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Firm creation and employment change at the regional level: assessing entrepreneurs' levels and types of education

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1. INTRODUCTION

Entrepreneurship is considered to be important for job creation and economic development (Audretsch, 2003). Therefore, it has been gaining an increased attention by scholars and policy-makers as a relevant research topic and as a mechanism for addressing economical and labor market issues. For example, academic studies from authors such like Fritsch & Mueller (2004) and Baptista *et al.* (2008) – developed for Germany and Portugal, respectively – examine whether there is a relationship between the new business creation and an increase in employment growth at the regional level. These studies show that the impact of new business formation on regional development is not immediate but, instead, can be delayed in time for a period of about ten years. Investigations carried out in the field of entrepreneurship and regional development bring an additional relevance to the field of entrepreneurship since, according to Swales (1979), regional differences in entrepreneurship may be the explanation of differences in economic performance.

This study aims at empirically identify and examine the main effects of different types of start-ups and business-owners' different educational backgrounds in employment growth, at the regional level. These effects are analyzed and compared within the period 1996- 2007. Specifically the following analyses/econometric estimations are developed:

- i. Start-ups of all sectors;
- ii. Technology based start-ups;
- iii. Knowledge intensive start-ups;
- iv. Start-ups with at least one business owner with tertiary education;
- v. Start-ups with no business owners with tertiary education;
- vi. Start-ups with at least one business owner with higher education on Engineering;
- vii. Start-ups with at least one business owner with higher education on Management.

Assessing the heterogeneity of businesses' – and types of business ownership' - dimensions that bear the potential to generate higher positive impacts on employment growth may bring relevant contribution and implications at various levels. While, in the present investigation, the specific variables under analysis and main results are strongly rooted in the literature and follow valid theoretical approaches and methodologies, there is also an original contribution regarding the use of business owner educational background as variables of interest. Moreover, this potential academic contribution can be equated with a contribution for supporting eventual higher-education and regional development policies aimed at stimulating different types of entrepreneurship and job creation.

The remainder of this paper proceeds as follows: the next chapter (chapter 2) presents and discusses previous theoretical and empirical approaches regarding the interplay between entrepreneurship and job creation, economic development and regional development. Chapter 3 provides information on the data and methodology used for the empirical analysis. Results are presented and discussed in chapter 4, and finally chapter 5 concludes the article, its main limitations and avenues for further research.

2. BACKGROUND

2.1. Job creation & Economic development

The first contribution of new firm formation to employment growth is the number of jobs directly created by new firms to successfully enter the market and grow (Baptista, *et al.*, 2008). However, part of this direct effect can be attributed to the fact that new businesses stimulate job growth in other sectors of the region (Andersson & Noseleit, 2011).

The literature is not consensual regarding the effect of start-up creation on employment. While some argue that unemployment stimulates entrepreneurial activity, another stream of literature concludes that higher levels of start-ups lead to a decrease in unemployment (see Carre & Thurik, 2002 for a detailed review). Furthermore, according with, for example, Blanchflower (2000), there is – among many countries – little evidence of an extant correlation between entrepreneurship and unemployment. Blanchflower (2000) states that while the evidence shows support for a general negative effect, there is also evidence of positive effects for some countries.

Therefore, according to Baptista *et al.* (2008), it is important to take into account the indirect positive supply side effects (spillovers) that the entrepreneurial activity can create, which can generate significant improvements in the competitiveness of a country, region or industry, leading to economic growth. Fritsch & Mueller (2004) provide a more detailed framework and description of such effects:

- i. Efficiency guaranteed – The threat or the effective entry of new business in the market, makes the incumbent firms more efficient
- ii. Structural change accelerated – The entry of new firms and exit of incumbent firms, constitute a turnaround of the respective economic units, leading to structural changes
- iii. Amplified innovation – New companies often introduce radical innovations.
- iv. Greater variety of products – New businesses can introduce innovations in products and processes, which lead to customer needs being met more efficiently. The increase in variety may boost economic development.

2.2. Regional development

According to Audretsch (2003), for studies of entrepreneurship at regional level, the most common and extensively used variable accounting for performance is *growth* – typically measured in terms of employment growth. For the author, the vast majority of this type of research tries to find the link between the start-up rate, as a measure of entrepreneurial activity, and economic growth. Some authors have extended this type of approach to try and measure the impact of new business generation in job creation over time. For example, Fritsch & Mueller (2004), looking at the effects of new businesses' creation on employment at the regional level, concluded that the effects of new firm formation on net employment are small in the year of entry and become negative during the first six years. Positive effects occur, but only after this six-years period, reaching to a maximum peak at around the eighth year and eventually

disappearing after the tenth year. According to the authors (Fritsch & Mueller, 2004), while the initial negative effects are due to failure of new business and exit of incumbents, the positive effects are probably associated with spillovers. The model formalized by the authors to describe this temporal impact on employment development is illustrated as follows:

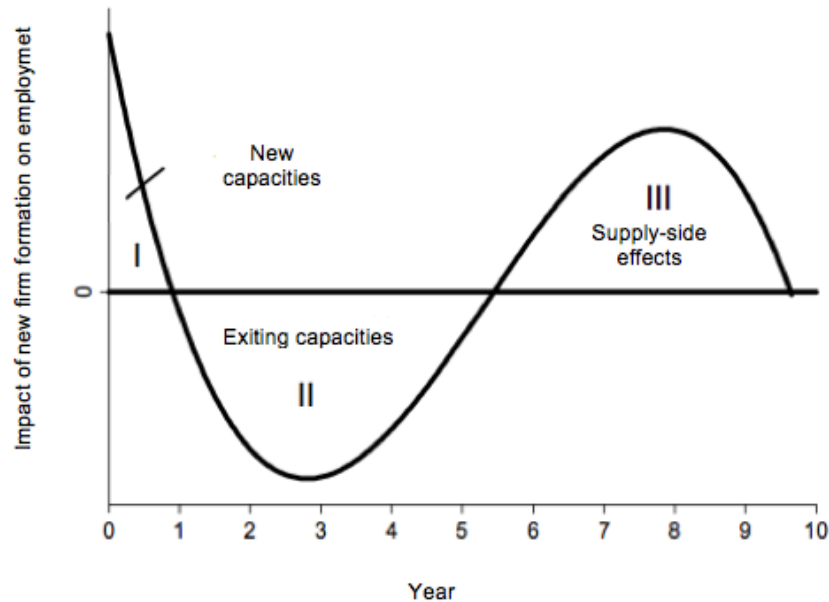


Figure 1 – Direct and indirect effects of new business formation on regional employment growth over time

Baptista & Preto (2009) argue that the higher the entry rate into the knowledge-based sectors is, the higher both job destruction (due to increased competition and exiting capacities) and job creation (due to supply-side effects) will be.

Baptista *et al.* (2008), analyzing the effects of new business creation at the regional level in Portugal, concluded that the indirect effects of this creation, only begin to occur about eight years after the entry of new companies in the market. The authors concluded that these indirect positive effects promote growth and employment within the region, but there is a nine or ten years lag until this effect begins to become observable in the economy.

Following Fritsch & Mueller (2004) and Baptista *et al.* (2008), i.e. taking into account the time intervals found by these authors, Baptista & Preto (2010) address the lag structures of the effects on employment changes, taking into account the formation of different types of new companies, as follows: Start-ups larger than average vs. start-ups smaller than average; Foreign-owned start-ups vs. domestic start-ups; Knowledge-based start-ups vs. other start-ups. Their conclusions were that the creation of new businesses that are larger than average, new companies with foreign capital and new companies in knowledge-based sectors, have considerably stronger positive effects on employment change than their counterparts. The authors also conclude that these types of start-ups seem to be responsible for most of the effects of new firm formation in industrial restructuring and employment growth.

In sum, there are strong evidence that, at the regional level, the creation of new business have a positive impact on job creation and, consequently, on economic development. These effects take place only after a certain period of time, depending on the country.

3. DATA DESCRIPTION AND METHODOLOGY

3.1. Data Set: *Quadros de Pessoal*

The data used in this study come from the micro-data set *Quadros de Pessoal*, which originates from mandatory information submitted annually by Portuguese companies to the Ministry of Labor and Social Solidarity. The information in this data set includes the mobility of companies, establishments, workers and business owners in the period 1986-2009. The data set also includes annual reporting of all private establishments with at least one paid-employee in the Portuguese economy. Therefore, sole traders, or self-employed individuals without employees are not included. Some industries are not included in the data, namely: agriculture, military, government, institutionalized workers. Additionally, as suggested by Parker (2004), and in line with Fritsch & Schroeter (2011), information about start-ups and employment in fishery, energy, mining, railway and postal services because of their highly regulated market conditions will be excluded from the data-set for the present empirical analysis.

Table 1: Data description (mean values for 1996-2006)

Mean (1996-2006) \ Region	Norte	Centro	Lisboa	Alentejo	Algarve	Açores	Madeira
Start-ups of all sectors considered	10.335,8	5.859,2	6.629,2	1.895,8	1.601,8	420,2	638
Technology based start-ups	64,6	65,4	45,4	8,4	5	1,2	1,9
Knowledge intensive start-ups	48,7	32,1	94,5	8,2	6,5	2,3	4,3
Start-ups with at least one business owner with higher education	411,1	251,5	464,4	72,6	63,2	12,9	17,8
Start-ups with no business owners with higher education	5.643,9	3.712,5	3.429,8	1.034,9	927,4	194,9	365,5
Start-ups with at least one business owner with higher education on Engineering	82,6	49,8	85	10,6	8,7	1,8	3,4
Start-ups with at least one business owner with higher education on Management	115,6	65,7	134,5	17,3	14,8	1,6	4,8

Table 1 show that the Norte region has the strongest incidence of firm creation exist, across all industries. Regarding all regions, the creation of technology based and knowledge intensive start-ups account for a small percentage of the total start-ups. The mean values of start-ups with no business owners with higher education attainment are considerably higher than the mean values of start-ups with at least one business owner with higher education for all regions. As observed, for both types of start-ups with at least one business owner with higher education on Engineering or Management, the Lisboa region presents the higher mean values, followed by Norte and Centro.

3.2. Methodology

The activity of new business formation is measured following Baptista *et al.* (2008) and Garofoli (1994). The authors argue that, in order to control for region different sizes, entry rates must be measured using regional work force as denominator (Labor market approach). According to Fritsch & Schroeter (2011) the denominator must be in thousands.

To identify and to analyze the different effects of new business formation on employment, a robust fixed effects estimator is employed. The regional development indicator used is the average change in annual employment. To avoid disturbances due to short-run fluctuations, the average change is calculated over a period of two years (2007-2009) (Baptista, *et al.*, 2008; Fritsch & Mueller, 2004; Fritsch & Schroeter, 2011). The different impacts of different start-up activity on regional employment change are estimated by the regression:

$$\overline{\Delta EMP}_{r,t_0 \text{ to } t_{+2}} = \alpha + \beta_1 \cdot BIR_{r,t_{-1} \text{ to } t_{-10}} + X_{r,t_{-1}} + \varepsilon_{r,t} \quad (1)$$

$\overline{\Delta EMP}_{r,t_0 \text{ to } t_{+2}}$ - average change (percentage) on regional employment between period t_0 and t_{+2} in region r ; $BIR_{r,t_{-1} \text{ to } t_{-10}}$ - start-up rate calculated as a mean over a period of 10 years, from t_{-10} to t_{-1} ; $X_{r,t_{-1}}$ - Control variables; $\varepsilon_{r,t}$ - error term.

The control variables are included to take into account other factors that, beside the start-ups, are also relevant to regional growth. In particular, the population density is included as a variable that represent certain local characteristics that may affect regional growth, such as the wage level, real estate prices, quality of the infrastructure, or qualification and diversity of the labor market (Fritsch & Schroeter, 2011). According to Fritsch & Schroeter (2009) the population density is the most significant regional feature.

Since human capital is an important determinant of regional growth (Glaeser, *et al.*, 1992; Fritsch & Schroeter, 2011), the share of highly skilled employees, i.e., the percentage of workers with higher education is included in the model.

Finally, to correct for the confounding effect of the regional composition of industries on the number of start-ups, a shift-share procedure was employed to obtain a sector-adjusted measure of start-ups activity (for details, see Audretsch & Fritsch, 2002).

4. RESULTS

Table 2 presents our econometric results, using specific start-up rates for different types of start-ups. First, the model was applied taking into account the start-up rate in all industries (Model I). As shown in the results, start-ups throughout all industries have a statistically significant negative effect on the average change in regional employment. Taking as reference the results obtained by Fritsch & Schroeter (2009, 2011), an equally significant impact would be expected, but in contrast, positive.

While Model II includes the Technology-based firms' start-up rate, Model III focuses on the Knowledge Intensive firms' start-up rate. Both rates are included in Model IV. By comparing model II with model III, evidence shows that, for both models, start-ups have a statistically significant effect on the average variation of regional employment and, once again, their coefficients are negative. The impact of Knowledge Intensive start-ups is slightly more negative than the impact exerted by Technology-based start-ups. Combining the both start-up rates in one single model (Model IV), the results do not suffer major changes.

Subsequent analyses focus on business owners' educational level and background. Specifically, Model V includes the rate of start-ups with at least one business owner with higher education and Model V looks at the rate of start-ups without business owners with higher education. As shown, the start-ups with at least one business owner with higher education have a statistically significant negative effect on the average variation of regional employment (Model V). For start-ups without business owners with higher education, there is also a statistically significant and negative impact, on average change in regional employment (Model VI).

Table 2: Employment effects of new business formation differentiated by the type of start-up

	Model I	Model II	Model III	Model IV	Model V	Model VI	Model VII	Model VIII	Model IX
Start-up rate of all sectors considered	-0,0004*** (0,0000)	-	-	-	-	-	-	-	-
Technology based start-up rate	-	-0,0006*** (0,0000)	-	-0,0010*** (0,0000)	-	-	-	-	-
Knowledge intensive start-up rate	-	-	-0,0017*** (0,0000)	-0,0020*** (0,0000)		-	-	-	-
Rate of start-ups with at least one business owner with higher education	-	-	-	-	-0,0086*** (0,0000)		-	-	-
Rate of start-ups with no business owners with higher education	-	-	-	-	-	-0,0002*** (0,0000)	-	-	-
Rate of start-ups with at least one business owner with higher education on Engineering	-	-	-	-	-	-	-0,0179*** (0,0001)	-	-0,0140*** (0,0001)
Rate of start-ups with at least one business owner with higher education on Management	-	-	-	-	-	-	-	-0,0142*** (0,0001)	-0,0128*** (0,0001)
Share of highly skilled employees	0,2291*** (0,0011)	0,2522*** (0,0012)	0,2528*** (0,0012)	0,2532*** (0,0012)	0,2702*** (0,0010)	0,2453*** (0,0011)	0,2578*** (0,0011)	0,2626*** (0,0011)	0,2660*** (0,0011)
Population density	0,0015*** (0,0001)	0,0019*** (0,0001)	0,0020*** (0,0001)	0,0020*** (0,0001)	0,0005*** (0,0001)	0,0017*** (0,0001)	0,0016*** (0,0001)	0,0013*** (0,0001)	0,0011*** (0,0001)
Constant	-0,0154*** (0,0001)	-0,0278*** (0,0001)	-0,0279*** (0,0000)	-0,0276*** (0,0001)	-0,0278*** (0,0001)	-0,0247*** (0,0000)	-0,0270*** (0,0001)	-0,0268*** (0,0001)	-0,0262*** (0,0000)
Control for industry composition	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0,8644	0,8452	0,8453	0,8455	0,8692	0,8559	0,8516	0,8573	0,8610
Number of planning regions	7	7	7	7	7	7	7	7	7

Notes: Standard error in parentheses. *** Statistically significant at the 1 percent level

Finally, different additional estimations are made taking into account the rate of start-ups with at least one business owner with higher education in Engineering (Model VII), the rate of start-ups with at least one business owner with higher education in Management (Model VIII) and the rate of start-ups accounting for both educational backgrounds (engineering and management) (Model IX). Comparing model VII with model VIII, results show that in both models, start-ups have a statistically significant effect on the average variation of regional employment, and, once again, their coefficients are negative. The impact of start-ups with at least one business owner with higher education in Engineering is slightly more negative than the impact exerted by start-ups with at least one business owner with higher education in Management. By analysing both start-up rates within the same model (Model IV), one can observe that the results do not suffer major changes and the effects continue to be statistically significant and negative.

For all different types of start-ups, the R-squared values show that the models explain a large percentage of the variance.

Regarding the control variables, it was found, as expected, a statistically significant positive effect of human capital intensity and population density in regional employment growth in all models. It should be noted that such effects are more positive for the share of highly skilled employees than for the population density. The regional industry structure is also statistically significant for the variation of regional employment, but its coefficient is negative and close to zero.

5. CONCLUSIONS

The economic growth that comes from entrepreneurship through the creation of companies can be translated directly into job creation, or indirectly through the stimulation of efficiency, structural changes in industries, innovation and variety of products that meet consumer needs. There is strong evidence that, at the regional level, the creation of new businesses, stimulate job growth, but such effects are noted only after a few years.

Taking into account the range of 10 years, found previously (Fritsch & Mueller, 2004; Baptista, et al, 2008), an analysis was done on the effects of start-ups of all sectors considered, technology based start-ups, knowledge intensive start-ups, start-ups with at least one business owner with higher education, start-ups with no business owners with higher education, start-ups with at least one business owner with higher education on Engineering and start-ups with at least one business owner with higher education on Management.

As discussed in the literature review chapter, recent studies indicate that there is a positive relationship between the creation of new businesses and subsequent growth in regional employment; however, the results obtained by the empirical analysis do not confirm such conclusions, since the start-ups rate for all sectors considered between 1996 and 2006 is statistically significant, but with a consistently negative effect on the average change in regional employment between 2007 and 2009.

In line with the literature, it would be expected that both the creation of new technology based businesses and of new knowledge intensive companies, would lead to positive effects in employment change. Such assumptions, once again, have not been confirmed. In contrast, it was concluded that in both cases, the rates of start-ups have had statistically significant effects on the average variation of regional employment, and those effects were negative.

The results obtained when considering the rates of start-ups with at least one business owner with higher education or the rates of start-ups with no business owners with higher education, show statistically significant negative effects. The same happened with the rates of start-ups with at least one business owner with higher education in Engineering and the rates of start-ups with at least one business owner with higher education in Management. The latter two rates of start-ups showed the most negative coefficients.

On the other hand, there were significant and positive effects from the share of highly skilled employees and the population density. It might be noted that the share of highly qualified workers resulted in a more positive impact than the population density.

Throughout these results, it was concluded that, for the period under analysis, the start-up rates have had negative impacts on the average variation of regional employment. Accordingly, some attention is needed regarding the implementation of public policies to stimulate entrepreneurship, since high levels of entrepreneurship appear to lead to decreasing effect in job creation.

Regarding the share of highly skilled employees, positive effects on the average change in regional employment have been observed over all models. These results suggest that the greater the percentage of employees with higher education (in relation to the work force) in a given region, the greater the economic development of the region, measured as changes in employment. Thus, the more relevant public policies to analyze and implement entrepreneurial activity with higher potential and, eventually, more opportunity oriented, are those policies relating to the strengthening of skills and capabilities of individuals through education and training.

This study while investigating some of the variables traditionally associated with start-ups and regional employment change, seeks to provide an original contribution by exploring and testing specific variables at the business-owner level, such as educational attainment and background.

Hopefully, this attempt to broaden the spectrum of explanatory variables associated with job generation can bring new perspectives and discussion to the fore and act as an incentive for further studies on the topic. It is also hoped that the present approach and results can facilitate and contribute to decision making with regard to public policies tailored at fostering entrepreneurial activity.

REFERENCES

- Andersson, M. & Noseleit, F. (2011). Start-Ups and Employment Dynamics Within and Across Sectors. *Small Business Economics*, 36 (4), 461-483.
- Audretsch, D. B. (2003). Entrepreneurship: A survey of the literature. *Enterprise Papers*, 14. European Commission: Enterprise Directorate-General.
- Audretsch, D. B. & Fritsch, M. (2002). Growth Regimes over Time and Space. *Regional Studies*, 36, 113-124.
- Baptista, R., Escária, V. & Madruga, P. (2008). Entrepreneurship, Regional Development and Job creation: the Case of Portugal. *Discussion Papers on Entrepreneurship, Growth and Public Policy*, 0605. Jena, Germany: Group Entrepreneurship, Growth and Public Policy.
- Baptista, R. & Preto, M. T. (2009). New firm formation and employment growth: regional and business Dynamics. *Small Business Economics*, 36 (4), 419-442.
- Baptista, R. & Preto, M. T. (2010). Long-term effects of new firm formation by type of start-up. *Int. J. Entrepreneurship and Small Business*, 11 (4), 382-402.
- Blachflower, D. G. (2000). Self-employment in OECD Countries. *Labour Economics*, 7 (5), 471-505.
- Carre, M. A. & Thurik, A. R. (2002). The Impact of Entrepreneurship on Economic Growth. *International Handbook of Entrepreneurship Research*.
- Fritsch, M. & Mueller, P. (2004). The Effects of New Business Formation on Regional Development over Time. *Discussion Papers on Entrepreneurship, Growth and Public Policy*, 3604. Jena, Germany: Group Entrepreneurship, Growth and Public Policy.
- Fritsch, M. & Schroeter, A. (2009). Why does the effect of new business formation differ across region? *Small Business Economics*, 36 (4), 383-400
- Fritsch, M. & Schroeter, A. (2011). Does Quality Make a Difference? Employment Effects of High- and Low-Quality Start-Ups. *Jena Economic Research Papers*, 2011 - 001. Jena, Germany.
- Garofoli, G. (1994). New Firm Formation and Regional Development: the Case of Italy, *Regional Studies*, 28, 381-393.
- Glaeser, E. L., Kallal, H. D., Scheinkman, J. A. & Shleifer, A. (1992). Growth of Cities. *Journal of Political Economy*, 100, 1126-1152.
- Parker, S. C. (2004). *The Economics of Self-employment and Entrepreneurship*. Cambridge: Cambridge University Press.
- Swales, J. K. (1979). Entrepreneurship and regional development: implications for regional policy. *Regional Policy: Past Experience and New Directions*, 225-241.