

Entrepreneurs Throughout the Crisis: What Are They Like?

Rui Baptista Brunel Business School, Brunel University London and CEG-IST, Universidade de Lisboa

Joana Mendonça IN+, Instituto Superior Técnico, Universidade de Lisboa

Hugo Castro Silva CEG-IST, Instituto Superior Técnico, Universidade de Lisboa

Preliminary Version

Abstract

This paper looks at the human capital profiles of entrepreneurs and their initial teams over time and examines how they change during an economic crisis. Recessions increase unemployment, lowering the opportunity cost to start a new firm and potentially leading to increases in entry rates into entrepreneurship. However, the opposite effect may occur because the credit crunch that accompanies financial crises raises the cost of finance and makes liquidity constraints more binding. Using linked employer-employee data, we examine the human capital composition of Portuguese entrepreneurs and their initial teams before and during the recent financial crisis. We find that those entering entrepreneurship in the wake of the crisis are both more educated and have greater labour market experience than those entering entrepreneurship before the crisis. While there is a significant increase in founders coming from unemployment, a greater proportion of new entrepreneurs targets high tech industries and knowledge intensive services.

1. Introduction

This work looks at the profiles of entrepreneurs and their initial teams over time, and examines how they change during an economic crisis. Recessions may lower the opportunity cost to start a new firm, leading to increases in entry rates into entrepreneurship. However, the opposite effect on entry rates may occur because the credit crunch that accompanies financial crises raises the cost of finance and makes liquidity constraints more binding. Determining the overall effect on the human capital profiles of entrepreneurs and their initial workforces requires further research.

It is reasonable to assume that recessions will not affect solely the likelihood of entry of new firms and their post-entry performance, but also influence the characteristics of the individuals starting new firms, and the composition of their teams when they found new firms. Koellinger & Thurik (2012) argue that there are more start-ups due to missing employment alternatives, and that individuals are more able to take risks when in a position of lower opportunity costs to self-employment than before. Given the conditions in the labour market, it is also possible to assume that it is easier for entrepreneurs to find better-qualified personnel to add to their initial team.

However, economic crises may affect different individuals in different ways depending on their levels of human capital. Crucially, while the opportunity cost of founding or joining a new firm for those at the fringe of the labour market (usually the less educated and experienced) is likely lowered by a recession, the opportunity cost for the ones with higher levels of human capital (more likely to be gainfully employed) may actually increase because returning to wage employment following an unsuccessful entrepreneurial experience is likely to be harder during a crisis. Those individuals may, therefore, be more hesitant towards an entrepreneurial experience. We aim to shed light on whether lower opportunity costs have weaker or stronger effects on occupational choice when compared with perceived risk.

In this work we look at the human capital composition of Portuguese entrepreneurs and at their initial teams before and after the financial crisis. Portugal is one of the EU countries more strongly affected by the economic crisis, where austerity led to significant tax raises and pay-cuts. From 2009 to 2012, the unemployment rate doubled to over 16%, while youth unemployment more than doubled to almost 38%. Wage cuts

and increased unemployment likely reduced the opportunity costs of self-employment for a large share of the workforce. Simultaneously, the credit crunch likely raised borrowing and liquidity constraints, impacting new firm creation particularly for those entrepreneurial projects requiring significant initial investments.

2. Background

Entrepreneurs are believed to have specific characteristics that make them different from employees (see, for instance, Caliendo et al. 2011). Highly qualified individuals are generally more likely to become founders, and founders' human capital largely determines initial conditions such as start-up size (Colombo et al. 2004; Mata and Machado 1996) and credit constraints (Åstebro and Bernhardt 2005). Founders' human capital also positively influences the firm's chances of success of the firm, as a major predictor of survival (Brüderl et al., 1992; Baptista et al., 2014) and growth of (Colombo and Grilli 2005; Bosma et al. 2004; Koeller and Lechler 2006).

The composition of the founders' knowledge and skills also plays a vital role. Lazear (2004) and Wagner (2003) show that individuals with a more balanced set of skills are more likely to become self-employed than those who are more specialized with fewer skills. More recently, Hessels et al. (2014) show that skill variety *“improves start-up success, while skill balance does not. Furthermore, it is found that prospective entrepreneur's skill variety in particular facilitates the establishment of innovative new business”* (Hessels et al. 2014:27).

In any case, the literature has consistently shown that founders' characteristics are important for new firm performance, and that entrepreneurial characteristics play an important role in explaining why some firms survive and grow while others fail. Brüderl et al. (1992) argue that greater human capital enhances the productivity of the founder, which results in higher profits and, therefore, lower probability of exit. Higher productivity of the founder means that the business owner is more efficient in organizing and managing operations or is able to attract more customers, negotiate better contracts with suppliers and raise more capital from investors. Baptista et al. (2014) find that various forms of entrepreneurial experience (e.g. industry-specific;

managerial; and business ownership) contribute positively to the likelihood that a firm will survive the critical first years after start-up. Moreover, entrepreneur's human capital may be related to the innovative activity of the firm, as entrepreneurs with higher education or more work and managerial experience are more likely to be innovators. Consequently, firms managed by entrepreneurs with higher human capital will show higher levels of innovative activity (Cooper et al., 1994).

In addition to the founders' characteristics, Teece et al. (1997) argue that human capital forms the basis of firm's' dynamic capabilities to learn and adapt to new circumstances. Mata and Portugal (2002) argue that the education of a firm's workforce can be regarded as a measure of ownership advantages. Vinding (2004) argues that firms with highly developed human resources are more likely to have higher levels of innovative activity. Dahl and Klepper (2007) find that employees hired in the earliest stages of business formation are a key element of future firm success, as more talented labour can develop ideas, such as organizational methods or innovative concepts, leading to increased firm performance. Baptista et al. (2013) find that more skilled entrepreneurs hire more skilled workers and that the quality of the match between business owners and their hires has a positive impact on productivity and wages, suggesting that entrepreneurial skills have an impact not only on job creation, but also on the quality of jobs created.

Research suggests that external factors, mostly associated with the business cycle, may contribute for the decision to become self-employed. In economic downturns, people may be pushed into self-employment due to the lack of satisfactory alternatives in the labour market (Acs et al. 1994, Alba-Ramirez 1994, Moore and Mueller 2002), while in periods of economic growth, there may be an optimistic context pulling people into starting their own firm (Evans and Leighton 1989, 1990; Blanchflower and Oswald 1991).

Individual characteristics also affect the decision to become self-employed. Individuals may become entrepreneurs to fulfil the desire to be independent (Blanchflower et al., 2001). More educated individuals have a higher probability of choosing self-employment as they tend to be better informed and are more likely to identify market opportunities (Lucas 1978, Borjas 1986, Carrasco 1999). However, higher educated

individuals also have a larger number of employment alternatives in the labour market, thus suggesting that education may in fact deter the choice to become an entrepreneur by raising opportunity costs. Conversely, less educated individuals may observe a smaller number of options in the labour market and be forced to start their own firm (or stay in self-employment) as an alternative to unemployment (Gimeno et al, 1997), particularly under negative economic circumstances such as recessions.

3. Research Questions

The key question is whether those individuals becoming entrepreneurs after the crisis – i.e. those experiencing less risk and lower opportunity costs have higher or lower levels of human capital, as this will dictate whether new firms born from the crisis are more or less likely to perform and contribute to recovery. Thus, in this paper, we address the following research question:

i) Did entrepreneurs' human capital profiles change after the crisis? In what way?

A large amount of research has been conducted on the volume and effect of start-ups during a recession and their impact on economic recovery. However, the recession should not only affect the amount of entrepreneurial activity but, because recessions changes labour market conditions, it should also impact the profile of new entrepreneurs and the composition of their initial team. For example, Koellinger and Thurik (2012) expect that there are more marginal start-ups due to missing employment alternatives. In addition, the authors predict that individuals faced with the sudden unemployment will be more inclined to found new companies because opportunity costs to self-employment are lower in a recession. Therefore, in this paper we also consider the following research question:

ii) Are the initial teams of workers in start-ups different after the crisis with regard to their human capital?

We address these questions by exploring a matched employer-employee dataset with data for Portugal for the period 2005-2012.

4. Data, Methodology, and Descriptive Statistics

We use the ‘Quadros de Pessoal’ (QP) Micro Data Set, a longitudinal matched employer-employee data set covering the Portuguese economy. It originates from a mandatory yearly survey that every company with at least one paid employee submits to the Portuguese Ministry of Employment and Social Security. Information on workers and business owners include age, gender, schooling, tenure, date of admission in the company, labour status, and job/hierarchical assignment. Additionally each worker has a unique identification number allowing for the mapping of workers’ job-to-job flows, thus also making possible the construction of variables that assess the pre-entry experience of entrepreneurs. Given the data’s extension and detail, it can be used to study issues requiring large samples while controlling for several heterogeneity factors. Recent work using QP data include: Martins (2009); Geroski et al. (2010); and Baptista et al. (2012).

We focus our analysis on business owners and workers of companies founded between 2005 and 2012. In Portugal, the crisis’s effects are generally considered to have started in 2009 (first year of negative GDP growth in every quarter, with a contraction of around 2%) and have extended well into 2014. By starting our analysis in 2005, we have four years of pre-crisis data. Because data is only available up to 2012, we also have four recession years (data is only available up to 2012), giving us a somewhat balanced data set.

Individuals are identified as business owners through a labour status variable that distinguishes between business owners and paid employees. Business owners that are present in the company’s first year of activity are considered to be founders. In a similar fashion, individuals who are founders but are also present in the first year of activity are considered to be members of the firm’s initial team. However, around 20% of the companies in our data have no identified founder. This may happen because some companies do not correctly identify the business owners using the labour status variable. Table 1 shows the distribution of new companies, founders and members of initial team by cohort of year of foundation.

**TABLE 1 – NUMBER OF COMPANIES FOUNDED, FOUNDERS,
AND MEMBERS OF INITIAL TEAM BY COHORT**

Year of foundation	New companies	Founders	Members of initial team
2005	20,622	11,423	50,424
2006	21,672	12,839	54,065
2007	24,288	14,496	58,340
2008	24,804	14,766	59,881
2009	21,301	12,077	48,633
2010	15,793	8,847	41,068
2011	17,248	10,283	42,692
2012	16,044	8,958	38,998
Total	161,772	93,689	394,101

Profiles of entrepreneurs and their teams may vary with sector characteristics. For instance, knowledge based industries rely more on knowledge than the others, and include activities that are more intensive in their levels of technology and human capital. Knowledge based entrepreneurial activity requires a steady flow of novel ideas in order to flourish. The existence of human capital with the technological knowledge required to recognize and implement entrepreneurial opportunities arising from novel ideas is essential for successful technology commercialization. Therefore, we develop a separate analysis for two groups, according to the level of knowledge requirement: high-tech and knowledge intensive services, and low tech and low knowledge intensive services.

Because we are especially interested in founders of new companies that have higher intensity of technology and knowledge usage, we classify companies in four categories – High-technology manufacturing, Knowledge Intensive Services, Low-technology manufacturing, and Less-Knowledge Intensive Services – according to the OECD classification based on direct R&D intensity using Eurostat’s version with NACE Rev. 2 codes of economic activities¹. Our High-technology manufacturing cat-

¹ The data set uses NACE Rev. 1.1 codes up to 2006 and NACE Rev 2 codes from 2007 on. The change caused some companies to be categorized in a different sector. See annex for tables of NACE codes used.

egory also includes OECD’s Medium-high-technology class. Similarly, our Low-technology category also includes OECD’s Medium-low-technology classification. Table 2 gives us the distribution of founders and initial team members in each group.

TABLE 2 – DISTRIBUTION OF FOUNDERS AND INITIAL TEAM MEMBERS BY SECTOR

Sector	Initial team	Founders
High-technology manufacturing	3,219	638
Low-technology manufacturing	62,661	8,279
Knowledge-intensive services	49,129	17,826
Less-knowledge-intensive services	169,213	48,015
Other sectors	109,879	18,931
Total	394,101	93,689

Our descriptive statistics reveal changes in the profiles of entrepreneurs in the crisis period. In the long run share of entrepreneurs with higher education has been increasing at a faster rate than that for the Portuguese population. However, in 2010 there was a drop in the share of more educated founders and from then on the growth rate slowed down to match the rate for the population (Figure 1).

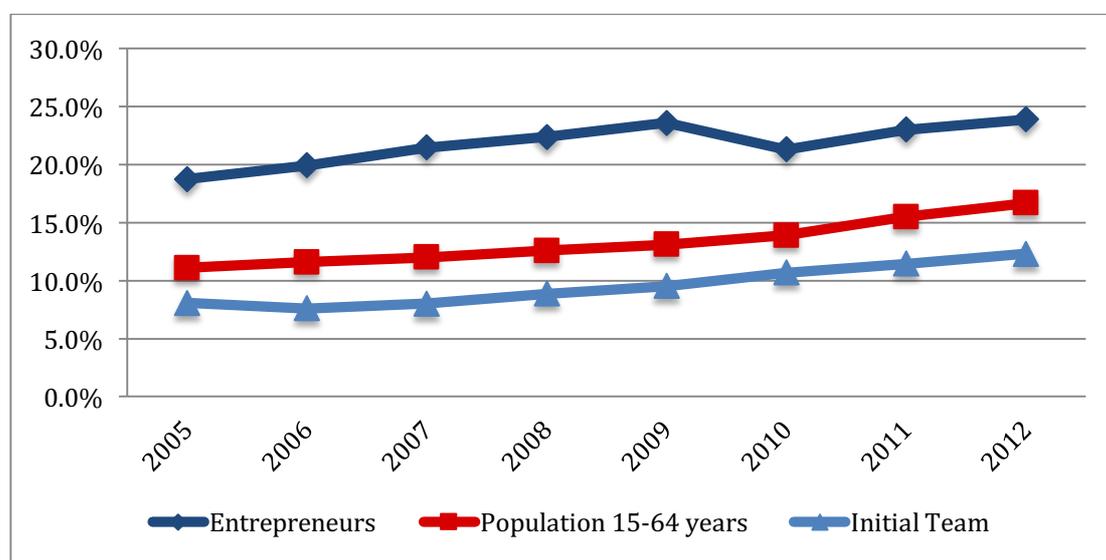


Figure 1 – Share with university education. Source: Quadros de Pessoal, INE.

Additionally, even though more entrepreneurs have spent an increasing amount of years studying, there is also a tendency of growing labour market experience (Table 3) that may help explain why the mean age of founders has been rising (Table 4).

TABLE 3 – ENTREPRENEURS’ YEARS OF LABOUR MARKET EXPERIENCE

Year of foundation	Mean	Std. Dev.
2005	4.05	4.21
2006	4.33	4.40
2007	4.68	4.60
2008	4.94	4.74
2009	5.23	4.98
2010	5.97	5.30
2011	6.05	5.45
2012	6.38	5.75

Note: Years of experience when founding the company.

TABLE 4 – ENTREPRENEURS’ AGE

Year of foundation	Mean	Std. Dev.
2005	37.1	9.9
2006	37.1	9.8
2007	37.1	9.7
2008	37.6	9.8
2009	37.9	10.0
2010	38.3	10.0
2011	38.8	9.7
2012	39.2	10.1

Note: Entrepreneur’s age when founding the company.

We also observe a change in the recent background of entrepreneurs in firms founded during the recession. Comparing Tables 5 and 6, we can see there are less founders

coming from non-employment² during the recession period, which might be explained by the restricted access to credit. Founders coming from unemployment are typically associated with necessity-based entrepreneurship. The share of educated entrepreneurs who were recently in a non-employment status decreased by over 5 percentage points while the drop was of 2.1 percentage points in both categories of those less educated. Because they lack employment alternatives, people with less years of schooling will still try to establish a new venture as a solution to unemployment, even if the access to credit is limited (Koellinger and Thurik 2012). However, the more educated, realizing the credit restrictions may not be as inclined to found a necessity-based venture where their skills are less likely to affect the success of the company (Baptista, Karaöz, and Mendonça 2014).

TABLE 5 – RECENT BACKGROUND OF ENTREPRENEURS BY EDUCATION LEVEL (2005-2008)

	Basic	High School	University	Total
Non-employment	52.6%	50.8%	55.3%	52.7%
Business owner	12.0%	9.3%	8.6%	10.5%
Wage worker	35.2%	39.7%	35.9%	36.6%
Other	0.2%	0.1%	0.2%	0.2%
Total	100.0%	100.0%	100.0%	100.0%

TABLE 6 – RECENT BACKGROUND OF ENTREPRENEURS BY EDUCATION LEVEL (2009-2012)

	Basic	High School	University	Total
Non-employment	50.5%	48.5%	50.2%	49.8%
Business owner	12.8%	10.1%	10.4%	11.4%
Wage worker	36.2%	41.2%	39.0%	38.4%
Other	0.5%	0.3%	0.4%	0.4%
Total	100.0%	100.0%	100.0%	100.0%

² In our study, non-employment is defined as not being observed in the data set in the two years prior to the year of foundation. Thus, this includes not only people who were unemployed but also new entrants to the data set either joining the labour market for the first time or leaving the public sector for the first time. We cannot accurately distinguish between these cases in our data.

Figure 2 further shows the trend in the recent backgrounds of entrepreneurs. Of particular interest is the increase in founders coming from non-employment in more recent years which, again, may suggest an increase in necessity-based entrepreneurship.

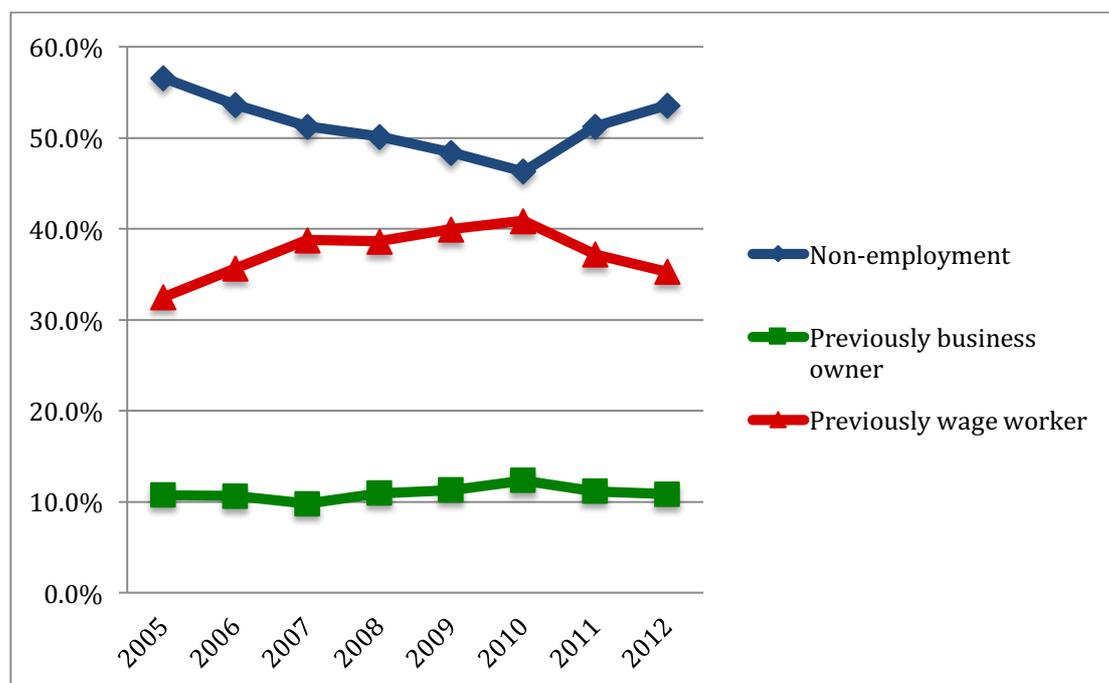


Figure 2 – Share of entrepreneurs by type of recent background

Besides these changes in the human capital profiles of founders, we also see a move towards high-technology manufacturing and knowledge-intensive services (Table 7). While this trend suffered a step back in 2010, during the recession years new technologically intensive or knowledge demanding firms represent a bigger share than before the financial crisis hit Portugal. Furthermore, during the period of financial crisis, the concentration of educated entrepreneurs increased substantially in sectors that are more demanding in the usage of technology or require higher degrees of knowledge (Table 8).

**TABLE 7 – DISTRIBUTION OF ENTREPRENEURS BY
LEVEL OF KNOWLEDGE/TECHNOLOGY INTENSITY**

Year of foundation	High	Low
2005	13.4%	58.1%
2006	14.0%	56.7%
2007	19.0%	62.4%
2008	21.3%	60.2%
2009	23.5%	60.6%
2010	20.7%	62.6%
2011	24.1%	59.9%
2012	23.4%	60.8%

Note: 'High' includes high-tech and medium-high-tech manufacturing and knowledge-intensive services. 'Low' includes low-tech and medium-low-tech manufacturing and less-knowledge-intensive services.

**TABLE 8 - DISTRIBUTION OF ENTREPRENEURS' EDUCATION LEVELS BY
LEVEL OF KNOWLEDGE/TECHNOLOGY INTENSITY (2005-2008)**

	Basic	High School	University	Total
High (2005-2008)	31.6%	32.2%	36.3%	100.0%
High (2009-2012)	26.7%	30.8%	42.5%	100.0%
Low (2005-2008)	71.1%	22.1%	6.7%	100.0%
Low (2009-2012)	67.1%	25.4%	7.5%	100.0%

Note: 'High' includes high-tech and medium-high-tech manufacturing and knowledge-intensive services. 'Low' includes low-tech and medium-low-tech manufacturing and less-knowledge-intensive services.

Figure 3 shows that in the High-technology and Knowledge-intensive sectors the share of entrepreneurs with a college diploma increased in the recession period³. In general, we find that, in the crisis period, founders are more skilled and, possibly because of having more skills, there is an increasing share of entrepreneurs in high-technology and knowledge-intensive sectors.

³ Some of the growth from 2006 to 2007 may be explained by the previously referred change in NACE codes.

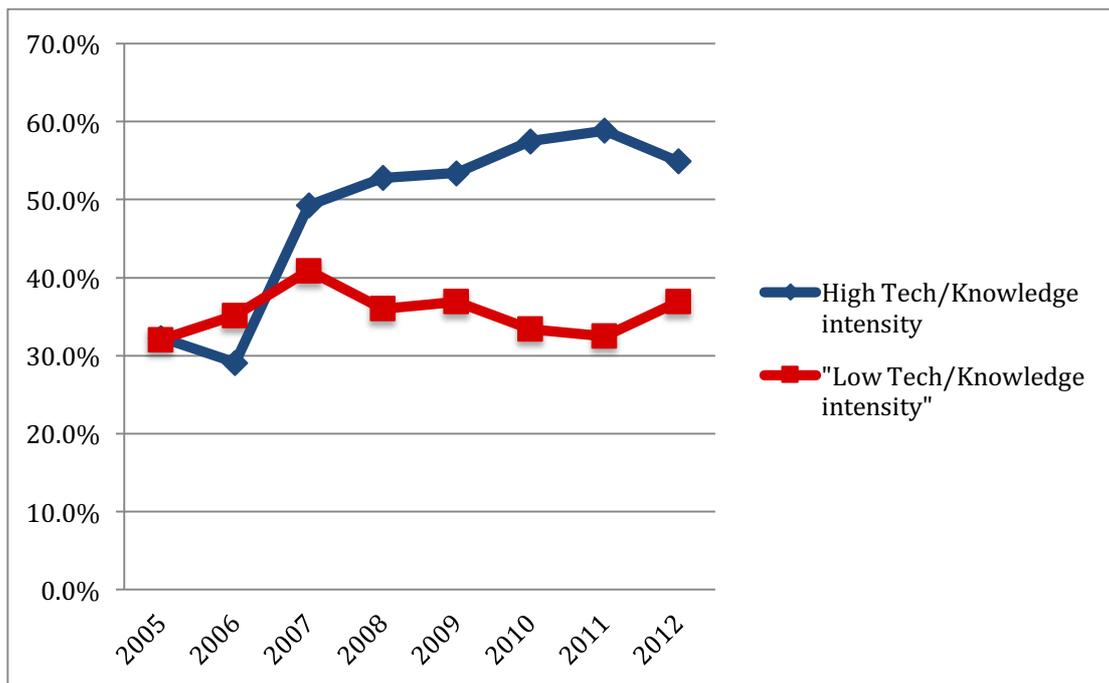


Figure 3 – Share of entrepreneurs with higher education by Technology and Knowledge intensity

To ascertain whether the crisis contributed to the observed changes in the profiles of entrepreneurs, using data for the first year of activity of the company, we estimate discrete choice models to determine the effects several individuals' characteristics have on the decision to start a company and observe how these effects change in the recession period through an interaction term. These characteristics include education, labour market experience and recent background such as coming from unemployment, experience in the same sector of the new venture and experience as a business owner.

Given the increasing share of founders in sectors that are more demanding in the usage of technology or require higher degrees of knowledge, we also disaggregate our analysis by sector of activity. We expect the crisis to have a negative effect on the probability of becoming an entrepreneur, but this effect will be different for different levels of education. On one hand, more educated people may be less affected by the crisis, given their wider range of opportunities. On the other, the perception of the risk of founding a new venture during a recession may be higher and so, because they may have more employment opportunities, more skilled workers will refrain from trying self-employment.

Additionally, if the *push* effect is present, we expect the effect of coming from unemployment will not only be positive but should also increase during the crisis.

5. Empirical Analysis

In order to examine the impact of the financial crisis on the likelihood of self-employment, we first estimate a Logit model of the probability to become a founder, using the whole sample regardless of sector of activity. The estimation results of our general specification are displayed in Table 9 and the marginal effects of the key variables are presented in Table 10.

**TABLE 9 – PROBABILITY OF BEING AN ENTREPRENEUR
GENERAL SPECIFICATION**

Crisis year	0.877*** (0.012)
High School	2.204*** (0.029)
High School * crisis	0.913*** (0.018)
Higher Education	3.397*** (0.055)
Higher Education * crisis	0.894*** (0.021)
Comes from non-employment	1.398*** (0.018)
Non-employment * crisis	1.148*** (0.019)
Number of observations	487,437
Pseudo R2	0.208
Log-likelihood	-188,806.1
Likelihood ratio chi2	99,435.7
Prob > chi2	0.000

Notes: This table reports the logit odds ratios and standard errors (in parentheses) for maximum likelihood estimation of probability of being an entrepreneur.

Regressions also include controls labour market experience, sector experience and experience as business owner, gender, age, log of number of employees in new firm, and sector.

Base case is male, working as a paid employee in a different sector two years prior to analysis year, who did not finish high school.

*** Significant at the 1 percent level, ** Significant at the 5 percent level, * Significant at the 10 percent level.

**TABLE 10 – AVERAGE MARGINAL EFFECTS OF
GENERAL SPECIFICATION**

Crisis	-0.013*** (0.001)
High School	0.096*** (0.001)
Higher Education	0.163*** (0.002)
Comes from non-employment	0.049*** (0.001)

Notes: This table reports marginal effects from the logit estimation averaged across all observations, and standard errors (in parentheses).

*** Significant at the 1 percent level, ** Significant at the 5 percent level, * Significant at the 10 percent level.

As expected, we see the crisis variable has a negative overall marginal effect on the probability. Whilst the level effect of the crisis variable by itself is not statistically significant, the recession effect is felt in different ways in some of the individuals' characteristics. For example, it attenuates the impact education has on the likelihood of founding a company but the reduction is relatively larger in higher education. As previously stated, this may indicate that more educated individuals become more averse to trying a self-employment venture during a recession because of higher opportunity costs. Figure 4 plots predicted probabilities for the three levels of education, before and during the crisis. It becomes more apparent that, in general, the probability of a college graduate founding a company was more affected by the crisis.

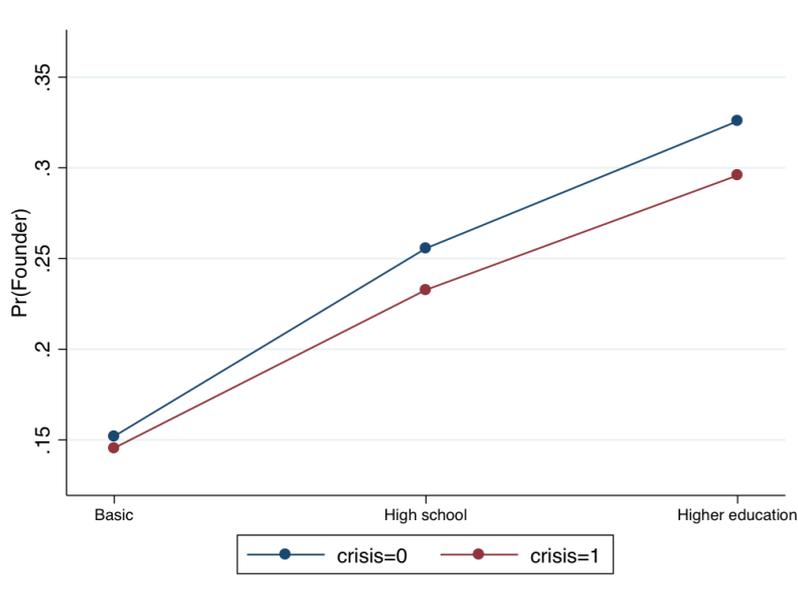


Figure 4 – Predicted probabilities for general specification

Additionally, we find evidence of a *push* effect. The marginal effect for the non-employment variable is positive, indicating that individuals coming from non-employment have a higher probability of becoming entrepreneurs, possibly of the necessity-based kind. The positive effect is further reinforced in the recession period, as the odds ratio for the interaction term suggests.

Our descriptive statistics suggest that the changes in the effects of education in the recession period may be related to the sectors of activity. To further investigate this question, we again estimate the previous model (without sector controls) to the aggregate categories of High technology and knowledge intensity and Low technology and knowledge intensity, which include both manufacturing and services. Table 11 presents the estimate results, and Table 12 has the average marginal effects for the sector level analysis.

TABLE 11 – PROBABILITY OF BEING AN ENTREPRENEUR
HIGH TECH/KNOWLEDGE VS. LOW TECH/KNOWLEDGE SPECIFICATIONS

	High tech/knowledge	Low tech/knowledge
Crisis year	0.827*** (0.043)	0.882*** (0.015)
High School	1.812*** (0.072)	2.208*** (0.035)
High School * crisis	0.998 (0.059)	0.910*** (0.021)
Higher Education	3.285*** (0.124)	3.323*** (0.080)
Higher Education * crisis	1.044 (0.057)	0.877*** (0.031)
Comes from non-employment	1.425*** (0.047)	1.395*** (0.023)
Non-employment * crisis	1.009 (0.041)	1.095*** (0.023)
Number of observations	70,755	287,945
Pseudo R ²	0.281	0.185
Log-likelihood	-29,204.2	-115,913.1
Likelihood ratio chi ²	22,815.7	52,681.0
Prob > chi2	0.000	0.000

Notes: This table reports the logit odds ratios and standard errors (in parentheses) for maximum likelihood estimation of probability of being an entrepreneur, by level of technology and knowledge intensity.

High-tech/knowledge category includes high-tech and medium-high-tech manufacturing and knowledge-intensive services.

Low-tech/knowledge category includes low-tech and medium-low-tech manufacturing and less-knowledge-intensive service.

Regressions also include controls labour market experience, sector experience and experience as business owner, gender, age, log of number of employees in new firm, and sector.

Base case is male, working as a paid employee in a different sector two years prior to analysis year, who did not finish high school.

*** Significant at the 1 percent level, ** Significant at the 5 percent level, * Significant at the 10 percent level.

TABLE 12 – AVERAGE MARGINAL EFFECTS OF 'HIGH VERSUS LOW' SPECIFICATIONS

	High tech/knowledge	Low tech/knowledge
Crisis	-0.022*** (0.003)	-0.016*** (0.001)
High School	0.074*** (0.004)	0.102*** (0.002)
Higher Education	0.164*** (0.004)	0.167*** (0.003)
Comes from non-employment	0.049*** (0.004)	0.048*** (0.002)

Notes: This table reports average marginal effects from the logit estimation averaged across all observations, and standard errors (in parentheses).

*** Significant at the 1 percent level, ** Significant at the 5 percent level, * Significant at the 10 percent level.

While the average marginal effect of the crisis is larger in the high technology and knowledge category, in that sector the interaction terms with education levels are not significantly different from zero. This suggests that in those sectors where general human capital plays a larger role the crisis had no effect on the value of education. On the other hand, in the low technology and knowledge sectors, the negative impact of the crisis on education increases as the education level rises. In Figure 5 we see that the gap between the predicted probability in the pre-crisis period and in the crisis period widens as the education level grows for the low technology and knowledge industries. In the high technology and high knowledge industries there seems to be a slight reduction of the gap.

For both categories, the marginal effect of coming from non-employment is of similar magnitude. Again, while in the high technology and knowledge category there seems to have been no significant change in the non-employment effect during the crisis, in the low technology and knowledge category the impact of coming from non-employment increased in the recession period. Thus, our findings in the general specification, where the crisis negatively affected both the education effect and the non-employment effect, are only present in the low technology and low knowledge category and in the remaining industries that do not belong in either category.

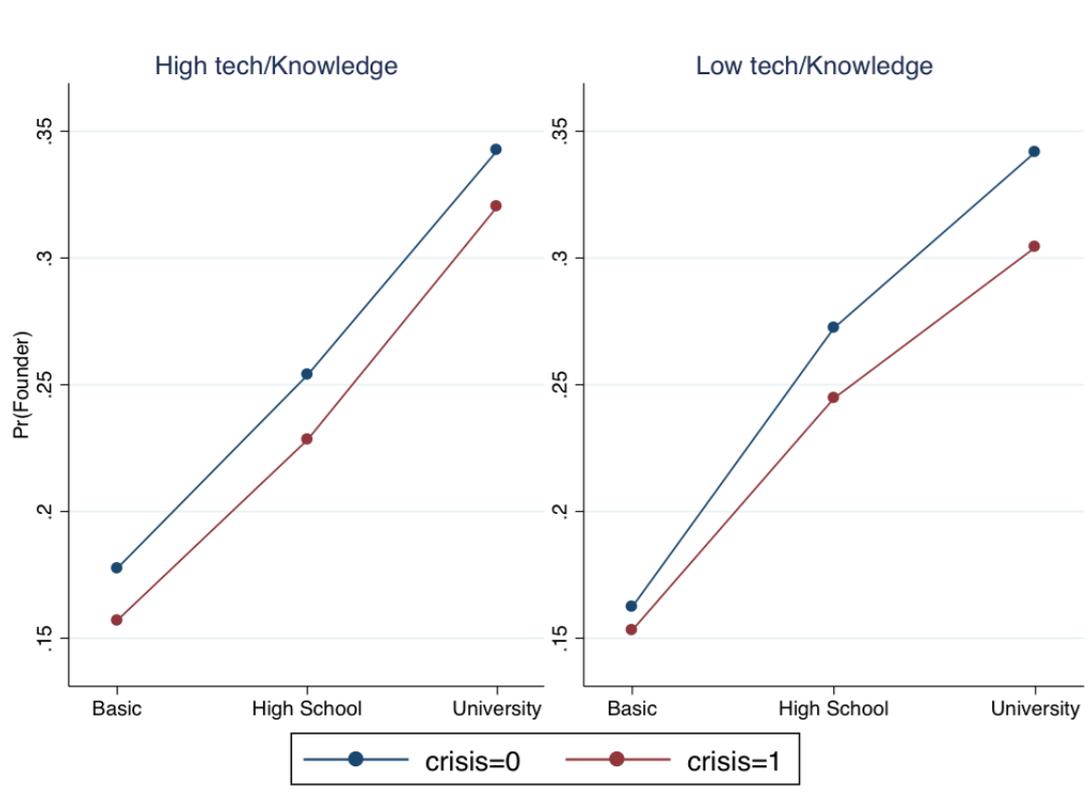


Figure 5 – Predicted probabilities for ‘High versus Low’ specifications

5. Conclusion

In this paper we study profiles of entrepreneurs before and after the crisis, using data for Portugal for the period 2005-2012, in order to investigate if there were changes in the characteristics of individuals starting firms before and after the crisis. More specifically, we analyse the changes in the education patterns of entrepreneurs before and after the crisis.

Our results suggest that the crisis changed the profile of entrepreneurs. In particular, the “push” effect from the crisis seems to be stronger than any increase in perceived risks of self-employment. Our results also show that the observed changes in human capital profiles differ across levels of technology and knowledge intensity. In particular, we only found significant effects of the crisis on education and coming from non-employment in the low technology manufacturing and less-knowledge-intensive services.

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