0.07)		
Received public aid	0.97	0.95	1.14*	0.013	0.043
	(0.02)	(0.06)	(0.07)		
Percentage of self-funding	1.06**	1.06	1.16	0.278	0.446
	(0.02)	(0.09)	(0.10)		
Log number of employees	1.10***	1.12**	0.88**	0.000	0.000
	(0.02)	(0.05)	(0.04)		
Urban	1.19***	1.32***	1.18**	0.670	0.073
	(0.02)	(0.07)	(0.06)		
Industry dummies (seven categories)	Yes	Yes	Yes		
N firms (firm years)	31,114	3758	3758		
	(1,602,549)	(191,582)	(195,677)		
Log pseudolikelihood	−78,146.94	−9106.40	−8903.45		
Wald chi^2	291,893.78	33,863.81	32,978.10		

Notes: Exponentiated coefficients are presented; standard errors are in the parentheses.
Significance level: $*P < 0.05$, $**P < 0.01$, $***P < 0.001$.

The comparison of Models I and III reveals differences among a number of variables regarding their effects on the survival probabilities of new venture start-ups versus business takeovers. *Same sector experience* among entrepreneurs reduces the risk of failure for both new venture start-ups and business takeovers. However, such an experience has a stronger influence on business takeovers than on new venture start-ups. At the firm level, *start-up capital* significantly extends the survival time of new venture start-ups: the greater the amount of start-up capital, the lower the risk of business failure. However, takeovers' exit probabilities are not affected by the amount of start-up capital. Furthermore, to our surprise, *received public aid* does not help prolong business takeover longevity; instead, it significantly increases their mortality rate. A similar effect cannot be found for new venture start-ups. Finally, initial firm size measured by *log number of employees* has a negative impact on the survival probabilities of new venture start-ups. In contrast, this effect is positive for business takeovers.

When comparing Models II and III, the picture becomes somewhat different. For matched samples, the Chow test results show that some differences in survival determinants observed between the two groups disappear. Hence, some differences in the survival determinants of the two groups are attributable to different group compositions and not to the entrepreneurship entry mode itself. Survival determinants with similar effects on both groups include *same*

sector experience, *educational attainment*, *long-term entrepreneurship*, *solo entrepreneurship*, *age*, and location in an *urban* area. Nevertheless, the two groups differ on some determinants of firm survival. For example, the widely discussed small-firm effect (Stuart and Abetti, 1990; Elfenbein *et al.*, 2010; Klapper and Richmond, 2011; Sørensen and Phillips, 2011) seems to only hold for new venture start-ups and not for business takeovers. Work experience with a small firm does not increase the survival chances of a business takeover. Another difference between the two groups relates to the effects of opportunity entrepreneurship. Being an opportunity entrepreneur makes a difference and increases chances of survival for new venture start-ups but not for business takeovers. Finally, similar to the results using an unmatched sample, (matched) new venture start-ups differ from takeovers in terms of *start-up capital*, *received public aid*, and *log number of employees*.

6. Robustness checks

6.1 Replication using a different sample

As already noted above, we aimed to replicate our main findings using a similar dataset from the same data provider but collected at a different point in time. In 2006, the INSEE initiated again a new nationwide survey on new ventures and business takeovers across France. Its basis is the total population of 144,182 firms newly founded or taken over in the first half year of 2006 and follows their development over a period of 3 years (not 5 years as for dataset SINE 2002). This dataset resembles SINE 2002 and is proper for replication. Nevertheless, the following differences across the two datasets should be addressed. As some adjustments were made to the questionnaires sent to entrepreneurs in 2006, the variables *percentage of self-funding* and *industry* are not included in the replication dataset, and the variable *number of employees* is now a categorical variable instead of a continuous one. Moreover, the variable *innovation* is defined slightly differently from how it is defined in dataset SINE 2002.[8] Different from dataset SINE 2002, the INSEE institute did not send questionnaires to all firms but drew a sample of 56,000 firms using criteria of representativeness (location, industry classification code, origin of creation, etc.; INSEE, 2019).[9] We construct the replication sample from dataset SINE 2006 following the same procedures as those applied to the dataset SINE 2002. The final sample consists of 33,294 new firms and takeovers (59.5% of the 56,000 firms of the survey and 23.1% of the total population of the first half year of 2006), of which 2835 refer to business takeovers (8.5%) while 30,459 (91.5%) refer to new venture start-ups.

Table A1 in the Appendix presents discrete-time logistic regressions based for 1, 2, and 3 years using SINE 2006. With respect to the first research question, the replication shows similar results as those of our main analysis: business takeovers survive significantly longer and more often than new venture start-ups. Our findings for the second research question are also replicated. In line with the main analysis, odds ratios associated with the two entry modes converge over the entrepreneurship life cycle. Regarding the third research question on differences in survival determinants observed between the two entry modes, our findings only partially replicate (Table A2 in the Appendix). Specifically, *small-firm experience* increases survival for both entry modes in contrast to *large-firm experience*; however, the effect difference across the two entry modes is insignificant ($P = 0.823$). Moreover, opportunity motivation contributes to new ventures' survival chances but not to business takeovers; however, the difference between the two odds ratios is statistically insignificant ($P = 0.669$). At the firm level, Chow tests investigating differences in survival determinants of the two entry modes show that takeovers with one to two employees are exposed to greater failure risk than firms with more than six employees, while the impact of firm size on new ventures' survival is insignificant. Findings relating to the third research question may have failed to replicate due to different time spans covered (3 years rather than 5 years) or due to different observation years measured (the 2006 cohort versus the 2002 cohort)

6.2 Alternative estimation results

As another set of robustness checks, we try alternative estimation models.

8 Instead of organizational innovation, SINE 2006 asked the respondents whether their firms adopted innovative sales concept. Hence, the corresponding variable in dataset SINE 2006 is coded as concept innovation.

9 The survey sample consists of 38.8% out of the total population of new firms and takeovers in the first half of 2006. *Source*: Créations et créateurs d'entreprises. Première interrogation 2006, April 2019, https://www.insee.fr/fr/metadonnees/source/operation/s1080/presentation

6.2.1 Frailty model

Frailty models account for variability due to unobserved individual factors. The "frailty" component attributed to each individual may lead to different hazards and survival functions across individuals. In our sample, unobserved heterogeneity may arise due to differences in entrepreneurs' characteristics which the models without frailty component do not take into account. To deal with this issue, we conduct a frailty model using the dataset SINE 2002. The "frailty" component α is assumed to follow some distribution for which $\alpha > 0$ and its mean value equals to 1. Stata provides us with two types of distributions: the gamma distribution and the inverse-Gaussian distribution, both of which normally yield similar results (Kleinbaum and Klein, 2012). We conduct a Weibull model with gamma distribution using Stata 15. The likelihood ratio tests of including the variance of the frailty α are performed. The *P* values of the tests are all below 0.001, rejecting the null hypotheses that the variance equals zero. Unobserved individual factors captured by the frailty component α are taken into account by the frailty models. In line with our main findings, the results of frailty models show that business takeovers are more likely to survive than new venture start-ups. Moreover, the hazard ratio of business takeover approaches one as the observation period extends from 1 year (2002–2003) to 5 years (2002–2007). We stress the issue of unobserved heterogeneity as a limitation in the last section. The results of this particular robustness check are available from the first author.

6.2.2 Stratified cox model

The regressions from our main analysis are based on individual regressions for each data period. Although one can observe that the survival probabilities of business takeovers and new venture start-ups become more equal across the different models and over the entrepreneurship life cycle, we lack a formal statistical test. To mitigate this concern, we run a stratified Cox model stratified on firm age as a robustness check. In this regression, we include interaction terms using firm age dummy variables and the takeover dummy. The stratified Cox regression results confirmed our main finding that business takeovers have higher survival probabilities than new venture start-ups. Looking at the interaction terms provides support for our second main finding: the survival chances of new venture start-ups approach those of business takeovers as the observation period becomes larger and the firm becomes older. Again, the full and detailed results are available from the first author.

6.2.3 Discrete-time proportional hazards model

Finally, we estimate a discrete-time proportional hazards model using Stata command *cloglog*. The results are again similar to those of our main analysis. There is a survival advantage of business takeovers over new venture start-ups which is found to decrease over the entrepreneurship life cycle. As with the main results, the two entry modes not only share several common survival determinants but also differ in some aspects. *Small-firm experience*, *opportunity motivation*, *start-up capital*, *received public aid*, and initial *log number of employees* affect the survival chances of the two entry modes in different ways. Again, the full and detailed results are available from the first author.

7. Discussion and conclusion

The large body of literature on firm survival (Aldrich and Auster, 1986; Bates, 1990; Duchesneau and Gartner, 1990; Brüderl *et al.*, 1992; Cooper *et al.*, 1994; Gimeno *et al.*, 1997; Shepherd *et al.*, 2000; Santarelli and Vivarelli, 2007; Elfenbein *et al.*, 2010; Vivarelli, 2013; Stucki, 2014) is remarkably silent on how entrepreneurship entry modes influence firm survival. The present study investigates three research questions in this regard. The first research question focuses on differences in survival rates observed between business takeovers and new venture start-ups; the second research question traces these differences over the entrepreneurship life cycle; and the third research question focuses on the respective survival determinants of the two entry modes.

For the first research question, we find that business takeovers have a higher survival rate and exist longer than new venture start-ups, which is in line with prior research (Bates, 1990; Dyke *et al.*, 1992). We also find evidence for selection effects. As was expected, new venture start-ups and business takeovers are indeed two very distinct groups. Business takeovers are typically larger, require more capital, and attract a different kind of entrepreneur than new venture start-ups. In accounting for these differences in entrepreneur and firm characteristics through a matched sample design, we find that the difference in survival probability levels observed between the two entry modes reduces. This finding partially confirms the resource-based perspective, which postulates that differences in resources can

partially explain why new venture start-ups and business takeovers should have different survival rates. Thus, it seems to be not only the entry mode but also characteristics of the entrepreneur and firm that are responsible for differences in survival probability observed. In other words, differences in survival probabilities observed between the two entry modes are also the result of a selection effect.

Our second research question takes a dynamic perspective and refers to the evolution of the organizational mortality of business takeovers and new venture start-ups over the entrepreneurship life cycle. Our findings are in line with predictions made from an organizational ecology perspective. Initially, new venture start-ups seem to suffer from a liability of newness (Stinchcombe, 1965; Brüderl and Schussler, 1990), which explains their lower survival rates relative to those of business takeovers. However, this liability of newness seems to reduce over the entrepreneurial life cycle, which is in line with prior research on the decreasing mortality rates of new ventures over the firm life cycle (Brüderl *et al.*, 1992).

Regarding the third research question, we find that many of the survival determinants have similar effects in both entrepreneurship entry modes. Having work experience from the same sector is conducive to opportunity exploration and exploitation and increases a firm's survival chances for both entry modes (Brüderl *et al.*, 1992; Bosma *et al.*, 2004). A similar result is obtained for entrepreneur's educational attainment, which is positively associated with survival probability. Prior literature argues that highly educated individuals are better able to discover and exploit business opportunities and to solve difficult problems while running their firms (Bates, 1990; Cooper *et al.*, 1994; Gimeno *et al.*, 1997; Ganotakis, 2012; Boyer and Blazy, 2014). This positive effect of education on firm survival seems to hold for both new venture start-ups and business takeovers. We also find that younger entrepreneurs are more likely to exit than senior entrepreneurs, which can be explained by a lack of experience and resources of the former group. Moreover, solo entrepreneurship seems to be less stable than those founded by at least two persons, suggesting a positive impact of entrepreneurial teams on firm survival (Jin *et al.*, 2017). Finally, we find that irrespective of entrepreneurship entry modes, firms located in urban areas are more likely to exit than firms in rural areas. This finding contradicts the idea that urban firms have a competitive advantage over rural firms due to greater access to human and financial resources. Instead, our finding supports the argument that competition between firms and for resources may be more intense in urban than rural areas (Headd, 2003; Stam *et al.*, 2010), making survival more difficult.

Nevertheless, some differences between the two groups can be observed. The widely discussed positive effect of work experience from small firms on entrepreneurship (Stuart and Abetti, 1990; Elfenbein *et al.*, 2010; Klapper and Richmond, 2011; Sørensen and Phillips, 2011) seems to only hold for new venture start-ups and not for business takeovers when controlling for selection bias. Elfenbein *et al.* (2010) show that small firms generate more entrepreneurs than large firms and that these entrepreneurs earn more in the initial stages of entrepreneurship than their counterparts from large firms. Gompers *et al.* (2005) explain this positive effect of small-firm experience through the hierarchies of valuable networks that employees from small firms can build with founders, suppliers, customers, and even competitors. Another argument draws from the jack-of-all-trades theory proposed by Lazear (2005). Small-firm employees are more likely than large-firm employees to develop a broad and balanced set of business skills, as they are usually assigned multifaceted and multidimensional tasks (Hyytinen and Maliranta, 2008). Prior research shows that balanced skills increase entrepreneurship success (Lazear, 2004). Our finding that small-firm experience matters more for new venture start-ups versus business takeovers can be explained through such a jack-of-all-trades perspective on entrepreneurship. Compared with new venture start-ups, business takeovers require developing fewer balanced skills, as such firms are already more developed and specialized and have already found an appropriate business model. It seems that in business takeovers specialized knowledge and skills may be more valuable than they are for new venture start-ups. Such knowledge and skills are typically obtained by working in large firms.

Another difference between the two entry modes concerns opportunity entrepreneurship, which seems to have a survival-enhancing effect only on new venture start-ups and not on business takeovers. Opportunity entrepreneurship is an indicator of entrepreneurial motivation. Compared with other types of entrepreneurs, opportunity entrepreneurs have a strong intrinsic motivation to become entrepreneurs. Our empirical results imply that such an intrinsic motivation has a stronger survival-enhancing effect on new venture start-ups than on business takeovers, which makes intuitive sense as entrepreneurial motivation is a crucial factor particularly in early phases of building a venture when liabilities of newness and smallness are strong. In contrast, for business takeovers, survival chances depend less on entrepreneurial motivation. The firm has already found its business model and benefits from established relationships with customers and suppliers. These findings are also in line with those of Gimeno *et al.* (1997) who show

that intrinsically motivated entrepreneurs are less likely to exit, as they care strongly about the nonfinancial aspects of entrepreneurship. Supporting our argumentation, Binder and Coad (2013), as well as Block and Koellinger (2009), show that entrepreneurs who voluntarily pursue entrepreneurial activities are more satisfied with their lives than entrepreneurs who choose to create a new firm to avoid unemployment.

Finally, it can be observed that at the firm level, start-up capital is positively linked to survival for new venture start-ups, which is in line with literature on the positive impact of initial financial capital on firm survival (Cooper *et al.*, 1994). However, this effect does not hold for takeovers. Moreover, public aid is negatively associated with the survival chances of business takeovers and is not related to new venture start-ups. This finding suggests a nonexistent or even negative impact of public aid on entrepreneurship success. Even though our empirical analysis does not allow for a causal interpretation, our finding points to potential inefficiencies of national entrepreneurship support systems (Lasch *et al.*, 2007). Such inefficiencies appear to be stronger for business takeovers than for new venture start-ups. Programs such as the French national funding scheme ACCRE (*Aide aux Chômeurs Créateurs ou Repreneurs d'Entreprise*), which supports unemployed people in becoming entrepreneurs, must be critically evaluated in light of our results. Finally, we find different effects of initial firm size for the two entry modes. Surprisingly, initial firm size is negatively related to the survival of new venture start-ups. This might be explained by the greater persistence of micro firms which constitute a significant part of the new venture start-up sample. Also, it is noted that solo entrepreneurs have higher risks of exit. Thus, the impact of firm size measured by employees might be nonlinear for new venture start-ups.

Our study has a number of limitations that (sometimes) offer fruitful avenues for further research. First, as we are unable to identify the exact reasons for business exit, we cannot distinguish between cases of voluntary and involuntary exit. We are also unable to track ownership changes, which do not allow us to identify (successful) business sales. This is a limitation, as Wennberg *et al.* (2010) show that survival determinants may differ between different forms of exit. Further research exploring this issue should investigate the link between entrepreneurship entry modes and forms of business exit. Second, the issue of unobserved heterogeneity can arise when not all potentially relevant factors are accounted for in the regression model. Although we have included a large number of control variables in the model, this concern may still exist. Future surveys should try to enlarge the scope of questions posed to the entrepreneurs to include an even larger set of control variables affecting entrepreneurial success and survival. Third, our dataset only allows us to measure characteristics of ventures and entrepreneurs in the initial stages. Most importantly, we cannot observe the dynamics of entrepreneurial teams over time. It might very well be that business takeovers and new venture start-ups differ in this regard and that founder turnover is more likely to occur with one entrepreneurship entry mode than with the other. Future studies may investigate how entrepreneurship entry modes influence entrepreneurial team compositions and founder turnover and how this, in turn, influences firm survival. Fourth, with respect to the replication of our findings, data restrictions prevented us from covering a consistent entrepreneurship life cycle time period (3 years versus 5 years in the dataset SINE 2002). Examining a time period of the same length would help further explore our third research question and refine our results. Fifth, further moderation analyses by including interaction terms could provide insights on the conditional effects of some firm survival determinants and how these conditional effects differ by entrepreneurship entry mode. Finally, the majority of independent variables in our dataset are categorical variables. Future research could try to incorporate continuous variables (e.g., years of work experience) and their squared terms to capture possible nonlinear impacts on firm survival.

Acknowledgments

Montpellier Business School (MBS) is a founding member of the public research center Montpellier Research in Management (MRM, Equipe d'Accueil EA4557, University of Montpellier). F.L., F.R., and R.T. are members of the Laboratory of Excellence Entrepreneurship (Labex Entreprendre, University of Montpellier, France), funded by the French government agency Agence Nationale de la Recherche (ANR-10-Labex-11-01). G.X. received a scholarship from the China Scholarship Council.

References

Agarwal, R. and D. B. Audretsch (2001), 'Does entry size matter? The impact of the life cycle and technology on firm survival,' *Journal of Industrial Economics*, **49**(1), 21–43.

Aldrich, H. and E. R. Auster (1986), 'Even dwarfs started small: liabilities of age and size and their strategic implications,' *Research in Organizational Behavior*, **8**, 165–198.
Allison, P. D. (1982), 'Discrete-time methods for the analysis of event histories,' *Sociological Methodology*, **13**, 61–98.
Alvarez, S. A. and L. W. Busenitz (2001), 'The entrepreneurship of resource-based theory,' *Journal of Management*, **27**(6), 755–775.
Amburgey, T. L. and H. Rao (1996), 'Organizational ecology: past, present, and future directions,' *Academy of Management Journal*, **39**(5), 1265–1286.
Audretsch, D. B., E. Santarelli and M. Vivarelli (1999), 'Start-up size and industrial dynamics: some evidence from Italian manufacturing,' *International Journal of Industrial Organization*, **17**(7), 965–983.
Bastié, F., S. Cieply and P. Cussy (2013), 'The entrepreneur's mode of entry: the effect of social and financial capital,' *Small Business Economics*, **40**(4), 865–877.
Bates, T. (1990), 'Entrepreneur human capital inputs and small business longevity,' *Review of Economics and Statistics*, **72**(4), 551–559.
Becker, S. O. and A. Ichino (2002), 'Estimation of average treatment effects based on propensity scores,' *The Stata Journal*, **2**(4), 358–377.
Bertoni, F., M. G., Colombo and A. Quas (2019), 'The role of governmental venture capital in the venture capital ecosystem: an organizational ecology perspective,' *Entrepreneurship Theory and Practice*, **43**(3), 611–628.
Binder, M. and A. Coad (2013), 'Life satisfaction and self-employment: a matching approach,' *Small Business Economics*, **40**(4), 1009–1033.
Block, J. and P. Koellinger (2009), 'I can't get no satisfaction—necessity entrepreneurship and procedural utility,' *Kyklos*, **62**(2), 191–209.
Block, J. and P. Sandner (2009), 'Necessity and opportunity entrepreneurs and their duration in self-employment: evidence from German micro data,' *Journal of Industry, Competition and Trade*, **9**(2), 117–137.
Block, J., R. Thurik, P. van der Zwan and S. Walter (2013), 'Business takeover or new venture? Individual and environmental determinants from a cross-country study,' *Entrepreneurship Theory and Practice*, **37**(5), 1099–1121.
Brito, P. and A. S. Mello (1995), 'Financial constraints and firm post-entry performance,' *International Journal of Industrial Organization*, **13**(4), 543–565.
Bosma, N., M. Van Praag, R. Thurik and G. de Wit (2004), 'The value of human and social capital investments for the business performance of startups,' *Small Business Economics*, **23**(3), 227–236.
Boyer, T. and R. Blazy (2014), 'Born to be alive? The survival of innovative and non-innovative French micro start-ups,' *Small Business Economics*, **42**(4), 669–683.
Brüderl, J., P. Preisendörfer and R. Ziegler (1992), 'Survival chances of newly founded business organizations,' *American Sociological Review*, **57**(2), 227–242.
Brüderl, J. and R. Schussler (1990), 'Organizational mortality: the liabilities of newness and adolescence,' *Administrative Science Quarterly*, **35**(3), 530–547.
Caliendo, M. and S. Kopeinig (2008), 'Some practical guidance for the implementation of propensity score matching,' *Journal of Economic Surveys*, **22**(1), 31–72.
Carroll, G. R. and J. Delacroix (1982), 'Organizational mortality in the newspaper industries of Argentina and Ireland: an ecological approach,' *Administrative Science Quarterly*, **27**(2), 169–198.
Colombo, M. G., M. Delmastro and L. Grilli (2004), 'Entrepreneurs' human capital and the start-up size of new technology-based firms,' *International Journal of Industrial Organization*, **22**(8–9), 1183–1211.
Cooper, A. C. and W. C. Dunkelberg (1986), 'Entrepreneurship and paths to business ownership,' *Strategic Management Journal*, **7**(1), 53–68.
Cooper, A. C., F. J. Gimeno-Gascon and C. Y. Woo (1994), 'Initial human and financial capital as predictors of new venture performance,' *Journal of Business Venturing*, **9**(5), 371–395.
Cooper, A. C., C. Y. Woo and W. C. Dunkelberg (1989), 'Entrepreneurship and the initial size of firms,' *Journal of Business Venturing*, **4**(5), 317–332.
de Jong, J. P. J. and O. Marsili (2015), 'Founding a business inspired by close entrepreneurial ties: does it matter for survival?,' *Entrepreneurship Theory and Practice*, **39**(5), 1005–1025.
Dencker, J. C., M. S., Gruber and K. Shah (2009), 'Pre-entry knowledge, learning, and the survival of new firms,' *Organization Science*, **20**(3), 516–537.
Dierickx, I. and K. Cool (1989), 'Asset stock accumulation and sustainability of competitive advantage,' *Management Science*, **35**(12), 1504–1511.
Duchesneau, D. A. and W. B. Gartner (1990), 'A profile of new venture success and failure in an emerging industry,' *Journal of Business Venturing*, **5**(5), 297–312.
Dyke, L. S., E. M. Fischer and A. R. Reuber (1992), 'An inter-industry examination of the impact of owner experience on firm performance,' *Journal of Small Business Management*, **30**(4), 72–87.

Elfenbein, D. W., B. H. Hamilton and T. R. Zenger (2010), 'The small firm effect and the entrepreneurial spawning of scientists and engineers,' *Management Science*, **56**(4), 659–681.
Folta, T. B., F. Delmar and K. Wennberg (2010), 'Hybrid entrepreneurship,' *Management Science*, **56**(2), 253–269.
Frankish, J. S., R. G. Roberts, A. Coad, T. C. Spears and D. J. Storey (2013), 'Do entrepreneurs really learn? Or do they just tell us that they do?,' *Industrial and Corporate Change*, **22**(1), 73–106.
Ganotakis, P. (2012), 'Founders' human capital and the performance of UK new technology based firms,' *Small Business Economics*, **39**(2), 495–515.
Gimeno, J., T. B. Folta, A. C. Cooper and C. Y. Woo (1997), 'Survival of the fittest? Entrepreneurial human capital and the persistence of underperforming firms,' *Administrative Science Quarterly*, **42**(4), 750–783.
Grant, R. M. (1991), 'The resource-based theory of competitive advantage: implications for strategy formulation,' *California Management Review*, **33**(3), 114–135.
Geroski, P. A. (1995), 'What do we know about entry?,' *International Journal of Industrial Organization*, **13**(4), 421–440.
Geroski, P. A., J. Mata and P. Portugal (2010), 'Founding conditions and the survival of new firms,' *Strategic Management Journal*, **31**(5), 510–529.
Gompers, P., J. Lerner and D. Scharfstein (2005), 'Entrepreneurial spawning: public corporations and the genesis of new ventures, 1986 to 1999,' *Journal of Finance*, **60**(2), 577–614.
Hannan, M. T. and J. Freeman (1977), 'The population ecology of organizations,' *American Journal of Sociology*, **82**(5), 929–964.
Headd, B. (2003), 'Redefining business success: distinguishing between closure and failure,' *Small Business Economics*, **21**(1), 51–61.
Helfat, C. E. and M. B. Lieberman (2002), 'The birth of capabilities: market entry and the importance of pre-history,' *Industrial and Corporate Change*, **11**(4), 725–760.
Hölzl, W. (2013), 'Persistence, survival, and growth: a closer look at 20 years of fast-growing firms in Austria,' *Industrial and Corporate Change*, **23**(1), 199–231.
Honjo, Y. (2000), 'Business failure of new firms: an empirical analysis using a multiplicative hazards model,' *International Journal of Industrial Organization*, **18**(4), 557–574.
Hyytinen, A. and M. Maliranta (2008), 'When do employees leave their job for entrepreneurship?,' *Scandinavian Journal of Economics*, **110**(1), 1–21.
INSEE (2019), 'Créations et créateurs d'entreprises. Première interrogation 2006', April 2019, https://www.insee.fr/fr/metadonnees/source/operation/s1080/presentation.
Kay, R. and N. Schlömer-Laufen (2016), 'Business takeover or new venture? (Why) do women prefer new ventures?,' *International Review of Entrepreneurship*, **14**(3), 313–322.
Klapper, L. and C. Richmond (2011), 'Patterns of business creation, survival and growth: evidence from Africa,' *Labour Economics*, **18(Suppl. 1)**, 32–44.
Kleinbaum, D. G. and M. Klein (2012), *Survival Analysis*, 3rd edn. Springer: New York.
Klepper, S. (2002), 'The capabilities of new firms and the evolution of the US automobile industry,' *Industrial and Corporate Change*, **11**(4), 645–665.
Jaouen, A. and F. Lasch (2015), 'A new typology of micro-firm owner-managers,' *International Small Business Journal*, **33**(4), 397–421.
Jenkins, S. P. (1995), 'Easy estimation methods for discrete-time duration models,' *Oxford Bulletin of Economics and Statistics*, **57**(1), 129–136.
Jin, L., K. Madison, N. D. Kraiczy, F. W. Kellermanns, T. R. Crook and J. Xi (2017), 'Entrepreneurial team composition characteristics and new venture performance: a meta-analysis,' *Entrepreneurship Theory and Practice*, **41**(5), 743–771.
Lasch, F., F. L. Roy and S. Yami (2007), 'Critical growth factors of ICT start-ups,' *Management Decision*, **1**(45), 62–75.
Lazear, E. P. (2004), 'Balanced skills and entrepreneurship,' *American Economic Review*, **94**(2), 208–211.
Lazear, E. P. (2005), 'Entrepreneurship,' *Journal of Labor Economics*, **23**(4), 649–680.
Leuven, E. and B. Sianesi (2003), 'PSMATCH2: Stata Module to Perform Full Mahalanobis and Propensity Score Matching, Common Support Graphing, and Covariate Imbalance Testing,' September 2018, https://ideas.repec.org/c/boc/bocode/s432001.html8.
Liu, X. and H. Li (2017), 'Financial constraints and the productivity–survival link: evidence from China's firm-level data,' *Industrial and Corporate Change*, **26**(5), 763–779.
Mata, J. and P. Portugal (1994), 'Life duration of new firms,' *The Journal of Industrial Economics*, **42**(3), 227–245.
Mata, J. and P. Portugal (2002), 'The survival of new domestic and foreign-owned firms,' *Strategic Management Journal*, **23**(4), 323–343.
Mata, J., P. Portugal and P. Guimarães (1995), 'The survival of new plants: start-up conditions and post-entry evolution,' *International Journal of Industrial Organization*, **13**(4), 459–481.
Maul, A. (1994), 'A discrete time logistic regression model for analyzing censored survival data,' *Environmetrics*, **5**(2), 145–157.

Parker, S. C. and C. M. Van Praag (2012), 'The entrepreneur's mode of entry: business takeover or new venture start?,' *Journal of Business Venturing*, **27**(1), 31–46.

Raffiee, J. and J. Feng (2014), 'Should I quit my day job? A hybrid path to entrepreneurship,' *Academy of Management Journal*, **57**(4), 936–963.

Robert, F., A. E. Shoubaki, F. Lasch and L. P. Dana (2017), 'Linking types of ICT entrepreneurs to new firm survival,' *International Journal of Entrepreneurship and Small Business*, **30**(1), 110–146.

Roberts, P. W., S. Klepper and S. Hayward (2011), 'Founder backgrounds and the evolution of firm size,' *Industrial and Corporate Change*, **20**(6), 1515–1538.

Rocha, V., A. Carneiro and C. A. Varum (2015), 'Entry and exit dynamics of nascent business owners,' *Small Business Economics*, **45**(1), 63–84.

Rosenbaum, P. R. and D. B. Rubin (1983), 'The central role of the propensity score in observational studies for causal effects,' *Biometrika*, **70**(1), 41–55.

Santarelli, E. and M. Vivarelli (2007), 'Entrepreneurship and the process of firms' entry, survival and growth,' *Industrial and Corporate Change*, **16**(3), 455–488.

Schulz, M., D. Urbig and V. Procher (2016), 'Hybrid entrepreneurship and public policy: the case of firm entry deregulation,' *Journal of Business Venturing*, **31**(3), 272–286.

Shepherd, D. A., E. J. Douglas and M. Shanley (2000), 'New venture survival: ignorance, external shocks, and risk reduction strategies,' *Journal of Business Venturing*, **15**(5–6), 393–410.

Sørensen, J. B. and D. J. Phillips (2011), 'Competence and commitment: employer size and entrepreneurial endurance,' *Industrial and Corporate Change*, **20**(5), 1277–1304.

Stam, E., R. Thurik and P. van der Zwan (2010), 'Entrepreneurial exit in real and imagined markets,' *Industrial and Corporate Change*, **19**(4), 1109–1139.

Stearns, T. M., N. M. Carter, P. D. Reynolds and M. L. Williams (1995), 'New firm survival: industry, strategy, and location,' *Journal of Business Venturing*, **10**(1), 23–42.

Stinchcombe, A. (1965), 'Social structure and organization,' in J. G. March (ed), *Handbook of Organizations*. Rand McNally: Chicago, pp. 142–193.

Stuart, R. W. and P. A. Abetti (1990), 'Impact of entrepreneurial and management experience on early performance,' *Journal of Business Venturing*, **5**(3), 151–162.

Stucki, T. (2014), 'Success of start-up firms: the role of financial constraints,' *Industrial and Corporate Change*, **23**(1), 25–64.

Vivarelli, M. (2013), 'Is entrepreneurship necessarily good? Microeconomic evidence from developed and developing countries,' *Industrial and Corporate Change*, **22**(6), 1453–1495.

Wennberg, K., J. Wiklund, D. R. DeTienne and M. S. Cardon (2010), 'Reconceptualizing entrepreneurial exit: divergent exit routes and their drivers,' *Journal of Business Venturing*, **25**(4), 361–375.

Xi, G., J. Block, F. Lasch, F. Robert and R. Thurik (2018a), 'Mode of entry into hybrid entrepreneurship: new venture start-up versus business takeover,' *International Review of Entrepreneurship*, **16**(2), 217–240.

Xi, G., J. Block, F. Lasch, F. Robert and R. Thurik (2018b), 'Work experience from paid employment and entry mode to entrepreneurship: business take-over versus new venture start-up,' *Revue de L'Entrepreneuriat*, **17**(2), 91–112.

Appendix

Table A1. Discrete-time logistic regressions of firm survival with matched and unmatched samples (data source: SINE 2006)

	2006–2007		2006–2008		2006–2009	
	Model I: Unmatched sample Odds ratio	Model II: Matched sample Odds ratio	Model III: Unmatched sample Odds ratio	Model IV: Matched sample Odds ratio	Model V: Unmatched sample Odds ratio	Model VI: Matched sample Odds ratio
Entrepreneurship entry mode						
Business takeover	0.38***	0.34***	0.44***	0.40***	0.51***	0.48***
	(0.03)	(0.04)	(0.03)	(0.03)	(0.02)	(0.03)
Type of work experience						
Benchmark: small-firm experience						
Medium-firm experience	1.13**	0.99	1.09**	1.09	1.07*	1.04
	(0.05)	(0.19)	(0.04)	(0.14)	(0.03)	(0.11)
Large-firm experience	1.13**	1.10	1.07*	1.32**	1.06*	1.31***
	(0.05)	(0.16)	(0.03)	(0.13)	(0.03)	(0.10)
Management experience	0.86***	0.98	0.88***	0.89	0.89***	0.83*
	(0.04)	(0.14)	(0.03)	(0.09)	(0.02)	(0.07)
Same sector experience	0.82***	0.88	0.84***	0.87*	0.85***	0.81***
	(0.03)	(0.09)	(0.02)	(0.06)	(0.02)	(0.04)
Educational attainment						
Benchmark: no diploma						
Lower than A-level diploma	1.01	1.13	0.98	1.08	0.96	0.98
	(0.05)	(0.18)	(0.03)	(0.12)	(0.03)	(0.08)
A-level diploma	0.95	1.04	0.91*	0.97	0.90**	0.91
	(0.05)	(0.18)	(0.04)	(0.12)	(0.03)	(0.09)
A-level plus 2 years education	0.90	0.81	0.84***	0.78	0.81***	0.81
	(0.05)	(0.19)	(0.04)	(0.12)	(0.03)	(0.10)
A-level plus over 2 years education	0.84**	1.16	0.80***	0.96	0.78***	0.83
	(0.05)	(0.26)	(0.04)	(0.15)	(0.03)	(0.10)
Received entrepreneurial training	0.90**	1.03	0.96	0.98	0.96*	0.93
	(0.03)	(0.10)	(0.02)	(0.07)	(0.02)	(0.05)
Entrepreneurial motivation						
Full-time entrepreneurship	0.94	1.13	0.97	0.97	1.00	0.90
	(0.04)	(0.26)	(0.03)	(0.14)	(0.03)	(0.10)
Benchmark: necessity/mixed entrepreneurship						
Opportunity entrepreneurship	0.84***	0.82	0.87***	0.82*	0.88***	0.81**
	(0.03)	(0.10)	(0.02)	(0.07)	(0.02)	(0.06)
Growth ambition	0.84***	0.88	0.91***	0.92	0.95*	0.95
	(0.03)	(0.09)	(0.02)	(0.06)	(0.02)	(0.05)
Long-term entrepreneurship	0.45***	0.52***	0.53***	0.57***	0.57***	0.62***
	(0.02)	(0.06)	(0.02)	(0.05)	(0.02)	(0.05)
Support for the entrepreneur						
Entrepreneurs in close relational circle	0.94	0.99	0.96	1.06	0.95*	1.00
	(0.03)	(0.10)	(0.02)	(0.07)	(0.02)	(0.06)
Received social benefit	1.16***	1.04	1.15***	0.97	1.17***	1.06
	(0.05)	(0.22)	(0.04)	(0.14)	(0.03)	(0.12)
Solo entrepreneurship	1.04	0.92	1.08**	1.10	1.07**	1.03
	(0.04)	(0.13)	(0.03)	(0.10)	(0.02)	(0.07)

(continued)

Table A1. Continued

	2006–2007		2006–2008		2006–2009	
	Model I: Unmatched sample Odds ratio	Model II: Matched sample Odds ratio	Model III: Unmatched sample Odds ratio	Model IV: Matched sample Odds ratio	Model V: Unmatched sample Odds ratio	Model VI: Matched sample Odds ratio
Sociodemographic status						
Benchmark: age under 35						
Age between 35 and 49	0.78***	0.83	0.81***	0.86*	0.83***	0.90
	(0.03)	(0.09)	(0.02)	(0.06)	(0.02)	(0.05)
Age over 50	0.80***	0.94	0.83***	0.85	0.86***	0.88
	(0.04)	(0.15)	(0.03)	(0.10)	(0.03)	(0.08)
Female	1.28***	0.95	1.19***	0.98	1.13***	0.98
	(0.04)	(0.10)	(0.03)	(0.07)	(0.02)	(0.06)
French	0.77***	0.75	0.77***	0.73**	0.74***	0.78*
	(0.04)	(0.13)	(0.03)	(0.09)	(0.02)	(0.08)
Firm characteristics						
Benchmark: No innovation						
Product innovation	1.08*	1.14	1.06*	1.14	1.05*	1.08
	(0.04)	(0.12)	(0.03)	(0.08)	(0.02)	(0.06)
Process innovation	0.85**	0.75	0.90**	0.83	0.92*	0.88
	(0.05)	(0.12)	(0.04)	(0.09)	(0.03)	(0.08)
Concept innovation	1.15**	0.98	1.12***	0.94	1.09**	0.89
	(0.05)	(0.14)	(0.04)	(0.09)	(0.03)	(0.07)
Benchmark: start-up capital: <80k						
Start-up capital: >80k	0.76***	0.67**	0.69***	0.61***	0.72***	0.68***
	(0.06)	(0.08)	(0.04)	(0.05)	(0.03)	(0.04)
Received public aid	1.06	1.01	1.03	1.10	1.00	1.01
	(0.04)	(0.11)	(0.03)	(0.08)	(0.02)	(0.06)
Benchmark: number of employees: >6						
Number of employees: 1–2	1.41*	1.76**	1.05	1.19	0.95	1.04
	(0.20)	(0.36)	(0.09)	(0.15)	(0.06)	(0.10)
Log number of employees: 3–5	1.03	1.17	0.91	0.92	0.90	0.92
	(0.16)	(0.24)	(0.09)	(0.12)	(0.07)	(0.09)
Urban	1.01	1.26*	1.07**	1.12	1.14***	1.17**
	(0.03)	(0.12)	(0.02)	(0.07)	(0.02)	(0.06)
Industry dummies (seven categories)	Yes	Yes	Yes	Yes	Yes	Yes
N firms (firm years)	33,294	5670	33,294	5670	33,294	5670
	(628,649)	(104,063)	(942,572)	(162,506)	(1,212,123)	(214,673)
Log pseudolikelihood	−24,575.35	−2783.20	−45,803.27	−5627.01	−64,216.23	−8583.81
Wald chi^2	93,991.91	11,695.02	167,976.62	22,619.75	231,065.24	33,468.59

Notes: We group firms with less than 80,000 euros start-up capital together because, after implementing propensity score matching, the matched new venture sample does not include firms with less than 16,000 euros start-up capital. Moreover, due to data limitation, we do not have continuous data on the number of employees at the start-up or the takeover time as in the dataset SINE 2002. However, a categorical variable defining the number of employees is available. Thus, we add in two dummies representing the number of employees at initial time: between 1 to 2 employees and 3 to 5 employees. Furthermore, as noted in the main text, SINE 2006 does not contain industry variables. Exponentiated coefficients are presented; standard errors are in the parentheses.

Significance level: $^{*}P < 0.05$, $^{**}P < 0.01$, $^{***}P < 0.001$.

Table A2. Discrete-time logistic regressions on determinants of firm survival for new venture start-up versus business takeover (data source: SINE 2006; time span from 2006 to 2009)

	New venture (unmatched sample) Odds ratio Model I	New venture (matched sample) Odds ratio Model II	Business takeover Odds ratio Model III	Chow test *P*-value I vs. III	Chow test *P*-value II vs. III
Type of work experience					
Benchmark: small-firm experience					
Medium-firm experience	1.07*	1.10	0.95	0.487	0.488
	(0.03)	(0.15)	(0.16)		
Large-firm experience	1.05	1.31*	1.37*	0.042	0.823
	(0.03)	(0.14)	(0.17)		
Management experience	0.89***	0.82	0.88	0.958	0.650
	(0.02)	(0.08)	(0.11)		
Same sector experience	0.85***	0.86*	0.75**	0.182	0.230
	(0.02)	(0.06)	(0.07)		
Educational attainment					
Benchmark: no diploma					
Lower than A-level diploma	0.96	1.01	0.97	0.960	0.839
	(0.03)	(0.11)	(0.14)		
A-level diploma	0.90**	0.96	0.88	0.891	0.693
	(0.03)	(0.11)	(0.14)		
A-level plus 2 years education	0.81***	0.80	0.88	0.665	0.701
	(0.03)	(0.13)	(0.17)		
A-level plus over 2 years education	0.78***	0.93	0.76	0.931	0.459
	(0.03)	(0.15)	(0.16)		
Received entrepreneurial training	0.96	0.97	0.84	0.166	0.228
	(0.02)	(0.07)	(0.08)		
Entrepreneurial motivation					
Full-time entrepreneurship	1.01	0.90	0.79	0.196	0.574
	(0.03)	(0.13)	(0.14)		
Benchmark: necessity/mixed entrepreneurship					
Opportunity entrepreneurship	0.88***	0.80*	0.84	0.741	0.669
	(0.02)	(0.07)	(0.09)		
Growth ambition	0.95*	0.90	1.03	0.415	0.247
	(0.02)	(0.06)	(0.10)		
Long-term entrepreneurship	0.57***	0.62***	0.64***	0.331	0.784
	(0.02)	(0.06)	(0.08)		
Support for the entrepreneur					
Entrepreneurs in close relational circle	0.95**	1.00	1.01	0.528	0.970
	(0.02)	(0.07)	(0.09)		
Received social benefit	1.17***	1.06	1.09	0.619	0.907
	(0.03)	(0.17)	(0.17)		
Solo entrepreneurship	1.08***	1.14	0.91	0.151	0.122
	(0.02)	(0.11)	(0.10)		
Sociodemographic status					
Benchmark: age under 35					
Age between 35 and 49	0.83***	0.94	0.85	0.784	0.406
	(0.02)	(0.07)	(0.08)		
Age over 50	0.86***	0.95	0.79	0.591	0.354
	(0.03)	(0.11)	(0.12)		
Female	1.14***	1.01	0.97	0.078	0.745
	(0.02)	(0.08)	(0.09)		

(continued)

Table A2. Continued

	New venture (unmatched sample) Odds ratio Model I	New venture (matched sample) Odds ratio Model II	Business takeover Odds ratio Model III	Chow test *P*-value I vs. III	Chow test *P*-value II vs. III
French	0.74***	0.69**	0.94	0.136	0.129
	(0.02)	(0.09)	(0.16)		
Firm characteristics					
Benchmark: no innovation					
Product innovation	1.05*	1.12	1.01	0.659	0.355
	(0.02)	(0.08)	(0.10)		
Process innovation	0.93*	0.93	0.79	0.312	0.389
	(0.03)	(0.10)	(0.12)		
Concept innovation	1.10**	0.86	0.98	0.385	0.433
	(0.03)	(0.09)	(0.13)		
Benchmark: start-up capital: <80k					
Start-up capital: >80k	0.70***	0.63***	0.82*	0.121	0.058
	(0.03)	(0.07)	(0.08)		
Received public aid	1.00	1.02	1.03	0.823	0.998
	(0.02)	(0.08)	(0.10)		
Benchmark: number of employees: >6					
Number of employees: 1–2	0.89	0.90	1.69**	0.003	0.007
	(0.06)	(0.11)	(0.33)		
Number of employees: 3–5	0.86	0.85	1.20	0.132	0.133
	(0.07)	(0.09)	(0.25)		
Urban	1.14***	1.26***	1.02	0.231	0.058
	(0.02)	(0.08)	(0.09)		
Industry dummies (seven categories)	Yes	Yes	Yes		
N firms (firm years)	30,459	2835	2835		
	(1,096,961)	(102,325)	(109,493)		
Log pseudolikelihood	−60,813.45	−5209.97	−3334.46		
Wald chi^2	216,369.38	18,994.39	14,105.56		

Notes: Exponentiated coefficients are presented; standard errors are in the parentheses.
Significance level: $^*P < 0.05$, $^{**}P < 0.01$, $^{***}P < 0.001$.