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Entrepreneurship Dynamics: Entry Routes, Business-Owner's Persistence and Exit Modes*

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Abstract

This paper conducts a comprehensive study on entrepreneurship dynamics using a large longitudinal matched employer-employee dataset. We identify the transition of over 200,000 nascent business-owners and follow their survival patterns in the respective businesses using discrete time competing risks models. Different profiles of new business-owners are identified, taking into account their entry routes and how such entry choices impact on their persistence in the firm. Exits by dissolution are distinguished from exits by ownership transfer. We also analyze how previous labor market experiences and macroeconomic environment shape the individuals' decision to become and persist as business-owners. Controlling for a set of individual and previous job characteristics, we found that those experiencing a recent displacement are more likely to become entrepreneurs and to persist longer in the business. Concerning macroeconomic conditions, nascent entrepreneurs entering via start-up enter counter-cyclically, while all other nascent business-owners behave in line with the "prosperity-pull" hypothesis. Business-owners' entry choices significantly affect their post-entry persistence and exit modes. Particular experiences in the labor market while paid employees are also found to significantly influence the way individuals enter into and exit from entrepreneurship.

Keywords: Entrepreneurship, Business Ownership, Entry, Exit
JEL Codes: J24, L26, M13

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1 Introduction

Economists have good reasons to care about entrepreneurship, either because it generates wealth, or because it may entail externalities – positive or negative, both having policy implications – or even because it may be an important source of labor market flexibility (Berglann et al., 2011). Moreover, the widespread belief that entrepreneurs are the engine of the market economy, by introducing new innovations, fostering economic growth and creating new jobs (Van Praag and Versloot, 2007), has motivated waves of government support around the world encouraging entrepreneurship and the creation of new businesses (e.g., Román et al., 2013). Actually, under the current context of economic crisis, the pivotal role of entrepreneurship as a way to reduce unemployment – particularly among the youth – has been recognized by several governments, especially in Europe (Congregado et al., 2010).

There is a considerable amount of scientific research on the decision to become an entrepreneur, with entrepreneurship corresponding to the start-up of a new venture, with or without employees (see Parker, 2009a). However, the entrepreneurial process consists of distinct activities, including – among others – opportunity identification, resource mobilization and the creation of an organization (Shane and Venkataraman, 2000), which does not exclusively correspond to establishing a start-up. In fact, starting a new firm is not the only way individuals can become entrepreneurs – they can also take over an existing firm. This distinction is relevant since different risk levels (Tarola et al., 2011; Tarola, 2012) and learning opportunities (Jovanovic, 1982) may be associated to each of those entry alternatives, and consequently shape the post-entry success of nascent business-owners. However, most of the literature has not yet recognized that the determinants of transition into entrepreneurship might be distinct for different entry routes (Parker and van Praag, 2010).

On the other hand, many policies have been focused on the necessity to "produce" more entrepreneurs, but not so much on the necessity to preserve the stock of entrepreneurs (European Commission, 2011). Data limitations have also forced most of the existing literature to leave out dynamic aspects of entrepreneurship and to focus solely on entry determinants, thus overlooking what happens after entry (Parker and Belghitar, 2006). Actually, despite that all entrepreneurs will eventually exit their firms, little research has hitherto documented this phenomenon or explained which factors may determine the length of time an individual remains in the business (DeTienne, 2010; DeTienne and Cardon, 2012). Besides, most of the studies on entrepreneurial survival have been framing entrepreneur's exit as firm exit, thus conceptualizing exit as a dichotomous event. However, entrepreneur's exit does not necessarily correspond to business failure and firm closure, as entrepreneurs can exit their business while the firm continues operating under the ownership of other entrepreneur(s). Even so, this reality has been barely recognized or addressed, both in theoretical and em-

pirical literature (Stam et al., 2010; DeTienne and Cardon, 2012).

Hence, this paper contributes to the existing literature in a number of ways. First, we use Quadros de Pessoal (henceforth, QP), a large longitudinal matched employer-employee administrative dataset that allows us to follow over 200,000 nascent entrepreneurs since the moment they enter until they leave the business (or until the end of the period covered by QP files).

Second, more than identifying transitions into entrepreneurship, we go beyond existing studies by taking into account the business-owner's entry mode, which allows the distinction between new business-owners entering via start-up and those entering by acquiring an existing business. Among these, we also distinguish between Entrepreneurs and Intrapreneurs.

Finally, we distinguish business-owners' exits by dissolution from exits by ownership transfer, and employ duration models with competing risks, accounting as well for individual-level unobserved heterogeneity – an issue frequently overlooked by previous studies – to analyze entrepreneur's persistence in the business.

In summary, this study addresses two main questions: first, how different determinants – namely related to previous experiences in the labor market and macroeconomic conditions – impact differently on individuals' entry decision according to the entrepreneurship entry route chosen; and, second, how such entry choices, labor market histories and macroeconomic conditions influence the business-owner's subsequent persistence in the business. In a time of severe economic crisis, when entrepreneurship is considered to be part of the solution towards job creation and industries' regeneration, it is more opportune than ever to understand how some particular determinants may shape the overall dynamics of entrepreneurship.

The remaining sections of the paper are structured as follows. Section 2 briefly presents prior findings of existing literature, both on entry into and exit from entrepreneurship. Section 3 describes the data, the methodological procedures to identify entrepreneurs' entry and exit, and the empirical strategy. The empirical results on entrepreneur's entry and survival in the business are presented and discussed in sections 4 and 5, respectively. Section 6 concludes.

2 Previous Research

An extensive literature has been treating the decision to become an entrepreneur as an occupational choice (Parker, 2009a). More recent research has been emphasizing the importance of several variables that may affect this decision, including numerous individual-level specificities (e.g., Livanos, 2009; Berglann et al., 2011), previous unemployment situations (e.g., Von Greiff, 2009), prior employer's characteristics (e.g., Hyytinen and Maliranta, 2008;

Parker, 2009b) and macroeconomic determinants (e.g., Koellinger and Thurik, 2012). The empirical evidence has, so far, presented mixed results on the effect of most of those variables. Hitherto, the most robust and consistent results regard individuals' gender and recent unemployment experiences – men are recurrently found to be more likely to become entrepreneurs than women (e.g., Earle and Sakova, 2000; Burke et al., 2002; Livanos, 2009), and those coming from a status of unemployment are also more prone to transit into entrepreneurship (e.g., Carrasco, 1999; Parker, 2009b; Von Greiff, 2009; Berglann et al., 2011).

This literature largely focuses on entrepreneurship as a transition into independent business ownership – frequently measured by transitions into self-employment with or without employees – and usually frames entrepreneurship in terms of a new venture creation. However, starting a new firm from scratch is not the only way individuals can get into entrepreneurship. Budding entrepreneurs can also take over an existing firm – including a family business if they come from a business-owning family (see Parker and Van Praag, 2010) – though very few studies have been concerned with this issue.

There are good reasons to believe that entrepreneurs entering via start-up differ from those entering by acquiring an existing business, or are differently driven by the same determinants. Acquisition can be viewed as a quick mode of penetrating a new market, besides allowing the potential entrant to take advantage of existing facilities, customer base and networks. In other words, established firms are less risky than brand new firms (Cooper and Dunkelberg, 1986) – which typically have more variable growth and profit rates and lower survival rates than established firms do (e.g., Van Praag, 2003; Parker, 2009a). At the opposite, those who decide to install a new venture are faced with time-consuming and risk-taking activities, like building plants, learning the market or training employees (Tarola et al., 2011; Tarola, 2012). Also, problems of asymmetric information are more acute in new venture start-ups compared with established firms, which can be acquired by an outside investor or even by one of the firm's employees (Parker and Van Praag, 2010).

In summary, despite entering entrepreneurship by establishing a new start-up firm may entail greater risks, it also provides the new business-owner with richer opportunities to learn about the whole entrepreneurial process and his/her entrepreneurial ability, since entrepreneurs and firms learn – and update their behavior – with experience (Jovanovic, 1982). Accordingly, entrepreneurial entry should not be understood as a homogeneous phenomenon, as different entry routes may signal different profiles of business-owners. Despite most of the research on entrepreneurial entry has overlooked this question, a few recent studies actually show that the mode of entry into entrepreneurship is influenced by individual characteristics of the entrepreneur, as human, social or financial capital (see Block et al., 2010; Parker and Van Praag, 2010; Bastié et al., 2013). Even so, we still lack substantial knowledge on other types of determinants, as those related with individuals' past experiences in

the labor market or macroeconomic conditions.

In what concerns entrepreneurial exit, this has been a topic systematically disregarded in many studies, not only due to data limitations, but also because a great part of the entrepreneurship literature suggests that the entrepreneurial process is complete when the new venture is created (DeTienne, 2010). However, the entrepreneurial process is more than just the creation (or acquisition) of a business and does not end with entrepreneur's entry, but rather with entrepreneur's exit.

Even so, empirical research has primarily examined firm exit rates based on Industrial Organization approaches, widely considering entrepreneurial exit to be tantamount to failure (DeTienne and Cardon, 2012). More recent research has been redirecting the attention to the entrepreneur in particular and – whenever available data permit – trying to fill this gap by searching for potential explanations on why some entrepreneurs survive longer in the business than others. Entrepreneurs' individual characteristics such as age, gender and education (e.g., Block and Sandner, 2009), their past experiences in unemployment (e.g., Carrasco, 1999; Taylor, 1999; Andersson and Wadensjö, 2007), some characteristics of their businesses (Parker and Belghitar, 2006; Stam et al., 2010) and the overall environment (e.g., Haapanen and Tervo, 2009; Millán et al., 2010) are some of the determinants that have been found to affect the length of time an individual persists as an entrepreneur in the same firm. So far, the most consistent conclusions obtained by previous studies concern individual's gender and education – men and more educated entrepreneurs are commonly found to survive longer in their businesses, facing lower exit rates (e.g., Parker and Belghitar, 2006; Block and Sandner, 2009; Haapanen and Tervo, 2009; Millán et al., 2010). For other variables, the evidence is still limited and mixed.

However, despite the increasing recognition that exit is not always a negative outcome (see Wennberg et al., 2010; Yusuf, 2011), only a few studies distinguish between different exit modes for entrepreneurs (e.g., Taylor, 1999; Stam et al., 2010). Most of the existing studies conceptualize exit as a complete exit of both the firm and the entrepreneur. Besides – given that few studies have distinguished between alternative entry routes, and the few valuable exceptions disregard what happens after entrepreneurial entry – we still know little about how entry choices may impact on entrepreneurial survival.

In view of that, this study adds to the current literature by conducting a comprehensive analysis of entrepreneurship dynamics, distinguishing between different profiles of business-owners as regards their entry routes and exit modes. Intrapreneurs – about whom most of the literature on entrepreneurial entry has remained silent (see Parker (2011) and Martiarena (2013) as valuable exceptions) – are separated from Entrepreneurs, who are also distinguished according to their mode of entry (start-up or acquisition). Regarding business-owners' post-entry persistence and exit, we also extend the current literature stream by

distinguishing between two different exit modes: exits by dissolution – which may be understood as a forced exit, due to bankruptcy – and exits by ownership transfer (when the entrepreneur decides to leave the business, but the firm continues its operations, thus signaling a more voluntary exit).

Finally, it is worth noticing that in this paper we focus on nascent entrepreneurs. Even though some studies on entrepreneurial exit frequently use samples of both nascent and serial entrepreneurs (e.g., Taylor, 1999; Haapanen and Tervo, 2009; Millán et al., 2010; Oberschachtsiek, 2012), serial entrepreneurs are documented to be significantly different than nascent entrepreneurs (e.g., Hyytinen and Ilmalkunnas, 2007; Plehn-Dujowich, 2010), so they may also be dissimilar in their exit patterns. Consequently, we leave those experienced entrepreneurs out from our current analysis.

3 Data and Methodological Issues

3.1 Data

In this study, we use data from QP, a matched employer-employee administrative dataset from the Portuguese Ministry of Employment. QP is an annual mandatory employment survey that all firms in the private sector employing at least one wage earner are legally obliged to fill in. Requested data cover the establishment (location, employment and economic activity), the firm (location, employment, sales, economic activity, ownership, number of establishments and legal setting) and each of its workers (gender, age, education, qualifications, occupational category, employment status, earnings, tenure and hours of work).

All firms, establishments and workers entering QP dataset have a unique identification number. Data are available for the period 1986-2009. Owing to the longitudinal dimension of the dataset, we can track firms/establishments and workers over time and match workers with their respective employers. Thus, the longitudinal nature of the dataset, besides its high degree of coverage and reliability, makes QP a suitable database for a comprehensive study on entrepreneurship dynamics.

For the years 1990 and 2001, data on workers are not available. As this missing data poses some limitations in the identification of individuals' transition into entrepreneurship, we have restricted our analysis to all first time transitions into entrepreneurship occurring during the period 1992-2007, excluding 2001 and 2002.[1] Data for the period 1986-1991 was

[1] We restrict our analysis to transitions occurring from 1992 onwards, because we need data on the year prior to transition to verify where each worker comes from. For the same reason, we have to exclude from our analysis all the transitions occurring in 2002. Besides, we exclude transitions occurring after 2007 because, given the criteria adopted to identify business-owners' exits (section 3.3), we need at least two years of available information after they enter to clearly identify their exit from the firm.

only used to characterize workers' past experiences in the labor market.

We have also to deal with two other limitations of QP data. First, self-employed individuals without employees are not covered by QP, as the survey is mandatory only for firms employing at least one paid employee. Accordingly, the entrepreneur definition used in this study corresponds to Business-Owners (BOs) of firms with at least one wage earner (i.e., employers). Second, exits of workers from the dataset are possible, but we are not able to precisely identify the reason for these absence periods. They may correspond to periods of unemployment, inactivity, self-employment without employees, or transitions into the public sector. We will adopt particular procedures in order to better identify some of these cases, as we detail later.

3.2 Identifying transitions into entrepreneurship

We started by working with raw data files covering the period 1986-2009. Workers were classified according to their employment status at each moment in time: Business-Owner (BO) or paid employee.[2] We tracked each worker in the dataset in order to identify the first year s/he appeared as BO. Individuals who are never registered as BOs during the whole period covered by QP were classified as "Never BOs". They correspond to our control group for the analysis of predictors of transitions into entrepreneurship.

For those workers who, at some point in time, become BOs, we have followed them in the dataset until the moment of their first time transition, in order to identify where they come from. During this procedure, we have identified three main cases:

- Individuals whose first record in QP corresponds to the first time they appear as BOs were classified as "Born BOs". It is not possible to follow these individuals in the labor market before their first transition into entrepreneurship. They may correspond either to individuals who have never been in paid employment before (at least, in the private sector), or to individuals who were self-employed without employees for some time, or even individuals who were unemployed or inactive for a long time period.[3]

- Individuals who were paid employees in a particular firm and become BOs within the same firm were classified as "Nascent Intrapreneurs".[4]

[2] We restrict the analysis to workers aged between 16 and 65 years old.

[3] Even so, taking into account the average age of these individuals (41 years old), as well as the average age of the firms established by them (9 years), we suspect that most of Born BOs do not correspond to individuals entering in the labor market for the first time, but rather to individuals who were self-employed for some time without paid employees. The distribution of Born BOs' age confirms this expectation: less than 9% are aged below 25 years old, about 25% of them are aged between 26 and 35 years old, 28% belong to the [36-45] age cohort and 38% are older than 45 years old.

[4] The literature has been using the terms Intrapreneurship, Corporate Entrepreneurship and Corporate

- Individuals who were previously identified in paid employment and who become BOs in a different firm were classified as "Nascent Entrepreneurs".[5]

Among these Nascent Entrepreneurs, we still identify two subgroups, according to the way they enter into entrepreneurship:[6]

- If the firm's first record in QP files coincides with the individual's year of transition into entrepreneurship, the Entrepreneur enters via start-up (i.e., by establishing a new firm "from scratch") and is classified as a "Start-up Entrepreneur".
- If the individual becomes a Nascent Entrepreneur in a pre-existing firm, the Entrepreneur enters via takeover (i.e., by acquiring an already established firm) and is classified as an "Acquisition Entrepreneur".

Overall, we identified a total of 425,803 records of first time BOs.[7][8] From these, 219,436 transitions corresponded to Born BOs, about whom we do not have information on their past experiences in the labor market. As these variables are crucial to our analysis, we have decided to exclude them from this study and focus on the remaining 206,367 transitions identified (89,904 Start-up Entrepreneurs; 43,582 Acquisition Entrepreneurs and 72,881 Intrapreneurs).[9]

Venturing interchangeably, commonly referring to the practice of developing a new venture within an existing organization (see Parker, 2011; Martiarena, 2013). We use a wider definition of Intrapreneurship in this study: a worker becomes an Intrapreneur if s/he becomes the BO of the firm where s/he was already employed (Employee Buyout), or enters the ownership of the business and becomes one of the BOs of the employer firm (Partnership). A significant share of these transitions into Intrapreneurship probably corresponds to ownership transfers within family firms. Unfortunately, QP data do not allow the identification of family businesses in particular.

[5] However, they may have suffered a period of unemployment between the moment they leave the previous firm as paid employees and the year they transit into entrepreneurship. We adopt particular procedures, to be explained in section 4.2.2, to identify these cases.

[6] We do not make such a distinction for Nascent Intrapreneurs because, by definition, all Intrapreneurs enter by acquisition.

[7] Regarding the juridical nature of new BOs' firms, the great majority of them are either limited liability companies (*Sociedades por Quotas*) or one-person business (*Empresário em Nome Individual*).

[8] During the identification of transitions, we have also identified a residual group of individuals who become BOs, in the same year, in two or more different firms (portfolio BOs). Such multiple entries could include both start-up and acquisition experiences, or simultaneous entrepreneurship and intrapreneurship transitions, which complicates any attempt of classification of these transitions into the groups of BOs previously identified. Given the relative few number of such multiple transitions (less than 1% of the total number of transitions identified for the period 1992-2007), we also prevented ourselves to extend the analysis in order to classify these "portfolio BOs" into an independent group of nascent BOs. For this reason, we have excluded these multiple simultaneous transitions from the current analysis.

[9] Nevertheless, as a robustness check, and whenever possible, we have performed all the analyses on entry and exit determinants also including "Born BOs" in our estimations. The results were not found to be significantly changed by their exclusion from the analysis and are available upon request from the authors.

3.3 Identifying Business-Owner's and firm's exits

In order to accurately identify BOs' exit year, we have required an absence of the BO from the firm (or from the BO category) larger or equal to two consecutive years.[10] To identify firms' exit year, following the procedures of previous studies also using QP data (e.g., Blanchard and Portugal, 2001; Portugal and Cardoso, 2006), we use all the subsequent spells of the data. Thus, a firm is classified as an exiting firm in year t if it is present in QP files in year $t-1$, but absent in t and in all the subsequent years. These criteria explain why we restrict our analysis of entrepreneurship dynamics to transitions occurring during the period 1992-2007. Data for 2008 and 2009 were only used to check the presence/absence of each BO in the respective firm(s), as well as the presence/absence of each firm in QP files.

Each of the 206,367 new BOs previously identified was then tracked over time, since the year of entry until his/her respective last record as BO in the firm, which may correspond to the year of BO's exit or, alternatively, to the last year we have information about the individual. This last case – when an individual persists as BO in the same firm until the end of the period under study – corresponds to a right-censored case (Singer and Willett, 1993; Hosmer et al., 2008). In our data, the duration of a BO's spell (i.e., the individual's survival time as BO within the same firm) may vary between 1 and 16 years.[11]

Finally, besides identifying BOs' exits, we furthermore distinguish amongst two alternative exit modes – exit by dissolution (firm closure) versus exit by ownership transfer. In the former case, the BO's exit year coincides with firm exit year. Exit by ownership transfer, in turn, is defined as the BO's exit from a firm (or from the BO status in a firm) that continues operating in the market after such exit.

[10] Actually, temporary exits from the dataset may occur for a number of reasons, a very likely reason being that the survey form was not received in the Ministry of Employment before the date when the recording operations were closed. Temporary absences of one year (like those of BOs "alive" in 2000 and 2002, but absent in 2001 due to the gap in the dataset) were, therefore, not classified as definitive exits of the BO. Such temporary exits were easily filled in, as most of the variables to be included in the empirical analysis are time-invariant. For time-varying variables (e.g., individual's age, firm size) the reconstruction of those particular missing records was not problematic. For the sake of consistency, we have excluded from our database those entrepreneurs who were temporarily absent from the same firm for two or more years. On the one hand, these absence periods may have corresponded to periods of self-employment without employees, so they should not be considered as real exits. On the other hand, we prevented ourselves from filling individual-level gaps larger than one year. As a result, we restrict our analysis on entry and exit to those BOs with complete spells, since their entry year until they leave the firm or until the end of the period covered by QP.

[11] Maximum survival time (16 years) corresponds to those individuals who became BOs in 1992 and persisted as BOs in the same firm until 2007. In the other extreme, the minimum survival time (1 year) corresponds to those individuals who became BOs in year t and are no longer observed as BOs in the same firm in the subsequent years.

3.4 Empirical Strategy

3.4.1 The choice of becoming a BO

To study which factors may influence the decision of transiting into entrepreneurship and becoming a BO, we use discrete choice models. Following the literature on entry into entrepreneurship, the analytical framework used to identify the drivers of such decision is that of random utility, according to which an individual will transit into entrepreneurship if the expected utility of becoming a BO exceeds the expected utility of the other alternatives.

According to prior empirical evidence, several determinants are expected to affect the decision of becoming a business-owner (see, for instance, Uusitalo, 2001; Lazear, 2004; Hyytinen and Maliranta, 2008; Livanos, 2009; Parker, 2009b). In this study, we focus on the effect of previous experiences of the individual in the labor market while paid employee – namely related to employment experiences in large-sized and foreign-owned firms, job shifts between different employers and recent displacement events – and macroeconomic conditions.

However, some of these factors may affect individual's choice in a different way, depending on the type of BO they become. From previous sections, we know that individuals face several different alternatives when deciding to transit into entrepreneurship and become BOs for the first time – not only regarding the entry mode (start-up versus acquisition), but also regarding the firm where the transition occurs (in the same firm where the individual is already employed or in a different firm). Accordingly, we estimate a multinomial logit model, where the outcome y for individual i may be one of four alternatives: 1) Never BO; 2) Start-up Nascent Entrepreneur; 3) Acquisition Nascent Entrepreneur; or 4) Nascent Intrapreneur. Thus, and assuming extreme value independent and identically distributed (i.i.d.) error terms, the probability that the outcome for individual i is alternative j, conditional on a vector of variables X_i is

$$p_{ij} = \frac{e^{x_i^{'}\beta_j}}{\sum_{l=1}^{4} e^{x_i^{'}\beta_l}}, j = 1, ...4. \quad (1)$$

Vector X_i, besides including the variables related to previous experiences in the labor market and macroeconomic conditions, also includes several variables regarding individual-level characteristics (in particular, individuals' gender, age and education) and a number of characteristics of the previous employer and the previous job before transition (e.g., previous employer size and sector, tenure in the previous job, previous wage and management experience, among others). See the Appendix for a detailed description of these variables. In our estimations, Never BOs are used as the reference group for the transitions occurring

in each year. As observations for the same individual are likely to be correlated over time, all estimations were performed with cluster-robust standard errors, clustered on the individual.

3.4.2 The persistence and the exit of the BO

The analytical framework typically used to explain entrepreneur's exit is somehow similar to that used when explaining entrepreneur's entry. According to simple occupational choice models, like that presented by Frank (1988), an individual currently in business as an owner has to decide whether to continue in business or cease. BOs are considered to learn more about their "ability" or "talent" to run a firm the longer they remain in business (Jovanovic, 1982). So, every period, as rational agents, they adjust their expectations of the potential outcomes (or, more generally, gains) that can be obtained from a set of exiting options.

Accordingly, we rely on duration models, which provide a dynamic framework that addresses the inability of static binary choice models to take into account right-censoring issues and those *learning effects* of BOs over time. We started by estimating a single risk hazard model to study the effect of a set of determinants on BOs' persistence. Over again, we focus on the effects arising from BOs' previous experiences in the labor market while paid employees and macroeconomic conditions, in addition to the BOs' entry mode. Individual-level characteristics and several characteristics of BOs' firms (namely size, sector, age and location) are also taken into account in our estimations (see the Appendix for a detailed description of these variables). We then estimate a competing risks model where BO's exit decision is allowed to assume one of two independent alternatives – business dissolution or ownership transfer.

As survival spells are recorded in an annual basis, discrete time duration models were considered. The length of each individual's spell as BO (T_i) is therefore assumed to be a discrete non-negative random variable. Moreover, we go beyond most of the previous research on entrepreneurial survival using discrete hazard models (e.g., Carrasco, 1999; Taylor, 1999; Nziramasanga and Lee, 2001; Block and Sandner, 2009; Millán et al., 2012; Oberschachtsiek, 2012) by incorporating the effect of unobserved heterogeneity, which is known to mainly affect the influence of time dependence on the transition rate (e.g., Heckman and Singer, 1984; Lancaster, 1990; Jenkins, 2005).

We observe BO i's spell from period $j = 1$ (corresponding to the year of first time entry as BO) through to the end of the j^{th} period, at which point i's spell is either complete ($c_i = 1$) or right-censored ($c_i = 0$) (flow sample). To estimate the discrete time single-risk model, the discrete interval hazard rate – that is, the probability of exit at discrete time t_j, $j = 1, 2, \ldots$, given survival until time t_j – can be defined as

$$h_{ij} = \Pr(T_i = j | T_i \geq j) = F(\gamma(t) + X_i^{'}(t)\beta + \varepsilon_i), \tag{2}$$

where h_{ij} is the probability of individual i persisting as BO in the firm for exactly j years; $\gamma(t)$ describes the pattern of duration dependence (the baseline hazard); $X_i(t)$ is the vector of time dependent and independent variables; β is a vector of unknown parameters to be estimated; ε_i is a disturbance term that includes the time-invariant unobserved heterogeneity (the individual-specific effect) and that is assumed to be uncorrelated with the observable variables of vector $X_i(t)$ (Jenkins, 1995; Cameron and Trivedi, 2005: 613); and, finally, $F(\cdot)$ denotes the complementary log-logistic distribution function.

We do not impose any functional form for $\gamma(t)$. We instead estimate a piecewise constant hazard model, where exit rates are assumed to be constant within each interval (year) but different between intervals. Thus, in order to estimate the full set of γ's, we have added an indicator variable per duration time t to the model. This flexible (non-parametric) modeling has been recognized to be preferred in order to avoid serious misspecifications. Moreover, such hazard formulation with a flexible baseline hazard function makes an attractive model with which to combine a specific heterogeneity assumption (Cameron and Trivedi, 2005: 620). Accordingly, following usual conventions (e.g., Hougaard, 1995; Jenkins, 2005), we assume an Inverse Gaussian distribution for the unobserved heterogeneity term, so that ε_i is normally distributed with zero mean and unitary variance.

Summing up, the discrete time hazard function in (2), to be estimated under a cloglog model with Inverse Gaussian unobserved heterogeneity, may be rewritten as follows:

$$h_{ij} = 1 - \exp\{-\exp[\gamma(t) + X_i(t)'\beta + \log(\varepsilon_i)]\}. \tag{3}$$

We then extend the above model to take into account independent competing risks, in order to distinguish between the two alternative exit modes available to each BO. Following the procedures of some previous studies (e.g., Carrasco, 1999; Reize, 2000; Georgarakos and Tatsiramos, 2009), the parameters of a given state-specific hazard are estimated by single-risk methods, by treating durations finishing in other states as right-censored at the point of completion (Jenkins, 1995; 2005).[12]

[12] Narendranathan and Stewart (1993) show that, if distinct destination states depend upon disjoint subsets of parameters - which are functionally independent (so far as the inference about $\gamma_j(t)$ and β is concerned) - the parameters of a state-specific hazard can be estimated by treating durations finishing into other states as censored at the time of exit. However, if the unobserved characteristics are common to or correlated across the states, this simplification may have an effect on the overall hazard rate. Even so, this is a minor issue in our analysis, as we mainly concentrate on state specific hazards, rather than on the overall rate. Nevertheless, as a robustness check, we have alternatively estimated a multinomial logit model, and the results were not significantly different than those obtained with competing risks model. Given the complexity of incorporating unobserved heterogeneity into multinomial logit models, we prefer to focus on

4 Empirical Results on Entry

4.1 Preliminary Statistics

In Table 1, we briefly characterize the different types of BOs identified in the data, as well as the control group composed by Never BOs. The variables listed in the Table correspond to the vector of variables included in the estimation of the multinomial logit model described in section 3.4.1.[13]

Regarding the key variables of interest, Never BOs had more frequently a past employment experience in a large-sized firm. For Nascent Intrapreneurs, in contrast, past experiences in large or foreign-owned firms were much less common. Both types of Nascent Entrepreneurs seem to have wider and more diverse past experiences as paid employees, by having been employed in a larger number of different firms. Recent job losses (caused by previous employer's closure or downsizing – see section 4.2.2 for details), were also more frequently suffered by those transiting into Entrepreneurship, especially among those entering via Start-up.

Data also show a larger proportion of males, as well as a larger share of individuals with higher educational attainment, among those who became BOs. Nascent Intrapreneurs are, on average, the oldest group of individuals, while Start-up Entrepreneurs are the youngest ones. Education-job mismatches, captured by overeducation in the previous job, were also more evident among those transiting into business-ownership.[14] Notable differences are also found regarding previous management positions, which were more frequently occupied by workers becoming Nascent Intrapreneurs.

Finally, on average, those transiting into business-ownership in general come from smaller firms with lower participation of foreign capital. This is particularly evident among Nascent Intrapreneurs. Concerning the location and the sector where individuals were previously employed, the differences between groups seem to be less remarkable. Nonetheless, when

the results obtained from duration models in the paper. Likewise, alternative estimations using the model proposed by Fine and Gray (1999) did not produce qualitatively different results from those obtained by estimating cause-specific hazard functions with unobserved heterogeneity. However, over again, given the lack of available programs allowing the introduction of unobserved heterogeneity in this model, we decided to not present the results in the paper. Even so, all these results are available upon request from the authors.

[13] Additionally, estimation also includes the variable *Lagged Unemployment Rate* (with one-year lag), to take into account potential effects of the business cycle. Time dummies are also included in all estimations.

[14] Using one of the three most conventional ways of measuring overeducation (see, for instance, Kiker et al., 1997), an individual was considered to be overeducated if s/he had an educational attainment higher than the mode of the educational attainment of recently hired workers in the same occupation (according to the 3-digit International Standard Classification of Occupations) in the same year. These comparisons were performed after converting both the years of schooling of the individual and the mode of years of schooling in the respective occupation in categories of educational attainment (namely into 4, 6, 9, 12 years of schooling, plus college education).

compared to Never BOs, those becoming BOs were more commonly employed in services and less in manufacturing.

Table 1. Descriptive statistics, by groups of Nascent BOs (Portugal, 1992-2007)*

	Never BOs	Start-up Entrepreneur	Acquisition Entrepreneur	Intra-preneur
(Number of cases)	(5,484,866)	(89,904)	(43,582)	(72,881)
Prior experiences in the labor market as paid employee				
Experience in a Large Firm (%)	0.340	0.241	0.275	0.117
Experience in a Foreign Firm (%)	0.120	0.118	0.124	0.060
Number of different employers	1.749	2.880	2.800	1.734
Recent displacement (%)	0.024	0.163	0.086	N.A.
Previous wage job characteristics				
Overeducation (%)	0.305	0.392	0.367	0.407
Tenure (months)	93.692	57.569	68.591	62.409
Management position (%)	0.024	0.047	0.054	0.253
Hourly wage (€, 2005 constant prices)	4.157	4.401	4.674	4.586
Foreign Firm (%)	0.091	0.062	0.070	0.014
Micro Firm (%)[a]	0.202	0.384	0.310	0.674
Small Firm (%)	0.273	0.320	0.316	0.247
Medium Firm (%)	0.242	0.171	0.204	0.063
Large Firm (%)	0.283	0.125	0.170	0.016
Urban Location (%)	0.527	0.498	0.538	0.449
Primary Sector (%)	0.025	0.017	0.023	0.029
Manufacturing (%)[a]	0.336	0.269	0.296	0.234
Energy & Construction Sectors (%)	0.118	0.129	0.113	0.122
Services Sector (%)	0.521	0.585	0.568	0.615
Individual-level characteristics				
Male (%)	0.573	0.687	0.642	0.641
Age (years)	36.505	32.465	34.050	37.849
Less than 9 years of schooling (%)[a]	0.628	0.515	0.543	0.539
9 years of schooling (%)	0.135	0.181	0.168	0.161
12 years of schooling (%)	0.162	0.200	0.176	0.173
College education (%)	0.075	0.104	0.113	0.127

*Excluding 2001 and 2002. N.A.: Not Applicable. [a]Variables used as reference categories in estimations.

4.2 Empirical Results

4.2.1 Multinomial Logit Estimation Results

Table 2 reports the results for the final specification of the multinomial logit model, including all variables presented in Table 1 (except *Recent Displacement*)[15], as well as *Lagged Unemployment Rate*. After the estimation of this specification, we tested whether some of the different types of BOs under consideration could be pooled together into a common category. A Wald test – under the null hypothesis of equalizing the estimated coefficients associated with any given pair of outcomes or choices – strongly rejects the pooling of any of these categories of BOs. Therefore, these groups of BOs must be analyzed separately.[16]

Regarding the role of past experiences in the labor market, results show that different experiences push individuals towards different entry routes when considering becoming BOs. A past experience while paid employee in a large or in a foreign company reduces the individuals' propensity to leave paid employment and become Entrepreneurs, regardless their mode of entry (start-up or acquisition). Such experiences in the labor market – being typically appreciated by subsequent employers (e.g., Sørensen, 2007; Sørensen and Phillips, 2011) – may increase by more the individual's expected utility of remaining in paid employment than that obtained by switching into entrepreneurship. In contrast, a labor experience in a foreign-owned firm in the past significantly increases workers' transition into Intrapreneurship, suggesting that workers who have accumulated knowledge from foreign companies may have a better career progress inside subsequent firms (Balsvik, 2011).

The diversity of experiences in the labor market also matter, as a larger number of job shifts in the past is found to increase (decrease) individuals' propensity to become Entrepreneurs (Intrapreneurs). If, on the one hand, workers' mobility across different firms may work as a mechanism for knowledge transfers, accumulation of skills and resources (e.g., specific knowledge and networks) that induce them into entrepreneurship (Lazear, 2004; Frederiksen and Wennber, 2011), on the other hand, a larger number of different jobs may signal individual's greater instability in the labor market, which may motivate the

[15] Given that, by definition, Nascent Intrapreneurs never suffer a job loss prior to their transition, we cannot include this variable in the estimation. Otherwise, the model would suffer from identification problems. We study the effect of recent displacement experiences in section 4.2.2, after excluding Nascent Intrapreneurs from the estimation of the extended model.

[16] Additionally, we have also tested the validity of the Independence of Irrelevant Alternatives (IIA), one strong assumption of multinomial logit models. This assumption is less of a problem when the alternatives are reasonably distinct (Amemiya, 1981), like in this case. The fact that, according to the Wald test, we are unable to combine any pair of choices emphasizes the dissimilar structure of the alternatives under study. Even so, we have performed a series of Hausman tests, by sequentially omitting each of the categories of BOs from the choice set and re-estimating the model of Table 2, and then comparing the results from the full model and the several restricted models. We do not obtain systematic evidence to reject the IIA assumption.

transition into Entrepreneurship as a solution for the lack of (stable) alternatives in paid employment. Both effects may have actually taken place in the identified transitions into Entrepreneurship.

Taking into account some specificities of the last job prior to transition, education-job mismatches related to overeducation phenomena – by potentially signaling some under-utilization of workers' knowledge and skills, and consequently, some dissatisfaction of workers with their jobs (Allen and van der Velden, 2001; Flemming and Kler, 2008) – are also significantly associated to the decision of leaving paid employment towards business-ownership. Workers engaged in management positions in the previous job are more likely to become BOs than those in other occupations.

In addition, our results consistently confirm that smaller firms spawn new entrepreneurs among their employees more often than larger firms do (Hyytinen and Maliranta, 2008; Parker, 2009b; Berglann et al., 2011). Large-sized firms, instead, by offering better opportunities for the development of internal labor markets (Brown and Medoff, 1989), reduce the workers' incentive to leave and become BOs. For Intrapreneurs in particular, results show that both firm size and foreign ownership play a negative effect on their transition, confirming that Intrapreneurship (as we define it) is more common within very small domestic firms – thus, the typical family firm. Transitions into business-ownership seem to be less likely for those who were previously employed in large urban centers, apart from those becoming Acquisition Entrepreneurs, who may have created networks and contacts, and accumulated knowledge on specific markets during the previous job, which may help them to find great acquisition targets.

Regarding the several individual characteristics that we control for, results are in line with previous literature showing that men are more prone to become BOs than women (e.g., Uusitalo, 2001; Livanos, 2009; Parker, 2009b). Individual's age, in turn, plays different effects according to the type of transition – as workers become older, they are more likely to become Intrapreneurs and less likely to become Entrepreneurs. Education is also associated with a greater likelihood of transiting into business-ownership, in line with the argument that education enhances individuals' managerial ability and "entrepreneurial talent" (Lucas, 1978; Calvo and Wellisz, 1980), improving as well individuals' efficiency at assessing new business opportunities (e.g., Carrasco, 1999).

Table 2. Multinomial Logit Estimation Results (Portugal, 1992-2007)[a]

	Start-up Entrepreneur	Acquisition Entrepreneur	Intrapreneur
Prior experiences in the labor market as paid employee			
Experience in a Large Firm	-0.5491***	-0.5166***	-0.1060***
	(0.0099)	(0.0130)	(0.0154)
Experience in a Foreign Firm	-0.1838***	-0.1784***	0.0661***
	(0.0122)	(0.0163)	(0.0201)
Number of different employers	0.7800***	0.7857***	-0.0412***
	(0.0028)	(0.0036)	(0.0053)
Previous wage job characteristics			
Overeducation	0.0699***	0.0281**	0.3264***
	(0.0082)	(0.0116)	(0.0098)
Tenure	0.0072***	0.0071***	-0.0021***
	(0.0002)	(0.0002)	(0.0002)
Tenure squared/100	-0.0012***	-0.0011***	0.0003***
	(0.0001)	(0.0001)	(0.0001)
Management Position	0.7019***	0.7474***	2.9828***
	(0.0206)	(0.0279)	(0.0149)
Hourly wage	0.0029***	0.0028***	-0.0073***
	(0.0006)	(0.0006)	(0.0073)
Foreign Firm	-0.0139	-0.0113	-0.9769***
	(0.0149)	(0.0198)	(0.0354)
Small Firm[b]	-0.5328***	-0.3554***	-1.2767***
	(0.0089)	(0.0133)	(0.0104)
Medium Firm[b]	-0.9702***	-0.6431***	-2.5138***
	(0.0110)	(0.0154)	(0.0178)
Large Firm[b]	-1.2098***	-0.7715***	-4.1008***
	(0.0128)	(0.0169)	(0.0344)
Urban Location	-0.0182**	0.0737***	-0.0376***
	(0.0079)	(0.0113)	(0.0094)

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Table 2. Multinomial Logit Estimation Results (Portugal, 1992-2007)[a]

(cont.)	Start-up Entrepreneur	Acquisition Entrepreneur	Intrapreneur
Previous wage job characteristics (cont.)			
Primary Sector[c]	-0.3819***	-0.0920**	-0.3720***
	(0.0303)	(0.0378)	(0.0288)
Energy & Construction Sectors[c]	-0.0710***	-0.1227***	-0.1650***
	(0.0130)	(0.0189)	(0.0162)
Services Sector[c]	0.0712***	0.0385***	-0.1130***
	(0.0094)	(0.0131)	(0.0116)
Individual-level characteristics			
Male	0.5330***	0.2675***	0.2608***
	(0.0084)	(0.0116)	(0.0100)
Age	-0.0604***	-0.1196***	0.1247***
	(0.0030)	(0.0039)	(0.0029)
Age squared/100	-0.0100**	0.0970***	-0.1344***
	(0.0041)	(0.0050)	(0.0037)
Educ9[d]	0.5097***	0.3173***	0.3779***
	(0.0115)	(0.0162)	(0.0138)
Educ12[d]	0.4870***	0.3419***	0.3392***
	(0.0109)	(0.0157)	(0.0141)
College Education[d]	0.9155***	0.8882***	0.4580***
	(0.0160)	(0.0224)	(0.0210)
Macroeconomic Environment			
Lagged Unemployment Rate	0.1217***	-0.0953***	-0.1861***
	(0.0071)	(0.0087)	(0.0053)
Constant	-6.7727***	-5.3732***	-6.5002***
	(0.0724)	(0.0886)	(0.0628)
Time Dummies	YES	YES	YES
N		26,492,214	
Log Pseudo-likelihood		-108336,8	
Pseudo R^2		0.1285	

NOTES: *, ** and *** denote significant at 10%, 5% and 1%, respectively. Standard errors (in brackets) are clustered at the individual-level. [a]Excluding 2001 and 2002. [b]Micro Firms are used as the base category for firm size. [c]Manufacturing Industry is used as the base category for sector. [d]An indicator variable for "less than 9 years of schooling" is used as the base category for individual's education.

Finally, different types of nascent BOs seem to respond heterogeneously to macroeconomic environment. Nascent Intrapreneurs are found to enter pro-cyclically – the better the economic conditions, the greater will be their likelihood of becoming BOs of the employer firm (either through Employee Buyout or Partnerships). Acquisition Entrepreneurs are also found to be blocked by more adverse conditions, as macroeconomic instability tends to reduce the processes of ownership transfer and firm acquisition hazards (see Bhattacharjee et al., 2009). For these two groups of BOs, we find support for the so-called "prosperity-pull" hypothesis (Evans and Leighton, 1990; Carrasco, 1999; Parker, 2009a: 143-144). In contrast, Nascent Entrepreneurs entering via start-up are more likely to transit into entrepreneurship when economic conditions worsen, in line with the "recession-push" hypothesis.

These results suggest that different motivations may propel individuals' first time transition into business-ownership, as well as the way they choose to become BOs. While some individuals may decide to run their own business due to the lack of better alternatives in the labor market (being thus nascent BOs of a more pushed-nature), others may decide to become BOs owing to the identification of a great business opportunity or of a better alternative to paid employment (being more driven by pulled-nature determinants). Accordingly, an additional important driver that may contribute to explain such transitions may be a recent job loss. We extend the analysis in the next subsection so as to evaluate how recent unemployment experiences might have influenced the entry of individuals into Entrepreneurship.

4.2.2 The effect of recent unemployment experiences

We now evaluate how recent individual unemployment experiences may affect transitions into entrepreneurship, by extending the previous estimated model with the inclusion of an indicator variable – *Recent Displacement* – accounting for recent displacement events. In QP dataset, if a worker is temporally absent from the annual records, it is not certain that s/he is unemployed.[17] To overcome this limitation, we have tracked each individual in the two years preceding the year of potential transition (i.e., $t-1$ and $t-2$), so as to identify a recent displacement event. For a worker to be classified as displaced, we have imposed that i) s/he leaves the previous firm (i.e., after her/his last record in the firm, the worker is no longer observed in that firm until the end of the period under study); and ii) the firm simultaneously suffers a process of downsizing (larger or equal to 30% of its workforce)[18] or

[17] Exits of workers from the QP files may occur if the individual becomes unemployed, inactive (out of the labor force), self-employed or due to transitions to the public sector.

[18] This threshold of 30% is a standard criterion in the literature to identify firm downsizing (e.g. Jacobson et al., 1993).

shut downs, thus exiting the dataset. So, if the last record of the worker (in $t-1$ or $t-2$) fits these criteria, the individual is considered to be recently displaced in t.

In Table 3, we summarize the results obtained from the extended model. Results show that recent displacement experiences significantly increase the probability of becoming a Nascent Entrepreneur. Moreover, the effect is noteworthy for those becoming Entrepreneurs by establishing a start-up business. Results, thus, corroborate the belief that entrepreneurship is frequently chosen as a (maybe temporary) solution for individuals' unemployment and insecurity in the labor market (Carrasco, 1999; Uusitalo, 2001; Georgarakos and Tatsiramos, 2009; Berglann et al., 2011). Hence, evaluating the effect of a recent displacement on individuals' persistence in entrepreneurship is equally important, and we pay particular attention to this issue in Section 5.

Table 3. The effect of a recent displacement on the transition into entrepreneurship

	Start-up Entrepreneur	Acquisition Entrepreneur
Recent displacement	1.3798***	0.6533***
	(0.0113)	(0.0195)
Prior experiences in the labor market as paid employee	YES	YES
Previous wage job characteristics	YES	YES
Individual-level characteristics	YES	YES
Macroeconomic Environment	YES	YES
N	26,419,333	
Log Pseudo-likelihood	-747,617.04	
Pseudo R^2	0.1145	

NOTES: *** denotes significant at the 1% level. Standard errors (in brackets) are clustered at the individual-level. This specification corresponds to the same specification reported in Table 2, extended with the variable "Recent displacement". Nascent Intrapreneurs were excluded from the estimation of this specification as, by definition, recent displacements are never verified before the transition of this particular group of Business-Owners. The results obtained for the remaining variables were not significantly different than those previously reported in Table 2, being available upon request from the authors.

As a robustness check, given that our "Recent displacement" variable mainly captures collective dismissals – implying that displaced individuals are not necessarily "lemons" – we have re-estimated the model using a broader definition of *Recent Displacement*, by considering as potentially unemployed workers all those individuals who were absent from the database in the two years preceding the transition into business-ownership. In this case, both collective and individual dismissals occurring during the two preceding years are certainly included in the set of individuals suffering a recent displacement. However, in this case, displacement episodes become over-estimated, as individuals being self-employed without employees prior to transition are also inevitably classified as unemployed. Even so, the results remained qualitatively unchanged even after enlarging the pool of potential unemployed individuals transiting into business-ownership (the estimated coefficients were 1.2618 for entries into entrepreneurship via start-up and 1.2974 for entries through acquisition, being both statistically significant at the 1% level), so we believe that the narrower definition of recent displacement used in this study does not significantly influence the results and the derived conclusions.

5 Empirical results on exit from entrepreneurship

5.1 Kaplan-Meier survivor functions and preliminary statistics

We now turn to the second phase of entrepreneurship dynamics – the post-entry persistence of BOs until they decide to exit and leave their position as BOs in the firm. Figure 1 depicts the estimated survivor function of BOs according to their entry route, without controlling for any differences in observed and unobserved BOs' characteristics, neither distinguishing between alternative exit modes. Using Kaplan-Meier (KM) estimator (Kalbfleish and Prentice, 1980), the unconditional probability of an individual surviving as BO beyond time t is computed as follows:

$$\widehat{S(t_j)} = \prod_{j=t_0}^{t} (1 - \frac{d_j}{n_j}), \tag{4}$$

where d_j is the number of exits in each time interval and n_j is the number of BOs at risk of exit. Equation (4), thus, corresponds to the product of one minus the "exit rate" at each of the survival times. In Figure 2 we adopt the same procedure to check whether any significant differences exist, unconditionally, among those who decide to transit alone and those who choose to become BOs and share the ownership of the firm with other BO(s).

The median duration of nascent BOs' spells is just two years for Intrapreneurs and Acquisition Entrepreneurs, and three years for Start-up Entrepreneurs. Figure 1 shows

that, without taking into account any differences between BOs and their firms, Start-up Entrepreneurs have higher survival rates in general and persist for longer periods in the same business. In contrast, Acquisition Entrepreneurs seem to leave the business earlier. The differences are statistically significant at the 1% level according to both Log-Rank and Wilcoxon tests. Figure 2 also suggests that significant survival differences exist among those who enter alone and those who share the business at entry. Without distinguishing between alternative exit modes, the former exhibit significantly lower survival rates, suggesting that sharing the risk with others may postpone the decision of leaving the business.

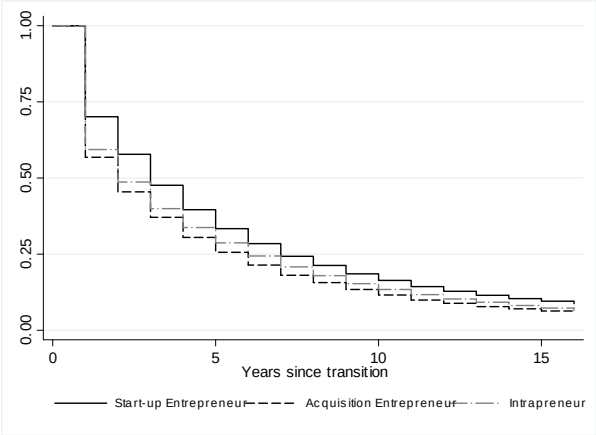

Fig. 1. KM survivor function, by BO type

Log-Rank Test: χ^2 =2057.71***; Wilcoxon Test: χ^2 =3316.14***

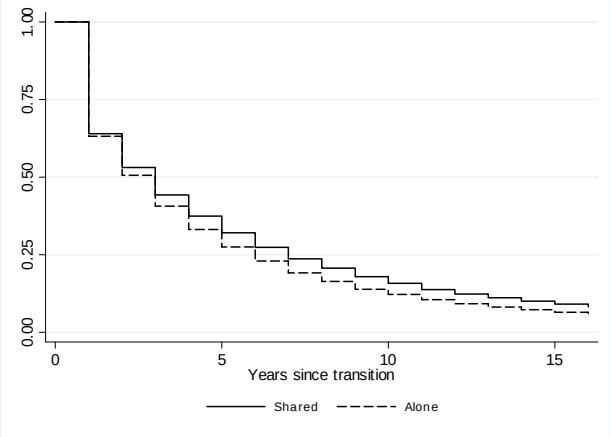

Fig. 2. KM survivor function, by mode of entry

Log-Rank Test: χ^2 =481.65***; Wilcoxon Test: χ^2 =183.19***

In Table 4, we briefly characterize BOs according to their exit mode. The variables listed in the Table correspond to the vector of (time-varying and time-invariant) explanatory variables included in the estimation of duration models described in section 3.4.2. At this level, and given the potential survival differences shown by BOs entering alone and those deciding to share the ownership of their business with others (Figure 2), we decided to split the three possible entry modes taking also into account the ownership structure chosen at entry (alone or shared)[19]. Also, prior experiences in the labor market now include the accumulated experience in the sector where nascent BOs enter. Standard individual-level and firm-level characteristics are included in the vector of variables.

Overall, 71% of nascent BOs have exited their business (24% have dissolved it and 47% have left the business without closing it down, by transferring it to others). We find a significantly higher proportion of entrants by start-up among those dissolving the business than among BOs exiting by ownership transfer. Also, those entering alone and those sharing the ownership of the business with others also seem to be differently exposed to both exit modes.

Table 4. Descriptive statistics, by BOs' exit mode (Portugal, 1992-2007)*

	Survivors[c]	BOs' exits by Dissolution	BOs' exits by Own. transfer
(Number of cases)	(60,342)	(50,003)	(96,022)
Entry Mode			
Start-up Entrepr. Alone (%)[a]	0.222	0.306	0.160
Start-up Entrepr. Shared Ownership (%)	0.285	0.249	0.225
Acquisition Entrepr. Alone (%)	0.078	0.106	0.090
Acquisition Entrepr. Shared Ownership (%)	0.120	0.092	0.142
Intrapren. Alone (Employee Buyout) (%)	0.091	0.111	0.124
Intrapren. Shared Ownership (Partnership) (%)	0.204	0.136	0.259
Prior experiences in the labor market as paid employee			
Experience in a Large Firm (%)	0.178	0.210	0.181
Experience in a Foreign Firm (%)	0.084	0.090	0.077
Number of different employers	2.438	2.456	2.234
Recent displacement (%)[b]	0.103	0.079	0.069
Years of experience in the (2-digit) sector	5.241	3.510	3.811

(It continues in the next page...)

[19] We did not take into account this disaggregation of BOs in section 4, when studying entry patterns, because additional estimations showed that no significant differences exist between the determinants of entry of BOs entering alone and those sharing the ownership of their business with others.

Table 4. Descriptive statistics, by BOs' exit mode (Portugal, 1992-2007)*

(cont.)	Survivors[c]	BOs' exits by Dissolution	BOs' exits by Own. transfer
(Number of cases)	(60,342)	(50,003)	(96,022)
Individual-level characteristics			
Male (%)	0.695	0.677	0.687
Age (years)	40.473	39.354	40.380
Less than 9 years of schooling (%)[a]	0.524	0.541	0.546
9 years of schooling (%)	0.133	0.176	0.168
12 years of schooling (%)	0.216	0.196	0.176
College education (%)	0.127	0.087	0.110
Firm-level characteristics			
Firm age (years)	10.303	7.514	10.867
Micro Firm (%)[a]	0.809	0.875	0.754
Small Firm (%)	0.177	0.114	0.205
Medium Firm (%)	0.013	0.010	0.035
Large Firm (%)	0.001	0.001	0.006
Urban Location (%)	0.405	0.435	0.435
Primary Sector (%)	0.017	0.015	0.019
Energy & Construction Sectors	0.134	0.148	0.120
Manufacturing (%)[a]	0.190	0.196	0.226
Services Sector (%)	0.659	0.641	0.635

NOTES: * Excluding BOs transiting in 2001 or 2002. [a] Variables used as reference categories in estimations. [b] Excluding Intrapreneurs, for whom displacement experiences before their transition are not applicable. [c] Survivors correspond to right-censored cases, i.e., those BOs whose exit is never observed until the end of the period analyzed.

Past labor experiences in large or foreign firms were more frequent among BOs exiting by dissolution. Survivor BOs, instead, have a larger accumulated experience (from previous job(s) in paid employment) in the sector where they currently operate. Displacements prior to entry into entrepreneurship were also more frequent amongst survivors.

Differences concerning age and gender seem not to be so remarkable. Higher educational attainments are more frequent among those who survive as BOs, and less frequent among those leaving by dissolving the firm. Lastly, the great majority of BOs' firms are micro-sized, particularly those owned by BOs who end up dissolving the business. BOs closing down operations own, on average, the youngest firms.

5.2 Estimation results from competing risks model

Table 5 reports the results from the estimation of the competing risks model.[20] Unobserved heterogeneity is always significant, exerting important effects on the shape of duration dependence.[21] After controlling for BOs' observed and unobserved characteristics, exits by dissolution present negative duration dependence – i.e., BOs' bankruptcy hazards decrease as their spells get longer –, while ownership transfers show an U-shaped duration pattern – BOs are less likely to exit by transferring the business to other BO(s) during their first years in business, becoming more prone to transfer the business to others about six to seven years after entering the firm.

Results show that entry mode significantly shape BOs' post-entry persistence. On the one hand, Nascent Entrepreneurs establishing a new business from scratch alone are significantly more likely to exit and dissolve the business earlier than all other groups of nascent BOs. On the other hand, they are the less likely to exit in a more voluntary basis, by transferring their business to others. So, despite BOs normally become more attached to a business started by them than to an acquired business – which impacts positively on their (voluntary) persistence as BOs – they also face significantly higher failure risks during firm's infancy (Freeman et al., 1983; Brüderl and Schüssler, 1990).

In addition, and using Start-up Entrepreneurs entering alone as the reference group, results consistently show that those entering through acquisition (of the employer firm or of a third, outside, business) – and especially those doing so with others – are the less prone to exit by dissolution, being however the ones who tend to leave and transfer the business earlier. This confirms that entering by acquiring an already established firm is not only less risky than establishing a new venture from scratch, but also that sharing the ownership of the firm with others contributes to share risks and resources, which probably reduce liquidity constraints and, consequently, bankruptcy hazards.

Regarding the effects arising from previous experiences in the labor market, a prior job in a foreign and/or large firm is found to increase both exit risks, confirming that individuals with such labor experiences have higher opportunity costs of remaining as BOs, and thus become less committed to the business-owner role. Also, a larger number of job shifts in the past significantly hastens BOs' exit, whatever their exit mode. In contrast, individuals becoming BOs after losing their job in paid employment persist longer in the business and

[20] As we are mainly concerned with the specific hazards of exiting by dissolution or by ownership transfer, more than with the overall hazard rate, we do not present the results obtained from the single-risk model. The results are, however, available upon request.

[21] *Rho*, presented at the bottom of Table 5, measures the proportion of total unexplained variance that is attributed to individual specific effects and σ_u corresponds to the standard deviation of the unobserved heterogeneity variance.

show lower exit risks. The effect is even stronger for exits by dissolution, so our results do not support that individuals coming from unemployment are less able to run a business or more likely to fail as entrepreneurs (Hinz and Jungbauer-Gans, 1999; Shane, 2009).[22] Regarding specific knowledge of the sector, the larger the accumulated experience in the sector where the BO currently operates, the lower the BO's hazard rate – especially dissolution hazard. Similar results were found by Sørenson and Phillips (2011) and Oberschachtsiek (2012), though none of them distinguish between different exit modes for the BO.

Finally, adverse macroeconomic conditions characterized by increasing unemployment rates in the country discourage both types of exits. Since periods of high unemployment reduce the opportunities of getting paid employment and the gains from job search, BOs tend to become more attached to their business and persist for longer periods in the firm when economic conditions worsen, as probably they will not find better alternatives in the labor market. The estimated effects of the business cycle are even more prominent for exits through ownership transfers, which is in line with the evidence that firms become acquisition targets more frequently during more favorable economic periods (e.g., Bhattacharjee et al., 2009).

Regarding the remaining variables, some individual and firm characteristics are also found to impact differently on BOs' exit, according to the exit mode followed. Higher levels of education are associated with lower dissolution hazards – supporting that BO's human capital helps to prevent business failure (Bates, 1990; Headd, 2003) – but also with more voluntary exits. The smaller and the younger the firm, the more likely will be an exit by dissolution and the less likely will be an exit by ownership transfer. Businesses located in urban areas also seem to be dissolved earlier, confirming that stronger competition characterizing more urban locations contribute to accelerate business failures (Fotopoulos and Louri, 2000; Littunen, 2000; Stam et al., 2010).

[22] However, we must underline that our analysis is confined to recent job losses (even when enlarging the pool of potential unemployed individuals suffering from either collective or individual dismissals – recall section 4.2.2). The literature often argues that nascent entrepreneurs coming from unemployment are more likely to fail because their human capital, knowledge and skills tend to depreciate during longer unemployment periods, or because they look at entrepreneurship as a last-resource solution for their problems in finding a job. In our case, as we focus on the effect of relatively recent displacements, we should not generalize our results, given that, as previously exposed, we are not able to accurately identify in our data all types of unemployed individuals (namely long-term unemployed individuals).

Table 5. Estimation results from the competing risks model (Portugal 1992-2007)[a]

	Exit by Dissolution	Exit by Own. Transfer
Entry Mode[b]		
Start-up Entrepren. - Shared Ownership	-0.5931***	0.1249***
	(0.0231)	(0.0165)
Acquisition Entrepren. - Alone	-0.1622***	0.7679***
	(0.0209)	(0.0232)
Acquisition Entrepren. - Shared Ownership	-0.8572***	0.9614***
	(0.0329)	(0.0246)
Intrapreneur Alone - Employee Buyout	-0.2095***	0.7388***
	(0.0225)	(0.0236)
Intrapreneur - Shared Ownership	-0.8146***	0.7805***
	(0.0315)	(0.0229)
Prior experiences in the labor market as paid employee		
Experience in a Large Firm	0.1215***	0.1155***
	(0.0153)	(0.0139)
Experience in a Foreign Firm	0.0228	0.0587**
	(0.0202)	(0.0185)
Number of different employers	0.0908***	0.1222***
	(0.0061)	(0.0054)
Recent displacement	-0.2418***	-0.0829***
	(0.0225)	(0.0202)
Years of experience in the (2-digit) sector	-0.0348***	-0.0176***
	(0.0022)	(0.0018)
Macroeconomic Environment		
Lagged Unemployment Rate	-0.0282***	-0.2419***
	(0.0038)	(0.0037)
Individual-level characteristics		
Male	-0.1686***	-0.1732***
	(0.0128)	(0.0112)
Age	-0.0642***	-0.1518***
	(0.0043)	(0.0039)
Age squared/100	0.0742***	0.1845***
	(0.0051)	(0.0047)
9 years of schooling[c]	-0.0618***	-0.1132***
	(0.0157)	(0.0133)

(It continues in the next page...)

Table 5. Estimation results from the competing risks model (Portugal 1992-2007)[a] (*cont.*)

	Exit by Dissolution	Exit by Own. Transfer
Individual-level characteristics (cont.)		
12 years of schooling[c]	-0.0601***	-0.1005***
	(0.0146)	(0.0130)
College Education[c]	-0.3360***	0.0680***
	(0.0210)	(0.0159)
Firm-level characteristics		
Firm age	-0.0260***	0.0216***
	(0.0011)	(0.0008)
Firm age squared/100	0.0058***	-0.0052***
	(0.0004)	(0.0004)
Small Firm[d]	-0.6900***	0.2518***
	(0.0243)	(0.0127)
Medium Firm[d]	-0.7815***	1.0682***
	(0.0561)	(0.0304)
Large Firm[d]	-1.1519***	1.7771***
	(0.1592)	(0.0673)
Urban Location	0.1808***	0.0160
	(0.0128)	(0.0104)
Primary Sector[e]	-0.1843***	0.4566***
	(0.0450)	(0.0359)
Energy & Construction Sector[e]	0.1485***	0.0516***
	(0.0203)	(0.0180)
Services Sector[e]	-0.1132***	0.1034***
	(0.0161)	(0.0136)
Duration Dependence	Negative	U-shaped
N	645,712	645,712
Log Likelihood	-170,275.98	-251,294.19
σ_u	1.1772	1.4147
Rho	0.4572	0.5489
LR test of rho=0 (χ^2)	165.37***	1480.78***

NOTES: *, ** and *** denote significant at 10%, 5% and 1% respectively. [a]Cloglog model with an Inverse Gaussian unobserved heterogeneity term. Base categories: [b]Start-up Entrepreneurs Alone; [c]Less than 9 years of schooling; [d]Micro Firms; [e]Manufacturing Industry. Both models include 16 duration dummies. The conclusions drawn from these 16 coefficients are summarized in the row "Duration Dependence".

6 Concluding Remarks

In this paper, we have conducted a comprehensive study on entrepreneurship dynamics, by studying the determinants of entry and exit of a large set of new entrepreneurs. By using a longitudinal matched employer-employee dataset, we were able to identify over 200,000 transitions of new business-owners and to follow them over time. This study adds to the existing literature on entrepreneurship by 1) analyzing both entry and exit issues, which must be understood as the two most important components of entrepreneurship dynamics; 2) showing that entrants into entrepreneurship are not a homogeneous mass of individuals, by identifying different profiles of nascent BOs; 3) unraveling exits by dissolution from exits by ownership transfer, using discrete time duration models that take into account individual unobserved heterogeneity; 4) providing new evidence on how prior experiences in the labor market and entry choices shape BOs' post-entry persistence and exit patterns.

Some final considerations can be derived from our results. Concerning entry, our findings suggest that the several types of nascent BOs are conducted by different drivers. Nascent Entrepreneurs, particularly those entering via start-up, seem to be more reactive to unemployment (both individual and aggregate), suggesting that they are closer to the so-called necessity-based entrepreneurs. The other two groups of Nascent BOs (Acquisition Entrepreneurs and Intrapreneurs) instead transit under more favorable economic conditions, probably responding also to an identified business opportunity or to a more satisfactory alternative to paid employment. Nascent Entrepreneurs are significantly pushed by more unstable trajectories in the labor market – characterized by a larger number of job shifts between different employers – being however strongly discouraged to enter a business after an employment experience in a large-sized or in a foreign-owned company.

Regarding BOs' persistence and exit from their first business, our results show that different exit modes can be, in part, predicted by BOs' entry route. New BOs entering, alone, via start-up are more likely to exit earlier and dissolve the firm, but much less likely to leave by transferring the business to others. Those who become BOs and share the business with other(s) are strongly less likely to close down operations. Labor experience in large-sized firms increase the opportunity costs of remaining in business-ownership, accelerating the exit decision of the BOs. Finally, our results do not support the widespread belief that entrepreneurs coming from a status of unemployment are more likely to fail and exit earlier. In opposition, those who have lost their job immediately before transiting into entrepreneurship are found to survive longer as BOs, being less likely to leave the business, whatever the exit mode. Industry-specific experience is also found to significantly increase the persistence of the BO in the firm, supporting the importance of learning-by-doing and informational advantages gained through the accumulation of specific knowledge.

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APPENDIX - Description of variables included in the empirical models

Categories of variables	Description of variables
Prior experiences in the labor market as paid employee	
Experience in a Large Firm	Dummy=1 if the individual has ever worked in a large firm (250+ employees) in the past.
Experience in a Foreign Firm	Dummy=1 if the individual has ever worked in a foreign firm (foreign capital >=50%) in the past.
Number of different employers	Number of different firms where the individual has already worked as paid employee until period t.
Recent displacement	Dummy=1 if the individual has exited a previous job in a firm that either closed or suffered a downsizing (in t-1 or t-2).
Experience in the sector*	Number of years of experience (as paid employee) in the sector (2-digit) where the individual has entered as business-owner.
Macroeconomic Environment	
Lagged Unemployment Rate	Annual lagged unemployment rate (one year lag).
Entry Mode*	
Start-up Entrepreneur Alone[a]	Dummy=1 if the individual becomes a Nascent Entrepreneur by establishing a new business alone; 0 otherwise.
Start-up Entrepreneur Shared	Dummy=1 if the individual becomes a Nascent Entrepreneur by establishing a new business with others; 0 otherwise.
Acquisition Entrepreneur Alone	Dummy=1 if the individual becomes a Nascent Entrepreneur by acquiring an existing business alone; 0 otherwise.
Acquisition Entrepreneur Shared	Dummy=1 if the individual becomes a Nascent Entrepreneur by acquiring an existing business with others; 0 otherwise.
Intrapreneur Alone (Employee Buyout)	Dummy=1 if the individual becomes the only BO of the employer firm; 0 otherwise.
Intrapreneur Shared (Partnership)	Dummy=1 if the individual becomes one of the BOs of the employer firm; 0 otherwise.
Individual-level characteristics	
Male	Dummy=1 for males, 0 for females.
Age	Age of the individual in years, in period t.
Age squared/100	Squared value of the age of the individual in period t, divided by 100.
Less than 9 years of schooling[a]	Dummy=1 if the individual has less than 9 years of schooling completed in period t, 0 otherwise.
9 years of schooling	Dummy=1 if the individual has 9 years of schooling completed in period t, 0 otherwise.
12 years of schooling	Dummy=1 if the individual has 12 years of schooling completed in period t, 0 otherwise.
College Education	Dummy=1 if the individual has a college degree (including masters and/or PhD degrees) in period t, 0 otherwise.
Previous wage job characteristics	
Overeducation	Dummy=1 if the individual was overeducated in the previous wage job, 0 otherwise.
Tenure	Tenure of the worker in the previous wage job, in months.
Tenure squared/100	Squared value of the individual's tenure in the previous wage job, divided by 100.
Management Position	Dummy=1 if the individual occupied a management position in the previous wage job, 0 otherwise.

APPENDIX - Description of variables included in the empirical models (cont.)

Categories of variables	Description of variables
Wage per hour	Ratio of the base wage over the total number of normal hours worked in the reference month (wages in 2005 constant prices).
Foreign Firm	Dummy=1 if the firm where the individual was previously employed had 50% or more of its capital held by foreign investors, 0 otherwise.
Micro Firm[a]	Dummy=1 if the firm where the individual was previously employed had less than 10 employees, 0 otherwise.
Small Firm	Dummy=1 if the firm where the individual was previously employed had between 10 and 49 employees, 0 otherwise.
Medium Firm	Dummy=1 if the firm where the individual was previously employed had between 50 and 249 employees, 0 otherwise.
Large Firm	Dummy=1 if the firm where the individual was previously employed had 250 or more employees, 0 otherwise.
Urban Location	Dummy=1 if the firm where the individual was previously employed was located in an urban center (i.e. districts of Porto and Lisbon), 0 otherwise.
Primary Sector	Dummy=1 if the firm where the individual was previously employed was operating in the primary sector, 0 otherwise.
Manufacturing[a]	Dummy=1 if the firm where the individual was previously employed was operating in the manufacturing industry, 0 otherwise.
Energy & Construction Sector	Dummy=1 if the firm where the individual was previously employed was operating in the energy or construction sectors, 0 otherwise.
Services Sector	Dummy=1 if the firm where the individual was previously employed was operating in the services sector, 0 otherwise.
Firm-level characteristics*	
Firm Age	Age of the firm in years.
Firm Age squared/100	Squared value of the firm age, divided by 100.
Micro Firm[a]	Dummy=1 if the BO's firm is micro-sized (less than 10 employees); 0 otherwise.
Small Firm	Dummy=1 if the BO's firm is small-sized (10-49 employees); 0 otherwise.
Medium Firm	Dummy=1 if the BO's firm is medium-sized (50-249 employees); 0 otherwise.
Large Firm	Dummy=1 if the BO's firm is large-sized (250 or more employees); 0 otherwise.
Urban Location	Dummy=1 if the BO's firm is located in an urban center (districts of Porto or Lisbon); 0 otherwise.
Primary Sector	Dummy=1 if the BO's firm belongs to the Primary sector; 0 otherwise.
Manufacturing[a]	Dummy=1 if the BO's firm belongs to the Manufacturing industry; 0 otherwise.
Energy & Construction Sector	Dummy=1 if the BO's firm belongs to the Energy or Construction sectors; 0 otherwise.
Services Sector	Dummy=1 if the BO's firm belongs to the Services sector; 0 otherwise.

[a] This variable is used as base category in our estimations. * These variables are only included in the estimations of duration models to study BO's duration in the firm.