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## The stimulation of entrepreneurship through venture capital and business incubation

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**Abstract:** This paper studies the influence of venture capital and business incubation in entrepreneurship. A database of start-ups participated by venture capital and/or created in business incubation centres in Portugal was created. Venture capital companies and business incubation centres evaluated the performance of the start-ups that had been created with their support. After that, a questionnaire was distributed to the same start-ups to obtain information on the independent variables. The colinearity of sources was avoided this way. The results confirmed most of the formulated hypotheses, in other words, it was confirmed that venture capital and business incubation contribute positively to the decision of creating a new enterprise and to the survival of the young companies. Betting in a strong venture capital industry and in a good network of business incubation centres are therefore efficient strategies to support the growth of entrepreneurship and to improve the survival rate of start-ups.

**Keywords:** entrepreneurship; regional development; management; innovation; Portugal.

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### 1 Introduction

Entrepreneurship has been growing in the published literature. The increase of the research on entrepreneurship is a recognition of the importance that the phenomenon assumes in the development of the economies, situation already underlined by Schumpeter (1942) around 60 years ago. However, not always a very clear answer has been offered to the question: why study entrepreneurship? The published research supplies us with a list of answers to this question:

- 1 entrepreneurship is a source of creation of jobs, for some authors the most important one
- 2 entrepreneurship is central in the introduction of innovations in the economy and even constitutes the mechanism that makes the economy and the society evolve and progress
- 3 entrepreneurship constitutes an important career option for an important part of the workforce
- 4 entrepreneurship has a very important impact in the regional development and in the growth of the economies.

Regarding the first point, Reynolds et al. (1994) showed that, both in Sweden and in the USA, around half of the jobs created along a period of six years came from the small and middle enterprises (SMEs) created in the same period. Also, in the USA, the small entrepreneurial firms created 3/4 of the new jobs (Henderson, 2002). Palich and Bagby (1995) affirm that the governments look at the new enterprises as the principal vehicles of creation of new jobs, while Allen and Weinberg (1988, p.197) analyse several studies on creation of jobs by the SMEs to conclude for their fundamental weight for this macro-economical variable.

On the second aspect, Reynolds (1994) accents the importance of the new enterprises for the introduction of innovation in an economy, not only for the patents registered, but also for the challenge that they come to constitute for the installed firms. These contributions are corroborated by Arend (1999) who indicates that in the USA, in the 1980s, the small enterprises spent more in R&D than the large corporations and the former created 20 million jobs, while the later contributed to the unemployment with large 'downsizings'. More, according to the same author, the SMEs produced 24 times more innovations for each dollar invested in I&D than the companies listed in the famous Fortune 500. Furthermore, Hamel and Prahalad (1991) affirm that for the great corporations, it is virtually impossible to really be an innovator. The preoccupations with the short term and the bureaucratic infrastructures suffocate the innovation (Drucker, 1985). Barrett et al. (2000) also affirm that the nature of any great organisation is to be hostile to change (homeostasis), in spite of the fact that the biggest organisations have an advantage to innovation because they have more budgets to investigate, they have established systems of distribution, and they can finance and support the risk of the projects. For Arend (1999), to the installed enterprises, it does not interest very often to explore the technological innovations because change can have very high costs ('sunk costs') and pressures to produce results in the short term.

With regard to the third aspect, Henderson (2002) quotes the US Department of Work to say that the self-employed North Americans gain 1/3 more than what the salaried workers and that the entrepreneurs who created an enterprise win still much more. This career option issue is also discussed by Baumol (1990) for whom the most important thing is not the number of entrepreneurs in an economy, but their distribution between different activities: innovation, rent seeking, or even organised crime. The rewards that society offers for each one of these activities make entrepreneurs choose between them, affecting the growth of productivity.

As for the fourth aspect, Reynolds et al. (1994) and Reynolds (1994) came to show that, in USA, high rates of new enterprises creation were, in the period analysed, a necessary condition though not sufficient for economical growth. Moreover, Reynolds et

al. (1994) and Reynolds and Maki (1991) concluded that the creation of enterprises nearly always accompanies economical growth. Even more important, Davidsson and Wiklund (1997), Reynolds (1994), Reynolds and Maki (1991) and Reynolds et al. (2002) show that more than 25% of the variation in growth in the industrialised countries is explained by the differences in new companies creation. In the same sense, Henderson (2002) thinks that the value of the entrepreneur is obvious both in the national level and in the regional or local level. At the national level, he checked that the nations with more enterprising activity have a higher GNP growth. More, he says that entrepreneurship explains a third of the difference of growth between countries. The same author also considers that the relation between entrepreneurship and growth is stronger in countries that depend more on the international commerce and it adds that the small enterprising enterprises are the ones who grow more in USA's exports and that between 1987 and 1997 the value of the exports from SMEs triplicated. Finally, he affirms that the local entrepreneurs re-invest their profits locally more than the great enterprises.

Finally, it is worth quoting the Nobel Prize winner Hayek, like Domínguez (2002) does, when he defines the entrepreneur as the key for development. If it was not for another motive, this conviction was enough to be worthwhile studying this subject.

All these reasons put in evidence the considerable importance of entrepreneurship for the development of a region or a country, so justifying the realisation of this study.

This justification is reinforced by the shortage of studies on entrepreneurship in Portugal and by the absence of known studies about the relation between entrepreneurship, venture capital, and business incubation, in spite of the published literature indicating that it is an important phenomena, since it can assume several characteristics and several weights in different regional and national contexts and at different moments in history (Audretsch and Fritsch, 2003).

In the case of Portugal, it becomes important to study the ways to stimulate the development of entrepreneurship, since it is a country with one of the lowest rate of enterprising activity, between the 34 analysed for the GEM in 2004 (Sociedade Portuguesa de Inovação, 2001) and it even registered a reduction in this rate from 2001 to 2004.

GNP growth has been systematically under European Union (EU)'s average, since the year 2000. This is an important deception, since the country finished the century converging both nominally and in real terms with the EU. After the entrance of the Eastern European countries in the EU, Portugal has been surpassed by many of these countries and politicians despair for solutions to increase entrepreneurial activity, as a way to boost economic growth in the country. This is when the question of 'how' appears. How to increase entrepreneurial activity?

This work was designed to study the influence of venture capital and business incubation in entrepreneurship in Portugal, namely in one of its expressions, the creation of enterprises.

With this idea in sight, this paper is going to analyse the value of these two resources to the creation of new enterprises. Do they contribute to the entrepreneur's decision to create his enterprise? Do they reduce the probability of bankruptcy for the young company?

According to Gartner (1989), the fact that the definition of entrepreneurship is not consensual in the published literature recommends that each investigator sets out clearly the sense he/she gives to the concept in his work. So, in this paper, entrepreneurship is

defined this way: ‘creation of a new enterprise to explore a business opportunity by entrepreneurs able to, through his social nets, gather the necessary resources’.

The definition of entrepreneur is: ‘individual who, by himself or with partners, creates a new enterprise he is going to manage, at least, in its start-up stage’.

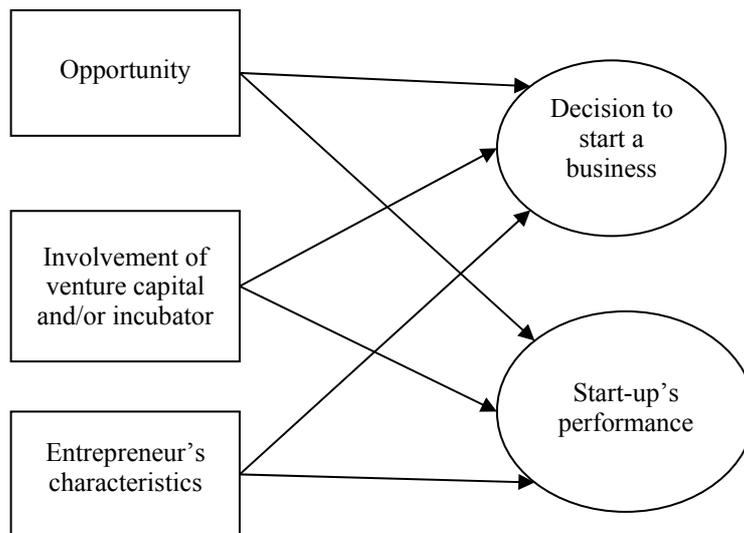
## 2 The design of the research

The present paper is built in an epistemological perspective of constructing a new theory, since its justification is, above all, the necessity of finding ways to develop entrepreneurship. The main question it wants to analyse is: do venture capital and business incubation centres contribute, in Portugal, to promote entrepreneurship and to improve the survival rate of start-ups?

This paper follows a methodology based on the formulation of hypotheses from the published literature, supported by a contingencial model. These hypotheses will be tested through an empirical study. A documental research was performed with the objective of identifying and studying the works published on this subject.

From this survey of the published literature and from the formulated hypotheses, the next model was derived to guide the research:

**Figure 1** Model to be tested



The used method is explicative and an empirical inquiry was developed for gathering primary quantitative data. The type of knowledge that was intended to produce will serve to better understand the phenomenon of entrepreneurship and to contribute to the construction of a theory on the influence that venture capital and business incubation have on it.

An empirical cross-sectional research was made, with the focus in the process, which was developed in two phases. In the first one, data on the dependent variable, i.e., on the decision to start a company and on the start-up's performance was gathered from venture

capital firms and from business incubation centres. In the second phase, information was gathered from these start-ups on three groups of independent variables:

- the involvement and participation of venture capital and/or business incubators in the creation and management of start-ups
- the opportunities that the start-ups try to explore
- the entrepreneur's profile.

With this strategy of gathering empirical data, it was possible to avoid one of the problems more frequently quoted in the research in entrepreneurship, the colinearity of the sources.

The results of four questionnaires were used like the basic source for this analysis, two applied to the whole population of venture capital companies and of incubators in Portugal, and two applied to a sample of start-ups created in Portugal with resource to venture capital and/or to business incubation.

To test the model and the hypotheses, primary information was gathered in two phases. In the first phase, two questionnaires were distributed by all the enterprises of venture capital and by all the business incubation centres in activity in the country. These questionnaires were structured from the published literature and the prior exploratory study and from structured interviews with venture capital and business incubators officials and with entrepreneurs. In the second phase, two other questionnaires were applied, developed likewise, to the start-ups created with resource to venture capital and/or to an incubator, which contacts were obtained in the first phase.

Of the universe of 28 venture capitals and 35 business incubation centres, 15 venture capitals and 18 incubators (52% of the total universe) answered to the first phase of this work.

These 33 enterprises indicated 128 start-ups (38 with venture capitals and 90 incubated), of which 35 created with venture capital and 84 incubated answered (92%). It was with this sample of 119 start-ups that the second phase was developed.

For the resolution of the end question of this paper, according with the adopted methodology and in the sequence of the already above-mentioned recommendations of the literature, six hypotheses of causal nature were proposed for test:

- h.1 The use of venture capital increases the probability of start-up.
- h.2 The resource to a business incubator increases the probability of start-up ( $y_1$ ).
- h.3 The involvement of the venture capital company in the creation and management of the start-up ( $x_{1i}$ ) has a positive influence in its performance and, so, reduces its mortality ( $y_2$ ).
- h.4 The involvement of the business incubators in the creation and management of start-up ( $x_{1i}$ ) has a positive influence in its performance and, so, reduces its mortality ( $y_2$ ).
- h.5 The attributes (or profile) of the entrepreneur ( $x_{2i}$ ) have a positive influence in the performance of the start-up ( $y_2$ ).
- h.6 The type of opportunity ( $x_{3i}$ ) has an influence in the performance of the start-up ( $y_2$ ).

### **3 Results**

The results obtained are used to analyse the six hypotheses in the following way:

#### *3.1 Hypothesis 1*

A high percentage (74%) of the entrepreneurs in this sample, who created their enterprise with support of venture capital, declared that they would not have done it if they could not have that support.

In this case, the data obtained in this empirical study seems to confirm this hypothesis, in other words, the results indicate a confirmation of the existence of a relation between the resource to venture capital and the creation of start-ups.

This result confirms the indications of the preliminary interviews with venture capital officers, who also stressed the importance venture capital can have on entrepreneur's decision to realise their projects and create their start-ups.

On the other side, this conclusion comes in the line of the conclusions obtained in the study carried out by the European Venture Capital Association, on a Pan-European sample of great dimension, in which 94.5% of the questioned entrepreneurs answered that without the support of venture capital, they would not have created their companies.

#### *3.2 Hypothesis 2*

A high percentage (87%) of the entrepreneurs in this sample, who created their enterprise with support of an incubator, declared that they would not have done it if they could not have that support.

The data obtained in this empirical study seems to confirm this hypothesis. In other words, the results indicate a confirmation of the existence of a relation between the resource to business incubation and the creation of new enterprises.

This result confirms the indications of the preliminary interviews with business incubation officers, who also stressed the importance incubation centres can have on entrepreneur's decision to realise their projects and create their start-ups.

It is also in line with the published literature. In the study of Carroll (1986), only 13% of the questioned enterprises, in the state of the Pennsylvania (EUA), affirmed that they would not have begun the business without the incubator, but much was the research that pointed to the importance of the incubators in the creation of the start-ups (Carroll, 1986; OECD, 1999; Sherman, 1999).

#### *3.3 Hypothesis 3*

To test this hypothesis, a regressive analysis was performed. The explicative variables were  $x_1$ ,  $x_2$ , and  $x_3$ , and the dependant,  $y_2$ . A factor analysis was previously done with the objective to identify strengths (factors) that were common (were behind) to these variables and so reduce the number of explicative variables. However, this effort did not turn in the identification of common factors and the analysis factorial was abandoned.

**Table 1** Regression in the venture capital sample

Model summary (g)										
Model	R	R square	Adjusted R square	Std. error of the estimate	Change statistics					Durbin-Watson
					R square change	F change	df1	df2	Sig. F change	
1	.521 (a)	0.272	0.246	0.86859344	0.272	10.438	1	28	0.003	
2	.742 (b)	0.551	0.517	0.69471072	0.279	16.771	1	27	0	
3	.787 (c)	0.619	0.575	0.65170292	0.069	4.681	1	26	0.04	
4	.841 (d)	0.707	0.661	0.58263674	0.088	7.529	1	25	0.011	
5	.871 (e)	0.758	0.708	0.54056929	0.051	5.042	1	24	0.034	
6	.893 (f)	0.797	0.744	0.50645442	0.038	4.342	1	23	0.048	2.111

Notes: a Predictors: (constant), gerência

b Predictors: (constant), gerência, estratégia

c Predictors: (constant), gerência, estratégia, CR/Incub

d Predictors: (constant), gerência, estratégia, CR/Incub, Zscore (sector)

e Predictors: (constant), gerência, estratégia, CR/Incub, Zscore (sector), locus controlo

f Predictors: (constant), gerência, estratégia, CR/Incub, Zscore (sector), locus controlo, Zscore (fundos)

g Dependent variable:  $y_2$  (0.43 management + 1.252 strategy + 0.704 services + 0.912 sector + 0.613 locus of control + 0.201 funds).

**Table 2** Regressive analysis in the venture capital sample

ANOVA (g)					
Model	Sum of squares	df	Mean square	F	Sig.
6	23.101	6	3.85	15.01	.000 (f)
	5.899	23	0.256		
	29	29			

Coefficients (a)						
Model	Unstandardised coefficients		Standardised coefficients		Collinearity statistics	
	B	Std. error	Beta	t	Sig.	Tolerance VIF
	(Constant)	-9.04E-16		0	1	
	Gerência	0.43	0.101	4.252	0	0.863
	Estratégia	1.252	0.182	6.866	0	0.266
	Serviços	0.704	0.17	4.137	0	0.306
	Sector	0.912	0.242	3.768	0.001	0.151
	Locus controle	0.613	0.235	2.609	0.016	0.16
	Fundos	0.201	0.096	2.084	0.048	0.955

Notes: f Predictors: (constant), gerência, estratégia, serviços, sector, locus controle, fundos  
g Dependent variable:  $y_2$  (0.43 management + 1.252 strategy + 0.704 services + 0.912 sector + 0.613 locus of control + 0.201 funds).

Note: a Dependent variable:  $y_2$  (0.43 management + 1.252 strategy + 0.704 services + 0.912 sector + 0.613 locus of control + 0.201 funds).

The analysis demonstrates, first of all, that the independent variables managed to explain a very high percentage of the variation in the dependent variable (adjusted  $R^2$  superior to 74%). This conclusion can be withdrawn with some confidence, since the 'F' indicator assumes values above the demanded minimum (15 against 2.37). The analysis of the indicators of multicollinearity, namely the 'tolerance' and the variance inflation factor (VIF), allows the conclusion that this problem does not exist in this regressive analysis.

In the second place, this regressive analysis revealed the existence of a statistically significant relation between some of the sub-variables of the group  $x_{1i}$  (involvement of venture capital in the management of the start-ups during the creation phase) and its performance.

The positive coefficients of the sub-variables  $x_{122}$ ,  $x_{131}$ ,  $x_{14}$ , and  $x_{18}$  (in other words, the involvement of venture capital in the preparation of candidatures to European funds, the representation of venture capital in the management of the start-up, the management support services rendered in general, and in the area of strategy) and the values of the student's t test, above the minimum value (1.64), which show the existence of a positive influence of these sub-variables in  $y_2$ .

In other words, regarding  $x_{1i}$ , the involvement of venture capitals in the creation and in the management of the start-up revealed a significant capacity of explaining the variation in the performance of the start-ups created with resource to venture capital, through four of the sub-variables:

- the involvement of venture capital in the preparation of candidatures to European funds ( $x_{122}$ )
- the representation of venture capital in the management of the start-up ( $x_{131}$ )
- in general management support services ( $x_{14}$ )
- in management support services in the area of strategy ( $x_{18}$ ).

It is noticed that this regressive analysis did not reveal the existence of a constant in the model, which allows saying that the performance of the start-ups has a strong dependence of the set of explicative variables, not presenting 'fixed' values (neither positives nor negatives).

It is possible to conclude that this hypothesis was confirmed by the empirical study, since the empirical data revealed the existence of a positive influence of the involvement of venture capital in the management of the start-up in its performance and, so, in its survival.

This result came to confirm the study of Zacharakis et al. (1999), which concluded that the start-ups supported by venture capital registered levels of mortality inferior to others.

It is still registered that several sub-variables relative to the involvement of venture capitals in the creation of the start-ups revealed not to have any statistically significant effect in the performance of start-ups:

- the collaboration in the preparation of business plans –  $x_{11}$
- the collaboration in raising bank financing –  $x_{121}$
- the participation in the start-ups' board and fiscalisation structure –  $x_{132}$  and  $x_{133}$
- in management support services, in the area of technology –  $x_{15}$

- in management support services, in the area of administrative organisation –  $x_{16}$
- in management support services, in the area of financial management –  $x_{17}$
- in management support services, in the area of marketing –  $x_{19}$ .

### 3.4 Hypothesis 4

To test this hypothesis, in the same way, a regressive analysis was performed using all the original variables as explicative and the sample of incubated start-ups. As before, a factor analysis was previously performed with the objective of identifying strengths (factors) that were common (were behind) to these variables and so reduce the number of explicative variables. However, this effort did not turn in the identification of common factors and the analysis factorial was abandoned.

The analysis of these charts shows, first of all, that the independent variables managed to explain a moderate percentage of the variation in the dependent variable ( $R^2$  adjusted superior to 34%). This conclusion can be withdrawn with some confidence, since that the indicator 'F' assumes values above the demanded minimum (36.88 against 2.1). The analysis of the indicators of multicollinearity, namely the 'tolerance' and the VIF, turns in the conclusion that this problem does not exist in this regressive analysis.

In the second place, this regressive analysis revealed the existence of a statistically significant connection between some of the sub-variables of the group  $x_{1i}$  (involvement of the incubator in the management of the start-ups during the creation phase) and its performance.

The positive coefficient of the sub-variable  $x_{11}$  (in other words, the involvement of the incubator in the preparation of the business plan) and the values of the student's t test, above the least demanded value (1.64), show up the existence of a positive influence of that variable in  $y_2$ .

In other words, regarding  $x_{1i}$ , the involvement of the incubators in the creation and in the management of the start-up revealed a significant capacity of explaining the variation in the performance of the start-ups created in incubators through the following sub-variable:

- the involvement of the incubator in the preparation of the business plan –  $x_{11}$ .

It is also noticed that this regressive analysis did not reveal the existence of a constant in the model, so we can say, also in this case, that the performance of the start-ups has a strong dependence of the set of explicative variables, not presenting any 'fixed' values (neither positives nor negatives).

It is possible to conclude that this hypothesis was confirmed, since the empirical data revealed the existence of a positive influence of the involvement of the business incubator in the management of the start-up in its performance and, so, in its survival.

Regarding  $x_1$ , the only sub-variable that turned out to be statistically significant was the one that measured the involvement of the incubator in the preparation of business plans. All the remainder revealed not to have any statistically significant effect in the performance of the start-ups.

**Table 3** Regression in the incubated sample

<i>Model summary (b)</i>										
<i>Model</i>	<i>R</i>	<i>R square</i>	<i>Adjusted R square</i>	<i>Std. error of the estimate</i>	<i>Change statistics</i>					
					<i>R square change</i>	<i>F change</i>	<i>df1</i>	<i>df2</i>	<i>Sig. F change</i>	<i>Durbin-Watson</i>
1	.599 (a)	0.358	0.349	0.80699406	0.358	36.881	1	66	0	2.187

Notes: a Predictors: (constant), plano negócio

b Dependent variable: y<sub>2</sub> (0.599 business plan).

**Table 4** Regressive analysis in the incubated sample

<i>ANOVA (b)</i>								
<i>Model</i>	<i>Sum of squares</i>	<i>df</i>	<i>Mean square</i>	<i>F</i>	<i>Sig.</i>			
1	24.018	1	24.018	36.88	.000 (a)			
	42.982	66	0.651					
	67	67						
Notes: a Predictors: (constant), plano negócio								
b Dependent variable: $y_2$ (0.599 business plan).								
<i>Coefficients (a)</i>								
<i>Model</i>	<i>Unstandardised coefficients</i>		<i>Standardised coefficients</i>		<i>t</i>	<i>Sig.</i>	<i>Collinearity statistics</i>	
	<i>B</i>	<i>Std. error</i>	<i>Beta</i>	<i>Partial</i>			<i>Tolerance</i>	<i>VIF</i>
1	(Constant)	1.30E-15	0.098		0	1		
	Plano negócio	0.599	0.099	0.599	6.073	0	1	1
Note: a Dependent variable: $y_2$ (0.599 business plan).								

**Table 5** Regression in the total sample

<i>Model</i>	<i>R</i>	<i>R square</i>	<i>Adjusted R square</i>	<i>Std. error of the estimate</i>	<i>Change statistics</i>				<i>Durbin-Watson</i>	
					<i>R square change</i>	<i>F change</i>	<i>df1</i>	<i>df2</i>		<i>Sig. F change</i>
1	.336 (a)	0.113	0.105	0.94598226	0.113	14.861	1	117	0	
2	.423 (b)	0.179	0.165	0.91383733	0.066	9.376	1	116	0.003	
3	.465 (c)	0.216	0.195	0.89699351	0.037	5.397	1	115	0.022	1.457

Notes: a Predictors: (constant), fondos

b Predictors: (constant), fondos, outras antes

c Predictors: (constant), fondos, outras antes, banca

d Dependent variable:  $y_2$  (0.232 fondos + 0.295 others before + 0.197 banks).

**Table 6** Regressive analysis in the total sample

ANOVA (b)						
Model	Sum of squares	df	Mean square	F	Sig.	
3	Regression	25.471	3	8.49	10.552	.000 (c)
	Residual	92.529	115	0.805		
	Total	118	118			

Notes: c Predictors: (constant), fondos, otras antes, banca  
 b Dependent variable: y<sub>2</sub> (0.232 funds + 0.295 others before + 0.197 banks).

Coefficients (a)						
Model	Unstandardised coefficients		Standardised coefficients		t	Sig.
	B	Std. error	Beta	Tolerance		
3	(Constant)	-6.78E-16	0.082		0	1
	Fondos	0.232	0.087	0.232	2.673	0.009
	Otras antes	0.295	0.086	0.295	3.432	0.001
	Banca	0.197	0.085	0.197	2.323	0.022

Note: a Dependent variable: y<sub>2</sub> (0.232 funds + 0.295 others before + 0.197 banks).

### 3.5 Hypothesis 5

To test this hypothesis, a regressive analysis was performed using as explicative all the original variables and the total sample. Also in this case, a factor analysis was previously performed with the objective to identify strengths (factors) that were common (were behind) to these variables and so to reduce the number of explicative variables. However, this effort did not turn in the identification of common factors and the analysis factorial was abandoned.

The independent variables managed to explain a modest percentage of the variation in the dependent variable ( $R^2$  superior to 19%). This conclusion can be withdrawn with some confidence, since the indicator 'F' assumes values above the demanded minimum (10.55 against 1.8). The analysis of the indicators of multicollinearity, namely the 'tolerance' and the VIF, turns in the conclusion that this problem does not exist in this regressive analysis.

In the second place, this regressive analysis revealed the existence of a statistically significant connection between some of the sub-variables of the group  $x_{2i}$  (profile of the entrepreneur) and the start-up's performance ( $y_2$ ).

The positive coefficient of the sub-variable  $x_{28}$  and the values of the student's t test above the least demanded value (1.64) show the existence of some influence of the entrepreneurs' profile on the performance of their start-ups, which confirms the results of Brüderl et al. (1992) and of Lillo and Lajara (2002).

So, it is noticed that the only sub-variable of the group  $x_{2i}$  that turned out to be statistically significant is one of the measures of the entrepreneurs' human capital.

These results indicate the existence of a causal relation between the entrepreneurs' human capital and the performance of the enterprises they create. The start-ups' survival probability is stronger when the entrepreneurs' experience in the sector is higher.

Also, this regressive analysis did not reveal the existence of a constant in the model.

It is possible to conclude that this hypothesis was confirmed, in a very limited form, given that the empirical data revealed the existence of a positive influence of the entrepreneurs' profile in the performance of their start-ups.

### 3.6 Hypothesis 6

To test this hypothesis, a regressive analysis was performed using as explicative all the original variables and the total sample. This analysis did not reveal any statistically significant relation between the type of explored opportunity and the start-ups' performance.

## 4 Discussion

This empirical study came to confirm most of the hypothesis that had been formulated, which are:

- r.1 It indicated that the resource to venture capital increases the probability that the entrepreneur will start his enterprise, as the entrepreneurs of the sample recognised, admitting (74%) that they would not have created it without this support.

- r.2 It also indicated that the resource to a business incubator has the same effect, such as recognised by 87% of the entrepreneurs of this sample who created their enterprise resorting to this support.
- r.3 It confirmed that venture capital's level of involvement in the creation and management of the start-ups has a positive influence in their performance, namely through management support services, as was demonstrated by the regressive analysis, with the positive and statistically significant coefficients of the variables  $x_{14}$ ,  $x_{18}$ ,  $x_{131}$ , and  $x_{122}$ . In other words, the resource to management support services in general and in the area of strategy, given by venture capitals, demonstrated to have positive influence in the performance of the start-ups. The same thing happened with the representation of venture capitals in the management of the start-up or its participation in the fund raising, through the realisation of candidatures to European funds.
- r.4 It confirmed likewise that the level of involvement of the incubators in the creation and management of the start-ups has the same effect in their performance, as was demonstrated by regressive analysis, with the positive and statistically significant coefficients of the variable concerning to the participation of the incubator in the preparation of the start-ups' business plan ( $x_{11}$ ).
- r.5 It confirmed also that the profile of the entrepreneur has a positive influence in the performance of the created, such as was demonstrated by the regressive analysis, with the positive and statistically significant coefficients of the entrepreneurs' locus of control ( $x_{210}$ ).
- r.6 Finally, it did not show any influence from the type of opportunity on the start-up's performance.

Given that the hypotheses in test in this paper were mostly confirmed, it is possible to propose the next contributions:

- c.1 The resource to the support of venture capital and/or of business incubation, in Portugal, increases the hypotheses that the entrepreneur actually starting a new business.
- c.2 The level of involvement of venture capital and/or of the business incubation in the creation and management of the start-ups has, in Portugal, a positive influence in their performance and, so, reduces their mortality.
  - c.2.1 In particular, management support services and representation in management showed a positive influence on the start-ups' performance.
- c.3 The entrepreneur's profile has, in Portugal, equally a positive influence in the performance of the start-ups, in particular his locus of control.

From the confirmation of the hypotheses, it is possible to make some suggestions on policies to develop entrepreneurship:

- 1 setting up a good network of incubators will be an effective way of promoting entrepreneurship
- 2 developing a strong venture capital industry will also be an effective way of promoting entrepreneurship

- 3 campaigns encouraging entrepreneurs to use both resources will be a third possible policy to increase entrepreneurship.

## **5 Conclusions**

The collected and analysed information allows us to conclude that, in Portugal:

- 1 the activity of these industries (venture capital and business incubation) contributes positively to increase the rate of entrepreneurship in the economy
- 2 venture capital and business incubation contribute positively to the reduction of the start-ups' mortality.

From here, it is possible to conclude, as a proposal, that venture capital and business incubation are very valid instruments for the stimulation of entrepreneurship and for the reduction of the start-ups' mortality.

This is a particularly important conclusion if one considers the low level of entrepreneurship registered in Portugal (Reynolds et al., 2001) and the importance that entrepreneurship assumes for the economical and social development of a country.

From a political point of view, these instruments are an alternative for the economical authorities who recently lost the possibility to use the exchange, monetary, and, in great part, budgetary policies to stimulate the economy.

Relatively to venture capital, these are particularly important conclusions because in Portugal, the number of enterprises that receive support from venture capital is very low when compared with what happens in other countries (Reynolds et al., 2001).

Regarding business incubation, these conclusions confirm and reinforce the recommendations of the Sociedade Portuguesa de Inovação (2001) study, which showed that this is a particularly important instrument for the growth of entrepreneurship in our country (together with the formation in entrepreneurship).

From the point of view of the entrepreneur, it is possible to assume that the resource to one or to both of these instruments can increase the probability that he will start his company and, especially, the survival's probability of his start-up.

Finally, from the point of view of venture capitals and of the business incubation centres, the results of this study point to:

- 1 the need to analyse the entrepreneurs' profile when they select projects to invest in
- 2 when these projects pass to the implementation phase, it seems that the most important thing they can do is to provide high quality management support services to the enterprises that they support.

Another conclusion of the empirical study presented in this paper is the existent separation between the industries of venture capital and business incubation in Portugal, since in the sample not even one start-up was created with support of both. This empirical result came to confirm the indications supplied in the interviews previously carried out with managers of both industries and of start-ups created with support of one or the other.

These results confirm partially the published research. However, none of the known studies was focusing specifically on the influence of venture capital and/or business incubation in entrepreneurship and in the mortality of start-ups.

This work confirmed, in a limited way, the positive relation between the profile of the entrepreneur (namely the human capital of which he disposes) and the performance of the start-ups, previously identified by Lillo and Lajara (2002), which hardly means that has contributed to confirm the ‘traits’ theory. On the contrary, most of the variables relative to the profile of the entrepreneur, including his human capital, did not turn out to be significant to explain the variance in the dependent variable (the start-ups’ performance).

This study did not confirm the relation, proposed but not tested by Ardichvili et al. (2003), between the type of opportunity and the performance of the start-ups.

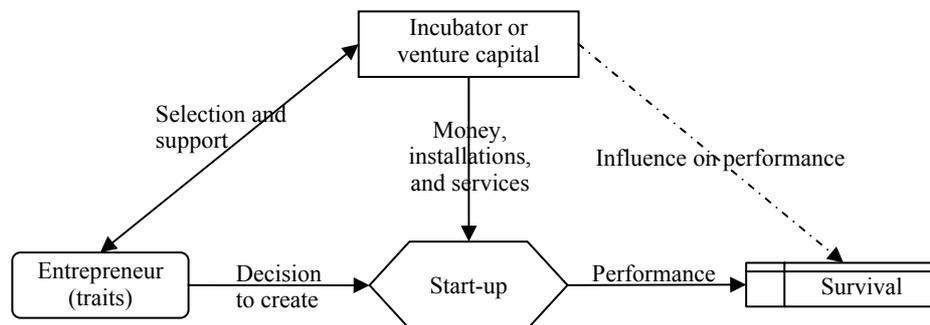
It also confirmed the relation between business incubation and entrepreneurship, proposed by the Sociedade Portuguesa de Inovação (2001), when it proposes that the resource to the support of an incubator increases the probability that the entrepreneur will take the decision to start his new enterprise.

From this work, we can withdraw as the principal conclusion that the resource to venture capital and to business incubation:

- 1 contributes positively to the growth of entrepreneurship because it increases the probability that the entrepreneur will create his enterprise
- 2 it contributes to the survival of start-ups, given that it improves their performance.

The influence of venture capital and of the incubation in the performance of the start-ups can be seen in the following way:

**Figure 2** Model of influence of venture capital and of business incubation in entrepreneurship



The entrepreneur looks for the support of a venture capital company and/or of an incubator. His profile and the type of opportunity that he developed will lead to his proposal selection, or not.

In the case of selection, the probability of creation grows significantly, situation in which venture capital and/or the incubator will be going to contribute in several forms to the creation and start-up of the new enterprise, namely through the rental of installations, the realisation of capital, and the production of management support services.

The start-ups’ survival will result from a performance satisfactory for the shareholders/partners, being that this performance is indirectly influenced (hence, the dotted line) by the support of venture capital and/or incubator and by the profile of the entrepreneur, namely by the human capital of which it disposes.

It is proposed, so, as a contribution of this paper that these two types of support contribute to develop the creation of new enterprises and both influence positively the start-ups’ performance, so reducing their mortality.

They can so be considered as interesting instruments for the development of the economy and of the society, especially in these days when the countries in the 'euro zone' are losing progressively the possibility to use the 'classic' instruments to manage the economy (exchange rate, rate of interest, emission of coin, fiscal policies). The stimulation of entrepreneurship through venture capital and business incubation to develop the economy through the supply side is therefore a political option that can prove to be important in the near future.

For these reasons, it is suggested to the political authorities to use venture capital and business incubation as a way to develop the economy and the society, through the growth of entrepreneurship and through the reduction of the start-ups' mortality.

It must also be suggested to entrepreneurs that resourcing to venture capital companies or business incubation centres can be a considerable advantage. It will help creating a new firm and it will increase its survival chances, in part, thanks to management support services.

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