LISBOA SCHOOL OF ECONOMICS & MANAGEMENT

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TRABALHO FINAL DE MESTRADO
DISSERTAÇÃO

Exit Strategies of Portuguese Start-Ups

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ORIENTAÇÃO:
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Abstract

The aim of this study is to infer the factors that lead to start-up exit from the individual and firm perspective.

Previous literature has only more recently focused on exit as an important part of the business and economic cycle. However, there is still a thin body of research applied to small companies, a framework of both founder and start-up exit and the differentiation between venture exit and death/bankruptcy.

Regarding this, we conduct a multinomial analysis for different outcomes: continuation, liquidation and sale and distinguish between voluntary and distress exit, based on venture performance., which is measured using Altman's Z-Score. We infer on the influence of start-up and founder characteristics, on the type of exit, using Portuguese firm-level financial data with the matched employer-employee database that contains unique and detailed information on start-ups and founders from 2004 to 2009.

Our results indicate that the size of the start-up and funding team, founder education, age and male gender positively impact the probability of continuation and sale and negatively impact liquidation. Younger founders are more likely to leave than to continue their ventures and older founders have lower odds of liquidation. Consistent with previous literature, bigger start-ups with more knowledgeable founders are less likely to liquidate.

***JEL*Classification:** G32; G33; G34; L26; M13
Keywords: Exit Strategies; Entrepreneurship; Start-Ups; Portugal

Resumo

O objectivo deste estudo é inferir sobre os factores que conduzem à saída do mercado pelas *start-ups*, da perspectiva do indivíduo e da empresa.

A literatura anterior tem-se apenas mais recentemente focado na saída como uma parte importante do ciclo económico e financeiro. No entanto, há ainda um corpo estreito do pesquisa aplicado a pequenas empresas, ao contexto que integre fundador e *start-up* e à diferenciação entre saída e morte/ falência empresarial.

Neste sentido, conduzimos uma análise multivariada para os diferentes acontecimentos: continuação, liquidação e venda, distinguindo entre saída voluntária ou involuntária de acordo com a performance da *start-up,* medida através do Altman's Z-Score. Inferimos sobre a influência das características do fundador e *start-up* no tipo de saída, usando dados financeiros de empresas e fundadores, que contêm informação única e detalhada de 2004 a 2009. Os resultados obtidos indicam que a dimensão da *start-up* e equipa de fundadores, educação do fundador, idade e género masculino afectam positivamente a probabilidade de continuação e venda e negativamente a de liquidação. Os mais jovens fundadores tem mais probabilidade de abandonarem os seus empreendimentos enquanto os mais velho têm menores probabilidade de liquidação. Consistente com literatura antecedente, as *start-ups* de maior tamanho e com fundadores com maior nível de educação têm menos probabilidade de se liquidarem.

Classificação *JEL*: G32; G33; G34; L26; M13

Palavras-chave*:* Estratégias de Saída; Empreendedorismo; "Start-Ups"; Portugal

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All errors and opinions expressed are those of the author and do not necessarily reflect those of the Government of Portugal or any other agency.

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"All firm births will eventually lead to their demise"

In Brown, Lambert & Florax (2009, pp. 6)

1. Introduction

Exit strategies allow entrepreneurs to cash-out the value of their ventures and it is recognized as one of the most important events of the firms' life cycle (Wennberg, Wiklund, DeTienne & Cardon, 2010).

Exit may occur from the individual or firm perspectives (Wennberg & DeTienne, 2014). From the firm perspective, entities cease to exist due to liquidations, buy-outs or mergers and acquisitions by insiders or outside investors (such as management buy-ins or buy-outs)[1] (Ronstadt, 1986; Schary, 1991; Balcaen, Manigart & Ooghe 2011). However, the life cycle of the entrepreneur may not match the life cycle of the company. From the individual perspective, the founder may sell her equity on the company to a strategic buyer, on the public market (also known as Initial Public Offering – IPO) or pass management to an insider, outsider or family member while the company remains as an on-going entity (Wasserman, 2003; Carter & Justis, 2009; Ryan & Power, 2012).

Previous literature has devoted considerable effort in explaining venture creation (Gatewood, Shaver & Gartner, 1995; Bhave, 1994; Forbes, 1999; Shook, Priem & McGee, 2003), growth and survival (Doms, Dunne & Robers, 1995; Audretsch, 1995; Helmers & Rogers, 2010), human capital and other determinants of performance (Becker, Murphy & Tamura, 1990; Temple, 1999; Barro, 2001; Coulombe, Tremblay

[1]A management buy-out is an operation where a management team acquires the total or a part of the capital of a company. A management buy-in is the same operation however the management team is an outsider (managers from another firm, for example).

& Marchand, 2004; Lévesque & Minniti, 2006) and the factors of survival (Shefrin & Statman, 1985; Keasey & Watson, 1991; Mata & Portugal, 1994). Nevertheless, the exit route by which a new venture ceases to exist or founder exit strategies have not been given particular attention especially regarding start-ups (Wennberg et al*.,* 2010). Exit literature has mainly focused on large enterprises, considering the industry or firm perspective and frequently as a part of research on firm dynamics at a regional/national level (Baldwin & Goreki, 1991; Frazer, 2005; Brown, Lambert & Florax, 2009; Huynh & Petrunia, 2010; Ozturk & Kilic, 2012; Resende, Ribeiro & Zaidan, 2013).

Entrepreneurial exit studies have focused unconnectedly on different definitions of exit. Previous literature has differentiated the individual and firm perspective, largely overlooking the interception between them (DeTienne, 2010; Wennberg & DeTienne, 2014). Several scholars have focused on exit from the self-employment perspective (Van Praag, 2003; Stam, Audretsch & Meijaard, 2006; Hessels, Grilo, Thurik & Zwan, 2010) while others on the exit of the firm from the market (Schary, 1991; Gimeno, Folta, Cooper & Woo, 1997). Researchers defend the need for a bridge between the two perspectives in order to better understand the relationship between individuals and their ventures (Davidsson & Wiklund, 2001; Sarasvathy, 2004; Wennberg & DeTienne, 2014). Moreover, firm exit by liquidation has been often associated with firm variables such as leverage[2] and performance[3]. Often, studies do not distinct between voluntary exit and involuntary exit/bankruptcy/firm failure. A broad body of literature focuses on firm exit perspective particularly liquidation and failure events (Coad, 2013),

[2]See for example Mata, Antunes & Portugal (2011)
[3] See for example Kaplan, (1998) and Astebro & Winter, (2012)

overlooking individual reasons to exit (Parker, Storey & Witteloostuijn, 2010) and possible harvest liquidations (Bates, 2005; Headd, 2003)

In this study we contribute to the exit literature by merging the two perspectives and using extraordinary data (matched employer-employee database), which allows us to track founders and their ventures. We start by classifying several exit events: liquidation and sale thus specifying both to voluntary or distress accordingly to the performance[4] of the start-ups.

We use a Multinomial Logit Model (MNL) to accommodate for the categorical dependent variable corresponding to the different exit strategies adopted by start-ups.

We find that founder characteristics such as gender, age and education along with start-up characteristics such as size of the venture (number of employees and establishments) and the size of the founding team significantly affect the exit strategy, which is consistent with results from previous bodies of research.

The next sections are presented as follows: Section II presents a review of the related literature on start-up exit, Section III is the theory and hypothesis, Section IV describes the data and finally on section V we present the methodology used and obtained results. Section VI concludes the study.

[4] The performance is measure using Altman's Z-Score for financially distress firms, which incorporates all relevant financial indicators of start-ups. The Z-Score is presented in detail on the Methodology section.

2. Literature review

Theories arising from Schumpeter's process of creative destruction suggest that new technologies and innovations are introduced by new firms which, if successful, replace established firms (Aghion & Howitt, 1990). Therefore, exit of the firm is an unavoidable part of the business cycle.

2.1 Exit and Fields of Research

Table 1 presents a summary of previous exit literature.

There is three main fields have contributed to exit research: economic career choice theory, strategy and organizational studies, and entrepreneurship (Wennberg & DeTienne, forthcoming).

The career choice perspective presents the relationship between self-employment, occupational motivations and entrepreneurship, using a macro-economic perspective[5]. This perspective assumes that two sets of factors affect entrepreneurial decisions: push and pull. [6] Entrepreneurship does not have the same propulsion or yields the same effects wherever it takes place. It is conditioned by financial, industrial, economic and geographical constraints and so are the exit strategies available (Evans & Jovanovic, 1989, Vivarelli & Quatraro, 2013).

[5] See for example Blanchflower (2000), Hamilton (2000) and Ghavidel (2012).

[6] Audretsch & Vivarelli (1995), for example, present job loss as an important "push factor" towards entrepreneurship. Therefore, when unemployment increases it is likely that the self-employment rate follows that same tendency. The "pull factors" are market opportunities that pull entrepreneurs to new ventures, Henley (2009).

Several studies build a bridge between the motivations for engaging in entrepreneurship and the outcome of the venture. Carrasco (1997) for example finds that those who become entrepreneurs while unemployed have lower survival rates. Taylor (1999), examines voluntary exits and bankruptcies and also finds a negative relationship between voluntary exits and previous unemployment. Ronstadt (1986) finds that 31% of exits are due to financial motives, while 28% were due to personal, familiar and business reasons and the remaining reported a combination of all of the above.

The strategy and organization studies investigate the role of financial performance on start-up exits. Exit is a reflection of firm performance (Wennberg et al*.,* 2010). While the majority of studies focus on exit as failure, few studies evaluate organizational success as more than business survival (see for example Brüderl, Preisendörfer & Ziegler, 1992). Some studies defend that bad performing firms are rejected by the environment (McGrath, 1999) and well-performing firms survive. Lane & Schary (1991), however, argue that the type of exit is not completely determined by profitability. They find heterogeneity on profitability patterns across exits. Their results indicate that firm characteristics alone are not sufficient to predict all exits. Additionally, performance is a subjective predictor of exit as the performance threshold ultimately depends on the founders' characteristics (Gimeno et al*.,* 1997). [7]

Finally, the entrepreneurship perspective focuses on entrepreneurs and their background, career history and other personal characteristics. DeTienne & Cardon (2006) find that human capital variables such as age, education and different types of human capital are related to different exit strategies. Thus, entrepreneurs with different

[7] For example, Van Praag (2003) finds that founder's age and industry experience relate to exit negatively. However, Harhoff & Körting (1998) find that founders closer to the retirement age increase the exit hazard for the firm.

motivations and thresholds pursue different exit strategies. Also, Gimeno et al., (1997) find that individuals with low performance thresholds choose to continue their firms despite comparatively low performance.

2.2 Determinants of firm mortality

The main factors that affect start-up mortality are firm characteristics such as age, size[8], industry[9] and human characteristics[10].

A stylized fact is that survival is positively correlated with firm age and size. (Evans, 1987; Doms et al., 1988; Phillips & Kirchhoff, 1989; Geroski, 1995; Audrestch, 1995). And, that this relationship generally holds across countries and business cycles (Baldwin, 1995; Mata & Portugal, 1994; Wagner, 1994; Audretsch, 1995), but not always across industries (Helmers & Rogers, 2010).

Empirical evidence indicates that a great majority of start-ups become dead firms very quickly (Baldwin & Gorecki, 1991) since the factors responsible for mortality, affect young and small firms harder (Geroski, 1995, p. 424). [11]

According to Bartelsman, Scarpetta & Shivardi, (2005)[12] about 20 to 40 percent of start-ups fail within the first two years of life, while only 40 to 50 percent survive beyond the seventh year (O.E.C.D, 2003, p. 145). In Portugal specifically, 30 percent of small

[8] See for example: Schary (1991), Harhoff (1998), Becchetti (2002), Cumming (2008), and Balcaen (2012).
[9] See for example: Audretsch (1997), Zhang (2003) and Sarmento (2010).
[10] See for example: Bruderl et al., (1992), Cooper et al., (1989), Dahlqvist (2000), Wennber (2009), Hessels (2011) and DeTienne, (2013).
[11] Audretsch et al., (1999) studied 1,570 new Italian manufacturing firms and found that hazard rates increased during the first two years and then tended to decrease, with a final survival rate after 6 years of activity of 59.1%. Bernard et al., (2007) found that over a typical five-year period, more than 30% of U.S. manufacturing plants shutdown. Mata & Portugal (1994) found that from manufacturing firms created in 1983 only 20% survived after the first year and from the remaining only 50% survive for fours year.

businesses liquidate on the first year of life. (I.N.E., *Demografia das Empresas 2004-200,* p. 4).

Access to financial markets and the availability of funds also affect firm mortality (Bates, 1990). [13]Previous literature suggests a positive relationship between the level of debt and the probability of bankruptcy (Mata et al*.,* 2011). Arguments proposed by Ross (1977) suggest that debt increases the likelihood of exit by bankruptcy due to conflict of interests between external players and managers. Jensen (1986) extends this arguments suggesting leverage helps to reduce manager entrenchment but augments the agency costs of debt.

Holtz-Eakin, Joulfaian & Rosen, (1994) find that if entrepreneurs cannot borrow, those entrepreneurs who have stronger personal financial resources are more likely to enter and become more successful than those who do not.[14] Those with better initial assets earn a higher entrepreneurial income, generating a more efficient level of capital for the firm.[15]

Founder characteristics also affect firm survival. Founders with more education and experience tend to be more successful because they are exposed to a greater amount of opportunities,[16] conversely amplifying their performance threshold[17] and the costs of continuing at the current venture, as their opportunity cost is higher for the choice of continuing. Pre-entry knowledge of the business activity and pre-entry management

[13] The type of financing has been studied as impacting mortality as well: Astebro & Bernhardt (2003) found that the rates of survival were higher when using personal or family related debt instead of bank loans. Bhattacharya et al., (2011), for example, found lower mortality for firms with quality underwriters and venture capitalists using a mortality table for U.S. public companies during 1985–2006.

[14] Individuals who are wealthier are more likely to become self-employed. See for example Evans & Leighton (1989) and Lindh & Ohlsson (1996).

[15] See Evans & Jovanovic (1989) for evidence, also supported by the evidence of Blanchflower, Oswald & Stutzer (2001), and Guiso et al., (2002).

[16] McMullen (2006), proposes that opportunity identification requires both the consideration of an individual's knowledge and his motivation.

[17] One implication of Gimeno et al., (1997) threshold theory is that entrepreneurs with fewer available opportunities may have a higher performance threshold, therefore delaying their decision to abandon the venture.

experience are important determinants for survival (Dencker, Gruber & Shah, 2009).[18] Likewise, the models of Jovanovic (1982); Lippman & Rumelt (1982) and Erickson, (1998) imply that entrepreneurs will only get knowledge on business creation, going through the process and they will analyze the performance as an indicator of success, subsequently deciding to stay or abandon the business (Stam, 2006). More specifically, small entrants face higher costs that are more likely to push them out (Lotti & Santarelli, 2004) and also experience a lower level of knowledge on their efficiency and cost structure[19].

Personal characteristics such as lack of passion (Bird, 1988), optimism (Puri & Robinson, 2005) and a positive attitude towards work effort (Douglas & Shepherd, 2000) usually lead to firm failure.

2.3 *Exit Strategies*

Exit strategies are defined in previous literature as a dichotomous outcome: founder exit and venture exit (Wennberg & Detienne, 2014).

Founder exit consists on sale of her share on the venture. The decision to sell equity often consists on desiring to leave self-employment (Bates, 2005; Van Praag, 2003), willingness to pursue other developments (Toft-Kehler, Wennberg & Kim, 2014), passing of management to a family member (Cater & Justis, 2009) or retirement (Coad, 2013). A start-up may be sold to another firm, individual or in the public market

[18] For other relevant studies on pre-entry knowledge and survival see for example: Brüderl et al., (1992), Carroll, Bigelow, Seidel & Tsai, (1996), Klepper & Simons (2000).

[19] From the models proposed by Jovanovic (1982) and extended by Ericson and Pakes (1998) and also Rumelt (1982) we extract that entrepreneurs are uncertain about their current entrepreneurial activities and are exploiting a new field in a learning process.

through an Initial Public Offering. However, exit may also be involuntary as several start-ups turn to venture capitalists or business angels and are often subjected to structural management changes, which can push-out the founder (Wasserman, 2003). In this case, the start-up continues to exist after founder departure.

Start-up exit consists on liquidation (Stam, Thurik & Zwan, 2007) or merger (Bayar & Chemmanur, 2011). Venture liquidation may be driven by financial distress leading to bankruptcy (Balcaen, Manigart & Ooghe, 2009) or by the founder exit and decision to liquidate the venture (Zwan & Hessels, 2013, McGrath, 2006)

Founder exit doesn't necessarily mean start-up exit. Still, founder exit, at some point, is unavoidable (Engel, 1999).

3. Determinants of Exit Strategies: Theory and Hypothesis

In this section, we review the main research and hypothesis on the determinants of exit strategies. Table 2 presents a summary of the expected effects of the founder and start-up characteristics hypothesized, on the determinants of exit strategies and respective empirical support.

Exit strategies are not only influenced by start-up mortality but by the whole collection of individual, firm and environmental variables (see for example: Bates, 2005, Cardon & Detienne, 2006, Audretsch, 2001, Mata & Portugal, 2002)

Firm characteristics such as age, size, organizational resources and performance strongly affect the type of exit strategy. (Brüderl et al., 1992)

Older start-ups usually have more experience on the process of value creation and have had more time to gain market experience from others (Mcgrath, 1999). For example, more mature start-ups, with higher initial human capital and a greater amount of tangible assets, are more likely to have superior productivity and performance. And, when in distress, are more proficient in postponing or avoiding liquidation then their smaller counterparts (Cooper, Woo & Dunkelberg, 1989; Davidsson & Wiklund, 2001; Balcaen et al., 2009).

Smaller start-ups have higher mortality rates and are usually not so attractive to outside buyers. In order with the stylized fact of positively skewed distribution of venture closure rates by venture age (Parker, 2009, pp. 409), we pose that younger and smaller firms are more likely to liquidate than to be sold to strategic buyers:

Hypothesis 1*: Start-ups with a higher number of establishments, employees and higher performance are more likely to be voluntarily sold or to continue than to be liquidate.*

Start-up founders have a significant influence on the exit event (Wasserman, 2003) and thus individual's characteristics and founder intentions[20] have been extensively studied as an influence on the exit strategy (Wennberg et al., 2010).

Industry and entrepreneurial experience of founders provide a greater network and market perspective (Pennings, Lee & Witteloostuijn, 1998). Which in turn, combined with personal characteristics such as opportunity identification also subject the individual to superior market opportunities (DeTienne & Chandler, 2004). For example, habitual or serial[21] entrepreneurs are more likely to exit voluntarily as they have done it before and have experienced the process (DeTienne & Shepherd, 2005). They benefit from having an exit strategy early on the business cycle (Dahl, 2005) for cashing-out their investment (Boecker, 1992).

Concerning founder characteristics, previous empirical findings have signaled education and industry experience of founders as instrumental variables the type of exit.[22] Wennberg et al., (2010), study the variables that affect the exit paths: individual variables such as founder's age, experience and education positively affect sale and harvest liquidation. Following Bates, (2005) we suggest that more educated owners usually have better performing and can accomplish more successful exits.

[20] DeTienne & Cardon, (2012) presented a study on post-exit entrepreneurs and concluded that 70% exited trough the intended path.
[21] Serial entrepreneurs are individuals who found multiple ventures over the course of their careers (Westhead & Wright, 1998).
[22] Germany: Prantl, (2003); U.S: Bates, (1990), Wheelock & Wilson, (2000), Bates, (2002); New England: Schary, (1991); U.K: Taylor, (1999).

Hypothesis 2*: Founders with higher levels of education are more likely to voluntarily liquidate or sell their ventures.*

Older entrepreneurs have, on average, greater social networks and resources that may not available for younger individuals. These networks permit that they connect to potential buyers, or other important players, whom can be of value when the exit decision is complete. However, older entrepreneur may have less available opportunities in the labor market increasing their interest in the continuation of the business (Cooper et. al, 1989; Evans & Leighton, 1989).

Female entrepreneurs are more likely to voluntary exit as they usually enter self-employment to achieve schedule independence and be able to maintain an active family role. (Detienne & Justo, 2009) Similarly, older entrepreneurs are more likely to have developed greater networks and business knowledge and education which enables them to proceed with more successful exits (Bates, 2005).

We offer that both female and older entrepreneurs have greater intentions of continuation than exit, however, are more able to voluntarily than involuntary exit.

Hypothesis 3a*: Older entrepreneurs and female entrepreneurs are more likely to maintain their business.*

Hypothesis 3b: *Older entrepreneurs and female entrepreneurs are more likely to voluntarily liquidate or sell their business.*

A larger group of founders usually means a greater amount of social and financial capital. It is also expected that the individual human capital, along with other assets of

the founders, may results in greater creation of value through synergetic development and higher performance (Barro, 2001). As a result, the size of the funding team of a start-up company may positively affect the success of the exit strategy.

***Hypothesis 4**: A funding team with more than one founder is more likely exit by voluntary sale or to continue.*

4. Data and Statistics

4.1 Data

The data for our empirical analysis comes from merging the matched employer-employee database (QP - "Quadros de Pessoal") with financial data, from the Simplified Corporate Information (SCIE). A combination between SCIE and QP was provided by the INE.

QP is mandatory survey submitted annually to the Portuguese Ministry of Employment and Social Security; it contains information regarding Portuguese private firm starting at the year of 1986, covering 220 000 firms and 2 000 000 individuals. The database makes it possible to match venture with their respective founders. At a firm level the database contains information: year of creation and closure, location, size and industry. For the founders, the following data is available: gender, age and education. This data also allows us to trace the founder's entire career history.

Finally, SCIE is also a mandatory survey that results from institutional assistance among the Portuguese Ministry of Justice, Ministry of Finance and Public Administration, National Institute of Statistics (INE) and Portuguese Central Bank. It collects year-end accounting information from on private firms and self-employed individuals in Portugal, allowing us to gather comprehensive information on financial characteristics of the start-ups.

4.2 Sample

From QP, we identify all start-ups established between 2004 and 2007, and their founders. Then, we restrict our sample to founders with age between 20 and 60 and, finally exclude firms which we could not identify at least one founder and respective background history. Next, we merge the start-up sample with financial data from SCIE and remove all firms for which we could not collect all the financial indicators to calculate Altman's Z-Score data. We end up with a sample of 45 086 founders 35 135 start-ups.

4.3 Descriptive Statistics

Table 3 presents the descriptive statistics of our sample.

Our sample includes 45 086 founders 35 135 start-ups established between 2004 and 2007 and are analyzed until 2009.

From this collection, 15 631 exits were observed by 2009, which corresponds to 35 percent of the sample. 16 percent exited by liquidation and the remaining 19 percent by sale.

The start-ups are small companies with on average four employees, one establishment, on average two founder established a start-up. There is considerable heterogeneity across industries, however the most predominant sectors are services, transportations and communications. Table 4 presents the summary statistics for start-up characteristics. Table 5 and 6 present the financial statistics for the sample.

The founders are mostly male individuals 67,63 percent and 32,37 percent are female. From which, on average, are 37 years old (most of the founders, about 41 percent, are between 31 and 40 years old, 25 percent of the founders are between 20 and 30 years old, 24 percent are between 41 and 50 years old and the remaining 10 percent are between 51 and 60 years old). Observing the nationality, 96 percent of the firm founders have Portuguese nationality and 4 percent are foreign. Regarding education, the average number of schooling is 16 years. The majority of entrepreneurs, approximately 38 percent, have a low level of education, around 11 percent have a very low level of education, 29 percent have a medium level of education and finally, the remaining 22 percent have a high level of education. Table 7 presents the summary statistics for founder characteristics.

5. Methodology and Results

5.1. Methodology

To evaluate the main determinants of each start-up exit strategy, we test empirically the relationship between the founder and firm characteristics for each exit path using the following regression:

1) $$Y_{i,s} = \beta_0 + \beta_1 x_i + \beta_{2,s} Z_s + \varepsilon_{i,s}$$

where $Y_{i,s}$ represents the dependent variable, β_0 is the intercept, $\beta_1 x_i$ is the vector of coefficients and founder characteristics, $\beta_{2,s} Z_s$ is the vector of coefficients and start-up characteristics and finally, $\varepsilon_{i,s}$ is the error term.

Our dependent variable $Y_{i,s}$, takes discrete values from 0 to 4 depending on the outcome, we consider continuation as the base outcome.

Continuation (0), Distress Liquidation (1), Voluntary Liquidation (2), Distress Sale (3), Voluntary sale (4).

Table 8 presents a matrix of the different exit strategies. Table 9 presents summary statistics for the exit strategies and financial performance of the sample.

To increase the validity of our results, we also present a competing model where the dependent variable is defined as: Continuation (0), Liquidation (1) and Sale (2). [23]

[23] We introduce this comparing model to control for the effect of the Independence of Irrelevant Alternatives (IIA) or Hausman test. This restriction states that the introduction of a new outcome should not change the probability of the existing ones. However, as we introduce a partition of exit strategies by performance we introduce this model to validate the independence of alternatives and provide robustness check of our results.

Continuation is defined using the information provided on start-ups on whether there was exit by the venture or/and the founder. If the venture left by 2009, the exit strategy is defined as liquidation. If there was no exit of the venture but there was exit of the founder, the start-up is considered as sold. If there is no exit, then the dependent variable is classified as continuation. To distinguish between distress and voluntary sale or liquidation we assess the performance level using Altman's Z-Score (2000), which evaluates performance based on all the relevant financial information and we classify companies as being in distress when they have a score under 2.0:[24]

2) $$\text{ZSCORE} = 0.012\,T_1 + 0.014\,T_2 + 0.033\,T_3 + 0.006\,T_4 + 0.999\,T_5$$

T1= Working Capital / Assets,
T2= Net income[25] / Total Assets,
T3= EBIT / Assets,
T4= Equity/Liabilities,
T5= Sales/Assets.

As start-ups exit routes are discrete and non-competing events we use a Multinomial Logit Model (MNL). The assumptions of this model are random heterogeneity, inclusion of all relevant variables, and non-heteroscedasticity of the error term. To control for fixed effects we introduce industry, entry and municipality variables.[26]

[24] As robustness check we calculate two additional models using cut-off points for performance and classification of distress of 1.5 and 2.5. Results are presented in tables 12 and 13, respectively.
[25] We assume retained rate=1 and thus use net income as a proxy for retained earnings.

Our independent variables include a vector of founder characteristics, the variables to be used are gender: coded 0 for female and 1 for male, age: coded Age 20-30 for individual with age between 20 and 30 years old, Age 31-40 for individuals with age between 31 and 40 years old, Age 41-50 for individuals with age between 41 and 50 years old, Age 51-60 for individuals with age between 51 and 60 years old. We also use education: coded high education for founders with bachelors, masters or doctoral degrees; medium education for individuals reporting a high school or technical high school; low education for individuals that attended school until the 9th grade; and very low education for individuals with lower than the 9th grade; foreign, measured as a dummy variable equaling one for foreign founders and zero for Portuguese founders. We also include a vector for start-up characteristics. We include size (logarithm of initial number of employees and establishments) and the number of founders.

As robustness check we introduce performance (a categorical variable coded as Low Performance, which equals one for start-ups with Z-Scores lower than 2.0, Medium Performance, for start-ups with performance between 2.0 and 3.0 and High Performance, for start-ups with Z-Scores higher than 3.0). However, we only introduce performance as independent variable in the model with three outcomes, table 8 columns 5 to 6.[27]

Table 11 Columns 1 to 4 present the results for the multinomial model with 4 exits compared to the base scenario of continuation, thus possible outcomes are: Continuation, Distress Liquidation, Voluntary Liquidation, Distress Sale and Voluntary

[27] In the model with five outcomes, table 8 columns 1 to 4 we use performance to differentiate between distress and voluntary sale and liquidation/sale, so it is not included in this model as independent variable due to perfect prediction.

Sale. Columns 5 to 6 present the multinomial model with 3 outcomes: Continuation, Liquidation and Sale. The distinction between voluntary and distress is made using a Z-Score performance cutoff of 2.0.

5.2 Results

5.2.1 Liquidation

Table 11 column 5 reports the impact of the start-ups characteristics on the exit strategy Liquidation *versus* Continuation.

Similar to previous results, size and founder characteristics are the most important variables, all coefficients are significant at the 1% level. Male gender (-0,28), education (-0,59), size (-0,268) and number of founders (-0,238) inversely affect the log odds of liquidation over continuation. On the other hand, being foreign (0,615), age between 20 and 30 (0,525) or 31 and 40 (0,124) and having a low performance (0,185) increase the log odds of liquidation.

5.2.1.1 Distress Liquidation

Table 11 column 1 reports the results for the impact of start-ups characteristics on distress liquidation.

One unit increase in education, gender (being male instead of female), size or number of founders, individually, *ceteris paribus*, results in a factor decrease of the log odds of distress liquidation over continuation of -0,197, -0,026, -0,363, -0,259 respectively.

Unitary increase in the variables foreign and age 20 to 30, that is, reporting that a founder is foreign or with the 20 to 30 age group increases, *ceteris paribus*, the log odds of distress liquidation over continuation by 0,528 and 0,444, respectively.

5.2.1.2 Voluntary Liquidation

Table 11 column 2 reports the results for the impact of start-ups characteristics on voluntary liquidation.

The most influential variables are gender, nationality, education, age and the number of founders of the start-up.

A single increment on education level, age group, gender (being male) or on the number of founders individually, all else equal, causes a factor decrease on the log odds of voluntary liquidation relatively to continuation of 0,169, 0,275, 0,175 correspondingly. On the other hand, increasing the variable foreign by 1 unit (being foreign instead of Portuguese), *ceteris paribus*, positively affects the odds of voluntarily liquidating by 0,738. Similarly, age groups from 20 to 50, all positively affect voluntary liquidation in opposition to continuation, more strappingly 20 to 30, by a factor of 0,742, 0,252 and 0,168.

5.2.2 Sale

Table 11 column 6 reports the results for the impact of start-ups characteristics on sale.

All else equal, male founders have an increased odd of continuation over sale of 0,061 over female founders.

Being foreign or being within the 20 to 30 age group increases the odds of sale over continuation by 0,187 and 0,180, individually and respectively.

Having low performance or increasing the number of founders, *ceteris paribus*, causes an increase on log odds of sale *versus* continuation of 0,346 and 0,111, independently.

5.2.2.1 Distress Sale

Table 11 column 2 reports the results for the impact of start-ups characteristics on distress sale.

Distress sale is negatively affected by size. An increase in size causes a decrease in the odds of distress sale over continuation of 0,058. Conversely, an increase in the number of founders causes an increase in the log-odds of distress selling over continuing of 0,528. Finally, changing the age group of the founder to the 20 to 30 age group (Age 20 to 30 = 1) causes and increase in the log-odds of distress sale of 0,180, all else constant.

5.2.2.2 Voluntary Sale

Table 11 column 3 reports the results for the impact of start-ups characteristics on voluntary sale.

Gender and education inversely affect voluntary sale. Being male decreases the odds of voluntary sale over continuation by a factor of 0,101. Similarly, an increase in the education level leads to a decrease in the odds of 0,071.

Variables foreign, age 20 to 30, size and number of founders positively affect voluntary sale. Being foreign instead of Portuguese increases odds by 0,306, *ceteris paribus*. If a founder is with the 20 to 30 age group odds of voluntary sale over continuation increase

by a factor of 0,181. Lastly, a unitary rise in start-up size or number of founders, all else constant, leads to an increase in the odds of voluntary sale instead of continuation of 0,184 or 0,396, accordingly.

5.4 Additional Remarks

In tables 12 and 13 we provide results for two models where we decreased and increased the performance threshold to define distress/voluntary sale/liquidation. Results are consistent with the model on table 8 (performance threshold Z-Score of 2.0).

Our results support hypothesis 1a and 1b, 2, 3b and 4. Hypothesis 3a is not clearly confirmed by the results.

6 Conclusions

Start-up exit is an important issue in the life cycle of the firm. Thus, in this study we evaluate the main determinants for different exit strategies. In comparison with previous literature on two types of outcomes: continuation and mortality, we define a new framework, introducing multiple outcomes and applied to the Portuguese entrepreneurial market. The data was retrieved from "Quadros de Pessoal" and includes start-up and founder information for the period of 2004 and 2009. We selected proxies for the variables of interest and a multinomial regression analysis was conducted to obtain significant coefficients.

Start-up size is associated with sale and continuation and negatively affects liquidation indicating that greater companies are less likely to liquidate. Our results are consistent with previous literature, which indicates that smaller entrants have higher liquidation rates. As proposed by Wennberg & Detienne, (2014, pp. 13), we found that greater funding teams are in fact associated with harvest exits and positively correlated with higher performance.

Founder characteristics such as age, gender, education and nationality also impact greatly the exit strategy adopted.

Regarding gender, male founders are much more likely to continue the current venture than to exit, results indicate negative association with all exits.

Furthermore, a greater level of education reduces odds of liquidation comparatively to continuation. Consistent with previous empirical research, more educated founders are

more likely to conduct surviving and more successful ventures and thus less likely to liquidate.[28]

Founder's on their 20's to 30's are more likely to exit than to continue, however, the age effect on liquidation *versus* continuation is decreasing. Older entrepreneurs (between 31 to 40 and 41 to 51) are more likely to liquidate than to maintain the start-ups, however, less likely to liquidate than their younger counterparts. The effect of age on sale is not significant to specify causality and effect.

Founders who are foreign are more likely to exit by any means than to continue. The most notorious effect is on liquidation. Foreign founders are more likely to liquidate than Portuguese founders.

Comparing the models on Table 8, we can assess that not all liquidating firms had financial indicators of distress; some of the start-ups that exited by voluntary liquidation had high performance Z-Scores (Table 11 presents companies which liquidated with a Z-Score of over 2.5), which is consistent with previous literature that not all liquidations are associated with poor financial performance.[29]

Finally, in the MNL which includes three outcomes: Continuation, Liquidation and Sale, performance was included, however, the coefficients obtained vary broadly and there are not consistently significant, for that reason consistent results are not provided.

Our study lacks some founder information, such as entrepreneurial experience, information on merger and initial public offerings, which unfortunately was not available, constituting a limitation in this study. Data limitation restrains us to use the exit strategies that we could determine.

[28] See for example Bates (2002), Stam et al., (2007)
[29] See for example: McGrath, (1999), Gimeno et al., (1997).

Notwithstanding the limitations, this study provides important information for policy-makers, entrepreneurs with new or established ventures. Founders can think about viable exits for their businesses from the start as a way to cash out on their investment and look to the determinants of firm failure. Policy makers can summarize the determinants of firm extinction and dynamics to define guidelines for entrepreneurial fomentation and development in a sustainable manner.

Future investigation can complement our research by conducting an inquiry to ex-entrepreneurs to better understand the motivations for exiting. Also, similarly to previous literature we accounted for start-ups liquidating even tough their performance was above the threshold. Therefore, although we consider the factors that affect different exit strategies to be of extreme relevance, the motivations and intentions should also be explored as an explanatory element for pursuing an exit strategy.

Our study can also be complemented by the inclusion of other relevant variables such as proxies for: social network, entrepreneurial experience, family indicators and so on.

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8. Appendix

Table 1: Empirical Evidence - Summary of Previous Studies

Paper	Topic	Methodology	Data	Ind. Variables	Dep. Variables	Exit perspective	Findings
Brüderl, Preisendörfer & Ziegler, 1992	Factors affecting mortality of businesses	Event History Analysis/multivariate analysis using a hazard rate model	1849 founders in Germany, data from "Munich Founder Study"	Years of education, experience (industry, entrepreneurship,leadership), age, innovation, associated businesses, industry, seasonality, legal form	Survival time in months	Firm/ Individual	Founders with higher human capital found business more likely to survive
Bates (2005)	Association of founder characteristics and responses to whether they were successful at liquidation	Logistic Regression Models	1425 small businesses shutdown between 1993-1996	Age, education, gender, experience, ongoing business when bought, minority, year entered, industry	Liquidation (successful or unsuccessful)	Firm	Founders often closed firms with being unsuccessful. Higher level of education and sectors with lower sunk costs to entry have lower rates of reported unsuccessful closure
Wasserman (2003)	Analysis of founder-CEO replacement	Cox event-history model	202 internet companies	Founder previous exp., nº of founders, timings of financing rounds, firm valuations	CEO succession	Individual	Founder succession is more likely after the product development phase and after rounds of financing

Paper	Topic	Methodology	Data	Ind. Variables	Dep. Variables	Exit perspective	Findings
DeTienne & Cardon (2006)	Impact of initial resources on exit	ANOVA and binary logistic regression	167 founders of electrical and medical equipment industry	Age, size, size of funding team, % ownership, innovation, initial investment	IPO/sale to individual/strategic sale	Firm/ Individual	Human and technological resources/size funding team/ directly affect possibility to exit by IPO. Greater % of ownership connect to sale to an individual - dependence to founder's motivations
Justo & DeTienne (2009)	Survey on ex-entrepreneurs on why they exited their business	Logistic Regression Models	GEM (Global Entrepreneurship Monitor) Spanish survey for year 2007. Sample of 189 usable questionnaires.	Founder family status (marriage, children), gender, age, experience, capital invested/income. Firm age, industry and performance	Sell opportunity/not profitable/retirement/funding problems/personal reasons/other opportunity	Firm/ Individual	Marriage and family dependence more relevant predictors than performance. Female are more likely to voluntarily leave their business
Wennberg,Wiklund, DeTienne & Cardon, (2010)	Model for firm sale and liquidation in both well performing and distress firms in Sweden	Multinomial Logit Model	1735 new ventures and founders over 8 years	Age, education, outside job, industry experience, gender, parental entrepreneurship, county tenure, industry	Continuation, Liquidation (harvest / distress), sale (harvest/distress)	Firm/ Individual	Experience positively affects harvest sale vs liquidation. Age positively affects sale vs all other exits. Outside job positively affects exit vs continuation

Paper	Topic	Methodology	Data	Ind. Variables	Dep. Variables	Exit perspective	Findings
Balcaen, Manigart & Ooghe, (2009)	Time between distress and exit of firm	Multivariate Tobit Model	5233 non-starting firms distress firms (not all privatly held) in Belgium	Cash, Leverage, Firm size, Total assets, debt level, produtivity, profitability, investments, cash holdings, receivables, inventory	Voluntary and involuntary liquidation (early and late)	Firm	Slack resources (eg. cash holdings) help to postpone involuntary exit. But decrease the time to voluntary liquidations (managers want to cash in and avoid further losses)
Ryan & Power (2012)	Factors influencing founder's decision to exit	Multinomial Tobit Model	396 firms gathered from Ireland and Scotland	Size, age, exit plan, geographical location	Family succession, sale, shutdown	Firm/ Individual	Irland: Larger firms and firms closer to the city are more likely to expect transfer - Scotland (more likely to sell)

Table 2: Expected effects of founder and start-up characteristics on exit routes.

	Expected Effect	Empirical Evidence
Founder Characteristics		
Age	(+) Successful sale and liquidation	Bates (1990)
	(-) Continuation, distress sale and liquidation	Prantl (2003)
Education	(+) Successful sale and liquidation, continuation	Wennberg, Wiklund, DeTienne & Cardon, (2010)
	(-) Distress sale and liquidation	Dahlqvist (2000)
Gender	(+) Successful sale, continuation	DeTienne & Justo (2009)
	(-) Distress sale, distress/ successful liquidation	Bates (2005)
Start-up Characteristics		
Size (number of employees and number of establishments)	(+) Successful sale and liquidation, continuation	Cardon & Detienne (2009)
	(-) distress sale and liquidation	
Performance	(+) Successful sale and liquidation	Balcaen, Manigart & Ooghe, (2009, 2011)
	(-) distress sale and liquidation	
	(+) continuation	Mcgrath (2006)
Size funding team	(+) Successful sale and liquidation	
	(-) distress sale and liquidation	Detienne & Wennberg (2014)
	(?) continuation	

(+) Positive correlation expected; (-) Negative correlation expected; (?) Ambiguous effect

Table 2 represent the characteristics introduce as independent variables for this study (column 1), the effects expected based on previous research (column 2) and the supporting evidence of literature (column 3).

Table 3: Descriptive Statistics of the Sample

	Mean	Median	Std. deviation
Number of initial employees	3,592	2,000	5,127
Number of founders	1,645	1,000	0,789
Number of establishments	1,026	1,000	0,233
Age	2,946	3,000	1,444
Altman's Z-Score	2,399	1,218	35,940
Age of the founders	37,344	36,000	0,203
Number of years of education of the founder	15,745	5,000	27,235
Number of observations			**45 086**

All values are in units.

Table 3 presents the statistics for the sample of 45.086 observations.

As we can the sample is represented by very small and young start-ups with on average 4 employees, 2 founders, 1 establishment and 3 years of age.

The founders have on average 37 years old and 16 years of education.

Altman's Z-Score is used as a measure of performance and is calculated according to the following equation:

$$\text{ZSCORE} = 0.012\,T_1 + 0.014\,T_2 + 0.033\,T_3 + 0.006\,T_4 + 0.999\,T_5$$

T1= Working Capital / Assets,
T2= Net income[30] / Total Assets,
T3= EBIT / Assets,
T4= Equity/Liabilities,
T5= Sales/Assets.

[30] We assume retained rate=1 and thus use net income as a proxy for retained earnings.

Table 4: Summary Statistics on Start-up Characteristics

	Absolute Frequency	Relative Frequency	Cumulative
Number of initial employees			
1 to 5	3851	85,43%	85,43%
6 to 10	4 540	10,07%	95,50%
11 to 50	1 975	4,38%	99,88%
More than 50	54	0,12%	100,00%
Number of founders			
1	22 871	50,73%	50,73%
2	17 088	37,90%	88,63%
3	3 687	8,18%	96,81%
4 to 5	1 440	3,19%	100,00%
Number of establishments			
1	44 239	98,12%	98,12%
More than 1	847	1,88%	100,00%
Altman's Z-Score			
Low Performance	33 150	73,53%	73,53%
Medium Performance	6 038	13,39%	86,92%
High Performance	5 898	13,08%	100,00%
Number of observations			**45 086**

Relative frequencies are thousands of units.

Table 4 represents the statistics for the start-up characteristics of the sample.

The entire sample was included, both exiting and continuing ventures.

Most of the start-ups are very small companies, only 54 of them have more than 50 employees and the large majority has less than 5.
The average number of founders is a funding team of only one founder, however a significant portion has two founders.
98,120% of the start-ups have only one establishment and only 1,880% have more than one.
Finally, using Altman's Z-Score we are able to identify that most of the start-ups have low performance, a total of thirty three thousand one hundred and fifty ventures. Low performance if for start-ups with a Z-Score lower than 1.5, medium considers Z-Scores between 1.5 and 2.5 and High are Z-Scores over 2.5

Table 5: Financial Statistics of Start-Ups (Exiting ventures)

	Mean	Median	Standard Deviation
EBIT	-696 746	-308 000	85 669
Working Capital	-2 001 144	-5 885	330 784
Net Income	-5 280 480	-992	148 545
Short Term Assets	163 973	45 309	590 441
Short Term Debt	165 974	61 994	492 606
Equity	22 374	3 836	555 599
Debt	154 941	39 886	740 698
Assets	240 792	75 955	1 211 201

All values are presented in Euros.

Table 6: Financial Statistics of Start-Ups (Continuing Ventures)

	Mean	Median	Standard Deviation
EBIT	6 373	2 313	88 486
Working Capital	4 933	-829	380 791
Net Income	-298	1 004	117 629
Short Term Assets	187 425	63 475	583 808
Short Term Debt	183 332	74 258	589 903
Equity	33 971	11 353	253 833
Debt	221 240	85 417	884 867
Assets	271 047	103 257	1 030 989

All values are presented in Euros.

Table 5 represents the financial statistics of start-ups, which adopted one of the exit strategies. And, Table 6 presents statistics on those who continued by 2009.

These financial data served as supported for the calculus of the Z-Score and for measuring performance.

As we can from the comparison between both tables, the companies that exited the market had lower profit than those who did not.

Also, continuing start-up had a higher level of assets. According to previous research this is an indicator often associated with postponing exit.

Table 7: Summary Statistics on Founder Characteristics

	Absolute Frequency	Relative Frequency	Cumulative
Gender of founders			
Female	14 595	32,37%	32,37%
Male	30 491	67,63%	100,00%
Nationality of founders			
Portuguese	43 151	95,71%	95,71%
Foreign	1 935	4,29%	100,00%
Age of the founders			
Age 20 to 30	11 374	25,23%	25,23%
Age 31 to 40	18 275	40,53%	65,76%
Age 41 to 50	10 958	24,30%	90,07%
Age 51 to 60	4 479	9,93%	100,00%
Education			
1 - Very Low Education	4 861	10,78%	10,78%
2 - Low Education	17 417	38,63%	49,41%
3 - Medium Education	12 969	28,77%	78,18%
4 - High Education	9 839	21,82%	100,00%
Number of observations			**45 086**

All values are presented in units.

Table 7 presents statistics for founder characteristics.
Most of the founder are male and have on average 37 years old.

Regarding education, the level is defined as: high education for founders with bachelors, masters or doctoral degrees; medium education for individuals reporting a high school or technical high school; low education for individuals that attended school until the 9th grade; and very low education for individuals with lower than the 9th grade

The sample is balanced between very low and low education and medium or higher education. Most of the founders have a low level education.

The large majority are Portuguese founders, representing 95,71% of the sample.

Table 8: Exit Strategies

	Founder Exit	**Start-up Exit**	
High Performance	Voluntary Sale	Voluntary Liquidation	
Low Performance	Distress Sale	Distress Liquidation	

Table 9: Summary Statistics of Exit Strategies

	Absolute Frequency	Relative Frequency	Cumulative
Continuation	29 445	65,31%	65,31%
Distress Liquidation	5 129	11,38%	76,68%
Voluntary Liquidation	2 077	4,61%	81,29%
Distress Sale	6 294	13,96%	95,25%
Voluntary Sale	2 141	4,75%	100,00%
Number of observations	45 086	100,00%	100,00%

Table 8 presents statistics on the exit strategies presented on Table 9.
Continuation is established for start-ups, which were still in business with the same founder as owner on 2009.
Liquidation is the label for firms, which were not in business by 2009. And, sale is for those who were in business registered with a different owner.
The distinction between High and Low Performance is made according to Altman's Z-Score, where start-ups with a Z-Score under 2,0 are considered to have a low performance and being in financial distress.

Table 10: Correlation Matrix of Dependent and Independent Variables.

	EXIT	Gender of the founder	Education of the founder	Age of the Founder	Foreign	SIZE	Number of founders	Performance
EXIT	1,000							
Gender of the founder	-0,021	1,000						
Education of the founder	-0,003	-0,121	1,000					
Age of the Founder	-0,038	0,038	-0,251	1,000				
Foreign	0,022	0,007	-0,008	0,014	1,00			
SIZE	0,030	0,041	-0,151	0,050	0,024	1,000		
Number of founders	0,106	0,003	-0,060	-0,024	-0,011	0,319	1,000	
Performance	0,011	0,006	-0,014	0,001	0,008	-0,003	0,000	1,000

Table 11: Multinomial Logit Models – Four and Two Exit Strategies

Variables	(1) Distress Liquidation	(2) Voluntary Liquidation	(3) Distress Sale	(4) Voluntary Sale	(5) Liquidation	(6) Sale
Gender	-0,197***	-0,275***	-0,047	-0,101**	-0,218***	-0,061**
	(0,034)	(0,051)	(0,032)	(0,051)	(0,030)	(0,028)
Education	-0,026	-0,169***	0,036*	-0,071**	-0,059***	0,008
	(0,022)	(0,032)	(0,019)	(0,032)	(0,019)	(0,017)
Foreign	0,582***	0,738***	0,135*	0,306***	0,615***	0,187***
	(0,076)	(0,104)	(0,078)	(0,114)	(0,066)	(0,067)
Age 20-30	0,444***	0,742***	0,180***	0,181**	0,525***	0,180***
	(0,063)	(0,098)	(0,056)	(0,088)	(0,055)	(0,049)
Age 31-40	0,068	0,252***	-0,045	-0,022	0,124**	-0,039
	(0,060)	(0,096)	(0,053)	(0,084)	(0,053)	(0,046)
Age 41-50	-0,034	0,168*	-0,039	-0,088	0,026	-0,052
	(0,063)	(0,097)	(0,054)	(0,086)	(0,055)	(0,048)
SIZE	-0,363***	-0,043	-0,058**	0,184***	-0,268***	0,010
	(0,028)	(0,036)	(0,024)	(0,037)	(0,023)	(0,020)
Nº. of Founders	-0,259***	-0,173***	0,328***	0,396***	-0,238***	0,346***
	(0,035)	(0,049)	(0,022)	(0,035)	(0,030)	(0,019)
Low perfor.					0,185***	0,111***
					(0,052)	(0,042)
High perfor.					0,599***	0,062
					(0,063)	(0,056)
Observations	45 086				45 086	

Robust standard errors in parentheses

Robust standard errors are: ***Statistical significance at 1%, **significance at 5%, *significance at 10%.

Note: In both models on Table 8, Continuation is the base category, which omitted from the output. The table evaluates several firms' characteristics (size, number of founders and performance) and founder's characteristics (education, age, gender and nationality) on start-up's exit strategies. All regressions include county, industry and entry year control variables.

Columns 1 to 4 present a model where the possible exit strategies are Distress Liquidation, Voluntary Liquidation, Distress Sale and characteristics Voluntary Sale.

The distinction between Distress and Voluntary is made according to the start-up's performance measure by the Z-Score (distress is set for ventures with a score lower than 2.0). Performance is not included as independent variable.

Columns 5 and 6 represent a second model where the exit strategies are liquidation or sale, in this model performance is included as independent variable.

Table 12: Multinomial Logit Model – Decrease in performance threshold

Variables	(1) Distress Liquidation	(2) Voluntary Liquidation	(3) Distress Sale	(4) Voluntary Sale
Gender	-0,209***	-0,236***	-0,061*	-0,062
	(0,036)	(0,045)	(0,034)	(0,042)
Education	-0,004	-0,169***	0,043**	-0,045*
	(0,023)	(0,028)	(0,021)	(0,026)
Foreign	0,568***	0,715***	0,172**	0,195**
	(0,080)	(0,093)	(0,085)	(0,099)
Age 20-30	0,380***	0,780***	0,137**	0,247***
	(0,066)	(0,088)	(0,060)	(0,073)
Age 31-40	-0,014	0,346***	-0,083	0,028
	(0,063)	(0,085)	(0,057)	(0,070)
Age 41-50	-0,097	0,228***	-0,073	-0,018
	(0,066)	(0,086)	(0,059)	(0,072)
SIZE	-0,429***	-0,041	-0,102***	0,164***
	(0,031)	(0,031)	(0,026)	(0,030)
Nº. of Founders	-0,232***	-0,224***	0,312***	0,395***
	(0,037)	(0,044)	(0,024)	(0,029)
Observations	45,086			45 086
	Robust standard errors in parentheses			

Robust standard errors: ***Statistical significance at 1%, **significance at 5%, *significance at 10%.

Note: On Table 9 Continuation is the base category, which omitted from the output. The table evaluates several firms' characteristics (size, number of founders and performance) and founder's characteristics (education, age, gender and nationality) on start-up's exit strategies. All regressions include county, industry and entry year control variables.

Columns 1 to 4 present a model where the possible exit strategies are Distress Liquidation, Voluntary Liquidation, Distress Sale and characteristics Voluntary Sale.

The distinction between Distress and Voluntary is made according to the start-up's performance measure by the Z-Score (distress is set for ventures with a Z-Score lower than 1.5).

No significant change in the effect of the independent variables on the log odds of the exit paths relative to the previous model (cutoff at 2.0).

Table 13: Multinomial Logit Model – Increase in performance threshold

Variables	(1) Distress Liquidation	(2) Voluntary Liquidation	(3) Distress Sale	(4) Voluntary Sale
Gender	-0,213***	-0,241***	-0,050*	-0,112*
	(0,033)	(0,058)	(0,030)	(0,062)
Education	-0,033	-0,190***	0,037**	-0,128***
	(0,021)	(0,037)	(0,018)	(0,039)
Foreign	0,597***	0,744***	0,156**	0,301**
	(0,072)	(0,119)	(0,074)	(0,139)
Age 20-30	0,454***	0,788***	0,178***	0,199*
	(0,060)	(0,111)	(0,053)	(0,105)
Age 31-40	0,094	0,212*	-0,036	-0,053
	(0,058)	(0,109)	(0,050)	(0,101)
Age 41-50	0,001	0,103	-0,032	-0,143
	(0,060)	(0,109)	(0,052)	(0,102)
SIZE	-0,330***	-0,046	-0,026	0,159***
	(0,026)	(0,040)	(0,022)	(0,045)
Nº. of Founders	-0,254***	-0,168***	0,329***	0,417***
	(0,033)	(0,056)	(0,021)	(0,042)
Observations	45 086			45 086
	Robust standard errors in parentheses			

Robust standard errors: ***Statistical significance at 1%, **significance at 5%, *significance at 10%.

Note: On Table 9 Continuation is the base category, which omitted from the output. The table evaluates several firms' characteristics (size, number of founders and performance) and founder's characteristics (education, age, gender and nationality) on start-up's exit strategies. All regressions include county, industry and entry year control variables.

Columns 1 to 4 present a model where the possible exit strategies are Distress Liquidation, Voluntary Liquidation, Distress Sale and characteristics Voluntary Sale.

The distinction between Distress and Voluntary is made according to the start-up's performance measure by the Z-Score (distress is set for ventures with a Z-Score lower than 2.5).

No significant change in the effect of the independent variables on the log odds of the exit paths relative to the previous model (cutoff at 2.0 or 1.5).