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Survival drivers of post-incubated start-ups: the effect of academic governance

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ABSTRACT

Incubators, spin-offs, industrial networks and consortiums are some of the examples to build-up university-industry links in fostering innovation. University incubators are well known for supporting the growth of start-ups by providing knowledge and research, as well as, sustaining entrepreneurship by the direct involvement of their Faculty. In this regard, the aim of this paper is to examine the influence of Faculty members on the financial performance of a sample of New Technology Based firms which have been previously incubated by different Italian University Incubators. Essentially, the results on the presence of academic governance in relation to the financial performance of the firm describe a certain dip, even when controlling for other variables such as the industry and the number of registered patents.

JEL Classifications: O32; I23; D02

Keywords: University Incubators, Academic entrepreneurship, Firms, Innovation

1. Introduction

It is evident that higher education institutions contribute to innovation growth and business development by the creation of laboratories and research centres, as well as, by launching of incubators, scientific/technological parks and through specific consortiums/networks. Such activities provide effective technology transfers which lead to formation and commercialization of new ideas and science advances. Incubators and scientific parks offer different advantages to start-up firms (i.e. location and offices, laboratories, administrative and logistic services, etc.) and provide, definitely, a good environment for the creation and the development of new ideas.

Usually incubators take care of newly created firms during their early start-up, after usually two-three years such firms are supposed to become more mature and leave the incubation phase. Therefore, given their specific survival and innovation skills, once the incubator has been left, some firms gain in financial performances while others do not. Although there are many possible internal and external environmental factors which lead to different financial performance. The aim of this paper is to understand the presence of University Faculty Members (UFM) in relation to the financial performance of the firm i.e. the outcome of their involvement in the governance of innovative incubated firms.

The remainder of the paper is structured as follows: the second section reviews the literature and leads to the hypothesis development in section three; the forth section presents the methodology; findings and discussions are presented in the fifth section; the sixth and last section concludes the study and discusses some possible limitations and suggestion for further research.

2. Literature review

Besides the majority of corporate governance studies' the focus is on large public companies (Forbes and Milliken 1999), where a growing number of scholars

investigate small and medium entrepreneurial firms with detailed attention on the role played by many innovation factors such as university-industry links, regional contexts and policy making (Huse 2000, Forbes et al. 2006). However, the current literature on academic entrepreneurship remains rather fragmented and doesn't point to a dominant paradigm (Audretsch et al. 2007, Siegel et al. 2007, Smith and Bagchi-Sen 2012). Hence, there is lack of well-established theoretical grounds and the few longitudinal studies in mainstream scholarly journals (Sexton and Smilor 1997, Rothaermel et al. 2007).

However, Rothaermel (Rothaermel et al. 2007) tried to provide an overarching framework to encompass the different pieces that become viable literature on university entrepreneurship (i.e. university licensing and patenting, spin-offs, science parks, incubators, technology transfer offices, etc.). According to their study, four major research areas emerged in the field of university entrepreneurship, namely: (i) entrepreneurial research university; (ii) productivity of Technology Transfer Offices, (iii) new firm creation; (iv) environmental context including network of innovation. Conflicting opinions over the role of the university's system have been consistently identified across these four streams, which is a major obstacle to understanding university entrepreneurship, thus, the need for further examination (Rothaermel et al. 2007).

This study takes in account the third stream i.e. new firm creation (iii) with a specific focus on the effect of academic governance. This stream features studies focusing on universities' spin-off activities, launch of incubators and different internal/external factors influencing new university ventures, as well as, performance measurements. Accordingly, the literature provides relevant knowledge about the best practices of managing start-ups and incubators, the role of networking activities, the impact of innovation management policies and the overall assessment of the involvement of the University system.

From a managerial perspective, different factors have been identified, either as a contributor or a hinder the success of new ventures led by universities (Lockett et al. 2005, Mustar et al. 2006), for example, university's expenditure in intellectual property and related equity investments appear to contribute to the success of

university spin-offs (Di Gregorio and Shane 2003, Lockett et al. 2003, Lockett and Wright 2005, Patzelt and Shepherd 2009), while the lack of competence (of the founding members/research and managerial teams), the adoption of unrealistic expectations, resource scarcity and cultural issues are impediments to the formation and growth of university ventures (Samsom and Gurdon 1993, Kinsella and McBrierty 1997, Rappert et al. 1999, Chiesa and Piccaluga 2000, Steffensen et al. 2000, Franklin et al. 2001, Schwartz 2009, Rajamäki 2011).

From a networking perspective, the ties between new university ventures and the business world (i.e. institutions, industry associations, venture capitalists) seem to increase funding rates (Shane and Stuart 2002, Grandi and Grimaldi 2003, Johansson et al. 2005, Löfsten and Lindelöf 2005, Hytti and Maki 2007, Salvador 2011), a feature that can be used by the research teams of quality, applying human resources and their individual attitudes in decreasing the probability of failure (Link and Scott 2005, Lockett and Wright 2005, O'Shea et al. 2005, Powers and McDougall 2005, Jain et al. 2009). Consequently, the literature provides wide range of findings vis-à-vis the relationships between new ventures' performances (growth, rate of survival/failure, venture capital funding, Initial Public Offerings) and factors such as universities' policies, faculty members, Technology Transfer Offices, funding teams, investors, networks and other environmental factors.

It is evident that the level of university involvement may be classified as an important, however, a quite controversial driver to the start-ups' performance. Whilst most studies find that a high degree of involvement is beneficial for newly created firms (Di Gregorio and Shane 2003, Degroof and Roberts 2004, Clarysse et al. 2005, Leitch and Harrison 2005, Renault 2006, Anderson et al. 2007, Colombo et al. 2010, Zomer et al. 2010, Mian 2011), other studies provide somewhat negative evidence expressed through resource dependency, non-beneficial reputation effects, lower performance than expected and delayed graduation from the incubation phase (Cyert and Goodman 1997, Johansson et al. 2005, Rothaermel and Thursby 2005, Litan et al. 2007, Schwartz 2009, Swamidass and Vulasa 2009).

The debate is still open and these issues and needs to be studied in depth. A possible research path could be a probe of how universities should redesign their mandates to

effectively manage new firm creation and linkages with external innovation networks (Rothaermel et al. 2007, Grimaldi et al. 2011). Besides, only a few scholars have addressed so far the performance of academic ventures after the graduation from scientific parks or incubators (Rothaermel et al. 2007, Siegel et al. 2007).

Therefore, the aim of this study is to address if the governance of University Faculty Members (UFM), that is, the academic governance on the firms' boards and their academic status (i.e. full, associate professors, assistant professors and lecturers, technicians, etc.) might influence the financial performance (i.e. financial health and profitability) of post-incubated firms. As a control for we use variables such as the number of registered patents, the age and the industry of the firm to strengthen the findings.

3. Research question development

Theoretically, the entrepreneurial attitude of the Faculty members involved should lead to effective technology transfer, closer links to research grants, better availability of advanced technology and, overall, continuous and overarching knowledge flow (Renault 2006, Colombo et al. 2010, Fini et al. 2010, Hayter 2011) However, university driven firms may achieve negative financial outcomes because of the lack of managerial skills and entrepreneurial experience of the involved Faculty or because of the short available time and dedication, given their common academic commitments. Moreover, the conflicts between the University and business organisational cultures could depress the performance of academic start-ups (Cyert and Goodman 1997, Litan et al. 2007, Hülsbeck and Lehmann 2012). The new innovative firms usually involve more academics (on their boards / governance structure) when their survival depend on specific knowhow, however, the stock of knowledge within the University itself is not a determining factor for their involvement in the firm's governance.

Therefore, in order to contribute to such an interesting scholarly debate, the aim of this study is to analyse the effect of academic governance on the financial outcomes of post incubated firms. Hence, the research question analysis the assumption that

academic governance might have an ambiguous effect on the financial performance of the firm, and, the academic status of the Faculty member eventually involved in the firm governance, is not tied to the financial performance of the firm, per se.

Our evidence is based on a sample of Italian firms from three different University Incubators. Additionally, we accounted for the effect of different variables by applying a multivariate linear regression model. All the methodology details are presented in the following section.

4. Research methodology

This is an empirical study taking a sample of 71 post-incubated New Technology Based Firms, which have left, or have "graduated" from three important Italian University Incubators, namely: (i) the Turin Polytechnic's Incubator (called "I3P" which stands for "Incubatore Imprese Innovative Politecnico"), (ii) the Milan Polytechnic's Incubator (called "Acceleratore d'Impresa") and (iii) the incubator linked to the University of Bologna (called "AlmaCube"). Although, in the last decade, the Italian incubation activity increased dramatically, we focus on these three incubators, because they are located in Northern Italy, which is the most industrialized area of the Country, and because of the experience achieved in their activity for several years, as well as, their worldwide standing .[1]

Incubated firms are usually featured by two main characterises, that is, maturity and "graduation year", while belonging to different industries. Therefore, when structuring our sample we decided to consider all the firms that had left the incubators as of 30th June 2009. This allowed us to have sufficient financial data after their incubation phase.

The incubator with the highest number of graduated firms is the I3P (no. 62 firms) and, although these firms are related to different industries, the majority of them (54%) belongs to the ICT sector. Consequently, because of the difficulties in finding

[1] I3P has been awarded by Oxford University as the World Best Science-based incubator in 2004. Moreover, all the three Incubators are active members of PniCube, a leading Italian Incubator association, and of the Gate2Growth network, which is a tool of the EU policies for developing innovative entrepreneurship across Europe.

and collecting appropriate data, we decided to consider, within the other two incubators (Milan and Bologna), only those firms related to the ICT industry. Certainly, in our study we controlled for the differences in the industry. Overall, the maximum annual turnover of the sampled firms is not more than 4.5 million euro and the average number of employees account in the range of 2-10 people.

Since only Italian limited companies have to provide public financial statements, we had to exclude partnership firms. Financial data were collected by requesting financial statements (years 2008, 2009, 2010 and 2011) from the Chambers of Commerce, and we were able to collect financial statements related to 71 firms (as stated before).

The complete breakdown, by industry, of the available financial data related to the sample of post-incubated firms is reported in the following table.

Table 1: Nr. of sampled firms, breakdown by industry and available financial statements.

Industry	Available financial statements				**Total Sample**	
	2008	2009	2010	2011		
Aerospace	1	1	1	1	**1**	**1%**
Biotech	1	1	1	1	**1**	**1%**
Building & Architecture	1	1	1	1	**1**	**1%**
Chemicals & Material	1	1	1	1	**1**	**1%**
Electronics & Automation	11	11	11	10	**11**	**15%**
Energy	4	4	3	4	**4**	**6%**
Environment & Territory	4	4	4	4	**4**	**6%**
Information Technology	45	45	45	45	**45**	**63%**
Mechanics	3	3	3	3	**3**	**4%**
Total	**71**	**71**	**70**	**70**	**71**	**100%**

As the majority of the firms were incubated by I3P, in order to better understand their governance and the role played by the involved University Faculty staff, we had an in-depth interview with the I3P's CEO to double check our findings.

The following sub-sections present the specific methodologies according to the different study's variables.

Financial Performance analysis

We analysed the financial performance of the firms by focusing on financial ratios computed on the basis of the financial structure, leverage and profitability. Generally when firms are not listed on a stock market, the financial and profitability ratios can

be used as main tools of analysis to assess financial performance (Chakravarthy 1986, Finer and Holberton 2002). Nonetheless, these measures may be biased because of the sample composition, firms operating in different industries featured by specific industry-driven levels of fixed assets, variable/fixed cost ratios and overall competitiveness (Porter 1980). To overcome these limitations we carried out a comparison with specific industry ratios averages (George et al. 2002), which ensued not to be that important, because of the peculiarities of New Technology Based Firms, such as their young age, rapid levels of growth, technology development, high levels of start-up funds' absorption and different availability of subsidies (Schneider and Veugelers 2010).

Thus, in order to overcome the previous limitations and adopt a unique dependent variable accounting for an overall firm's financial performance, we applied the Altman's Z score (Altman 1968, Zhang et al. 2010). Z scores are financial rations essentially used to predict bankruptcy, but they can be used as a valuable index of firms' overall performance.

In this regard, as our sampled firms are not publicly traded on stock markets, we utilize the Z score formula developed for privately held firms, which is:

$$Z = 0.717(X1) + 0.847(X2) + 3.107(X3) + 0.420(X4) + 0.998(X5)$$

where:

X1 = working capital/total assets

X2 = retained earnings/total assets

X3 = earnings before interest and taxes/total assets

X4 = equity book value/total assets

X5 = sales/total assets

Usually New Technology businesses became profitable and financially sustainable after some years from their start-up (Rothaermel and Thursby 2005), therefore, in our analysis, we control for the age of the firm at each financial year of data.

Academic governance analysis

For the purpose of this analysis the 'Academic governance' is defined as the presence of Universities' Faculty Members (UFM) (i.e. full, associate and assistant professors, lecturers and administrative staff) on the board of directors ending 30th September 2012. Hence, we excluded all other types of academic link and/or collaboration (i.e. tutors, instructors, scholarship holders, Ph.D. candidates, etc.) who might have been involved within the firm activity.

In order to find out if a post-incubated firm of our sample does involve an academic in its governance, we checked the directors' lists, which is usually attached to the financial statements, and we cross-checked with the personnel's lists available on the websites of founding academic institutions. This information was available for all the firms. We had double-checked the I3P's data (54 firms out of 71) during the interview with its CEO.

In our analysis, a dummy variable (*AG*) is used to address the presence of academic governance in each firm. Another categorical variable (*AStatus*) is used to rank for the academic status of the University Faculty member involved, specifically, if applicable, a value of 3 is assigned when a full or associate professor presence occurs, a value of 2 is assigned is an assistant professor o a lecturer, and a value of 1 if the board member is a University technician or other administrative staff.

In order to address the influence of academic governance on the financial performance of the graduated firms, we conducted multivariate statistical analysis by developing a linear multiple regression model. As such, in order to not break one of the assumptions of linear regression, namely the linear independency of predictors, we included in the model the multiplication of the two principal independent variable, namely *AG* and *AStatus*. Furthermore, we decided to include three control variables related to the number of patents registered by the firm, its age and its industry.
The resulting linear regression model is summarised by the following formula.

$$Fperf_i = \beta_0 + \beta_1 AG_i + \beta_2 AStatus_i + \beta_3 Patents_i + \beta_4 Age_i + \beta_5 Ind_i + \varepsilon_i$$

where:

- i number of each different observation;

Fperf dependent variable, the financial performance of one sampled firm related to a particular period, it is equal to the Z score computed on financial statements available data for that period;

AG dummy variable accounting for the presence of a University faculty member in the governance of the firm;

AStatus categorical variable accounting for academic status of the Faculty member (i.e. full/associate professor, assistant/lecturer, technician/administrative);

Patents control variable accounting for the numbers of patents which have been registered in a specific financial year by the firm;

Age control variable accounting for the age of the firm in a particular financial year, it's computed as the difference between the year of financial data and the year of establishment of the firm;

Ind dummy variable controlling for the influence of industries other than the ICT one, it assumes a value of 1 when the firm doesn't belong to the ICT industry and 0 if it belongs to other industries.

In the following section we present and discuss the findings of the study.

5. Findings and discussion

Our operational sample is composed by 71 New Technology Based Firms graduated from three Universities' Incubator in Italy, specifically, 49 were incubated by I3P Turin (69% of the sample), 10 by Accelaratore d'Impresa in Milan (14%) and 12 by AlmaCube Bologna (17%).

By analysing the involvement of Universities' Faculty Members (UFM) on the firms' boards, we found that 22 firms (31% of the sample) have what we define as 'Academic governance' because their board of directors involve at least one Faculty member from a University. The majority of such Faculty, specifically 14 people, have the status of full or associate professor, there are 8 assistant professors involved in the firms and only a minority of administrative and technical staff. The complete breakdown of the findings is presented in Table 2.

Table 2 – Number of firms with Academic Governance and related Status of the Faculty involved.

Academic Status	Academic Governance (*AG*)		**TOTAL**	%
	Yes	No		
Associate/Full professor	14		**14**	19.7%
Assistant professor /Lecturer	6		**6**	8.4%
Administrative/Technician	2		**2**	2.8%
Not applicable	-	49	**49**	69.0%
Total (%)	**22 (31.0%)**	**49 (69.0%)**	**71**	**100%**

Financial data, was available for the majority of the sample and it covered all the 22 firms with academic governance. In order, to provide some quick highlights about the financial performance of the firms, we computed some financial ratios, namely Return On Assets (ROA), Return On Equity (ROE) and Debt/Equity ratio (D/E).

Table 4 presents the summary of the computed financial ratios according to the Academic governance feature.

Table 3 – Means of financial ratios computed on available financial data

	Financial Year	Academic Governance (*AG*)		TOTAL	
		Yes	No	Mean	Std. Deviation
ROA (%)	2008	-1.1%	9.50%	6.3%	22.5
	2009	1.2%	7.10%	6.8%	21.2
	2010	1.9%	11.30%	8.6%	26.3
	2011	1.4%	8.70%	13.2%	27.7
ROE (%)	2008	1.2%	3.40%	2.5%	56.3
	2009	-11.8%	-1.20%	-3.6%	51.2
	2010	6.2%	9.00%	8.6%	52.3
	2011	1.3%	6.40%	4.7%	47.6
D/E	2008	12.7	4.7	8.7	37.3
	2009	4.8	3.5	3.9	5.2
	2010	3.6	3.8	3.8	3.7
	2011	2.9	3.9	3.6	5.2

If we focus on the financial ratios' summary, it seems that firms featured by Academic governance are under performing if compared to the other firms in our sample. However, the 2009 year shows the impact of the Global Financial Crisis in the profitability and the financial structures of the whole sample. The only significant difference between the two groups (firms featured by academic governance vs. other firms) are related to 2010 and 2011 ROA and ROE ratios. Besides, when analysing the firms with Faculty member in their governance, it seems that those involving full

and associate professors are under performing in the early years, but then turn around in the following years of activity (2011 and 2012).

In order to have a more comprehensive financial performance variable, the Altman's Z score was computed. The higher Z score, the better is the performance of the firm. The results confirm our previous findings, the means' values between academic and non-academic governed firms seem to be quite different, however significant differences are only found between data from 2008, 2010 and 2011. When looking closely into academic governed firms, although underperforming in the first year of analysis, no actual significant differences were found in the Z score means. Table 6 and 7 present these findings accordingly.

Table 4 – Z scores means values according to the presence of academic governance.

Z Score (*Fperf*)	**Academic governance (*AG*)**		t	Sig.	TOTAL			
	Yes	No			Mean	Std. Deviation	Min	Max
2008	1.663	2.249	2.089	0.041 *	2.017	1.152	-1.232	5.213
2009	1.327	1.928	2.475	0.016 *	1.586	1.146	-1.116	5.385
2010	1.985	2.456	1.575	0.132	2.258	1.715	-2.504	7.932
2011	1.352	2.264	2.338	0.023 **	2.012	1.565	-1.496	6.378

* p ≤ 0.05, ** p ≤ 0.01

Table 5 – Z scores means values according to Faculty member status.

Z Score (*Fperf*)	**Faculty Status (*AStatus*)**		t	Sig.	TOTAL			
	Full/Associate Professor	Assistant professor/ Lecturer/ Technician			Mean	Std. Deviation	Min	Max
2008	1.62	1.646	-0.951	0.354	1.663	1.331	-0.621	4.261
2009	1.215	1.446	-0.570	0.575	1.327	1.534	-0.742	3.421
2010	2.136	1.932	-1.501	0.150	1.985	1.576	-1.651	5.090
2011	1.719	0.547	-0.859	0.402	1.352	1.641	-1.407	3.430

* p ≤ 0.05, ** p ≤ 0.01

Notes: means computed on no. 22 firms featured by academic governance.

Moreover, we controlled for the number of patents that each firm has registered in the year of analysis. Data could be found at the Italian Registry of Patents, which has an online database allow to do search queries by name of the owner (www.uibm.gov.it). Our findings are consistent with previous literature argumentations, that is, firms

involving Universities' Faculty Members (UFM) register more patents (D'Este and Perkmann 2011, Fini et al. 2010, Grimaldi et al. 2011). Data provided in Table 8 shows that firms governed by Faculty members, on average, have registered more patents than other firms, especially at the early stage of their graduation.

Table 6 – Average numbers of registered patents, breakdown by year and academic governance.

		Academic Governance (*AG*)		TOTAL	
	Financial Year	Yes	No	Mean	Std. Deviation
Average Nr. of registered Patents	2008	1.1	0.4	0.61	1.51
	2009	2.9	1	1.65	1.82
	2010	3.3	1.8	2.28	2.13
	2011	4.6	2.6	3.43	2.42

Finally, before conducting the multivariate statistical analysis, we carried out a correlation analysis in order to highlight single variables relationships. The overall descriptive statistics and the resulting correlation matrix are summarised in the following tables.

Table 7 – Main variables study, descriptive statistics.

Main variables - Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
1. Academic governance (*AGov*)	282	0	1	0.32	0.23
2. Academic ranking (*AStatus*)	88	0	3	2.39	0.46
3. Patents (*Patents*)	284	0	6	3.59	1.98
4. Age (*Age*)	284	2	6	4.34	0.64
5. Industry (*Ind*)	284	0	1	0.73	0.31
6. ROA	282	-64.55%	188.32%	7.91%	26.15%
7. ROE	282	-271.20%	121.20%	0.06%	45.12%
8. D/E	282	-25.0	297.0	4.9	18.81
9. Z score (*Fperf*)	282	-2.504	7.932	2.031	1.034

Table 8 – Correlation matrix (Pearson's correlation coefficients).

VARIABLES	1	2	3	4	5	6	7	8	9
1. Academic governance (*AG*)	1	.534**	.936**	.035	.404**	-.096	-.055	.098	-.250**
2. Academic ranking (*AStatus*)	.534**	1	567*	-.105	.299**	.113	-.029	.051	.221*
3. Patents *(Patents)*	.936**	.567*	1	.645*	.043	.434*	.232	.545*	.767

4. Age (*Age*)	.035	-.105	.645*	1	-.243**	.044	.096	.121	.213**
5. Industry (*Ind*)	.404**	.299**	.043	-.243**	1	-.092	-.104	.080	-.269**
6. ROA	-.096	.113	.434*	.044	-.092	1	.397**	-.021	.637**
7. ROE	-.055	-.029	.232	.096	-.104	.397**	1	-.038	.500**
8. D/E	.098	.051	.545	.121	.080	-.021	-.038	1	-.060
9. Z score (*Fperf*)	-.250**	.221*	.767	.213**	-.269**	.637**	.500**	-.060	1

* p ≤ 0.05, ** p ≤ 0.01

As can be seen from the previous table, the correlation between the financial performance variable (*Fperf*) and the other financial ratios (ROA, ROE, D/E) confirm the usability and the reliability as an overall financial score. The financial performance variable (*Fperf*, computed as the Altman's Z score*)* is negatively correlated with the presence of academic governance in the firms (*AG*), positively correlated with the academic status (*AStatus*), positively correlated with the age of the firms (*Age*) and negatively correlated with the industry variable (*Ind*, which address if the firm belongs to industries different from ICT).

The number of registered patents, which is higher when the firms have academic governance on board, is confirmed to be an important driver of profitability, having a significant correlation with ROA. Nevertheless, firms governed by academics seem to be underperforming when considering the Zscore (*Fperf*) variables, which can be explained by taking into account the financial structure (D/E ratio). Actually, the relevant investments in knowledge and resources that lead to a patent registration can negatively affect the financial structure by increasing the amount of debt if compared to equity, explained by the correlation between *Patents* and *D/E*. The Z score is mainly a financial predictor of bankruptcy, thus shows negative increase in debt, and related assets, over equity (component *X4*, equity/total assets).

Furthermore, to increase the validity of our study, we test a multiple linear regression model in order to address the combined effects of different independent variables on the firms' financial performance. In other words, we analysed the overall influence of academic governance, the academic status of the faculty members involved on the Z score values by controlling for the number of registered patents, the age and the industry of the firms.

The result of the regression analysis is presented in Table 9, which clarifies that academic governance is more likely to have a negative impact on financial performance. Moreover, the number of registered patents is expected to have a positive effect on the overall performance, as well as, the age of the firm. In this regard, it can be said that firms not belonging to ICT industry (i.e. biotech, energy, healthcare, etc.) might have more volatile profitability due to the higher uncertainty of their outcomes. Because the presence of academic governance (*AG*) and the academic status of the Faculty members (*AStatus*) resulted to be significantly correlated, we tested for their combined effect *(AG*AStatus).*

Table 9 – Multiple linear regression results (dependent variable= Financial Performance).

VARIABLES	Predicted sign	β	Std. Error.
Intercept		1.960	0.237
AG	-	-0.351**	0.129
AStatus	-	-0.234	0.212
*AG*AStatus*	-	-0.413**	0.121
Patents	+	0.323	0.241
Age	+	0.107	0.039
Ind	+/-	-0.559	0.211
R^2	0.242		
Adjusted R^2	0.233		
* p ≤ 0.05, ** p ≤ 0.01			

As can be seen by the R^2 value, the overall variance on financial performance explained by the three chosen independent variables is 24.2%. The effect on financial performance of the presence of academic governance is significantly negative (β=-0.351, significant at p=0.01). This may sound odd, but firms that receive knowledge flows from Universities are related to high risk industries which requires increase in resources and need more time to reach positive cash flows. Usually, these resources are employed to develop new technologies and advanced knowledge, related to patents' registration. Such investments are only a part of the intangible assets and are often recognized as 'research expenses' owing to national accounting principles and, therefore, leading to low financial statements results.

The academic status (*AStatus*) of the Faculty member eventually involved in the governance, doesn't have itself a significant effect on financial performance.

However, if we combine its value with the academic governance variable (*AG*AStatus*), we can see that the overall effect on financial performance is significantly negative (β=-0.412, significant at p=0.01). Control variables strengthen the regression model, however they do not seem to have a significant effect on the results for the financial performance of the firms.

Therefore, our research question is in line with the results. Academic governance has a negative or somewhat ambiguous effect on the financial performance of the firms, and the academic status of the Faculty member eventually involved in the firm governance, is not tied to the financial performance of the firm, per se. Such effects can be reasoned in the following manner. On the one hand, an important role is played by the nature of the business of analysed firms. Usually, firms involving academic entrepreneurs belong to advanced technologies and risky industries because of the specific knowledge of the involved Faculty and the availability of Universities' resources. Therefore, the performance of such firms is subject to a high rate of uncertainty and becomes eventually more effective over a longer time frame after the start-up phase. On the other hand, the academic status of faculty members, particularly in the Italian context, could add some additional argumentations to our findings. Indeed, it is quite common that University professors may continue their academic commitments while, in the meantime, acting as shareholders, directors, consultants or advisors of firms. Previous studies pointed out that scientists prefer to maintain university ties to share ongoing research results and gain access to the scientific knowledge pool, while receiving the benefits of dividends payout (George et al. 2002). University scholars are interested in preserving their academic role identity even as they participate in technology transfer (Jain et al. 2009), which explains the risk aversive positioning of academics as opposed to the high uncertainty of the typical business of incubated firms (Renault 2006). Furthermore, the lack of experience in general management (Wright et al. 2008) and lack of managerial skills (Vohora et al. 2004) have always been addressed as drivers of low financial performance. Specifically, this issue becomes more relevant if academics that work on technical subjects, as the case of our sample of firms, where the majority of Faculty members have an engineering background.

Further, academics are not involved in day-to-day management of an incubated firm. Faculty with marginal roles in Universities, like assistant professors or lecturers usually earn lower salaries than full or associate professors, and might be more concerned to achieve positive returns from firms they are eventually involved in, even in the start-up stage. Full or associate professors, although might not be very involved in the management of the firm, during its start-up stage might facilitate industry networking, access to funding and grants. Therefore, innovations, patents, processes and products developed in riskier businesses might lead to increasing returns for their investors. This might explain the dramatic improvement in 2011's financial performance by the firms with academic governance.

In the next section we conclude the study by highlighting the implications of such findings and by addressing the possible limitations.

6. Conclusions

The study contributes to the considerable debate on the outcomes of effective university–business linkages. Importantly, we focused our analysis on the financial performance of New Technology Based Firms that have grown in Universities' incubators, specifically, when some Faculty members where directly involved on the firms' board of directors.

Previous scholars (George et al. 2002) have uneasy explanations related to university-business links and business performance. Issues are usually tied to the rapport of different drivers to financial performance. Indeed, revenue level has been accepted as financial performance metric for mature firms but it might be not suitable for innovative start-up firms (Rothaermel and Thursby 2005, Rothaermel et al. 2007). As such, we applied a wider measure of financial performance, namely the Altman's Z score which, although it has been developed to assess the survival skills of a firm, it can be used to reflect an overall performance (Farjoun 2002). Certainly, the study provided some interesting results, able to validate our research question. Specifically, our evidence shows that the presence of academic governance somewhat ambiguous effect on the financial performance of the firms.

The relevance of our results could be explained by the crucial value of innovation and the role played by start-up firms in today's business. Potential benefits of academic governance could improve firms' performance only if the involved Faculty acts both as 'knowledge provider' and 'strategic supporter', by becoming really committed in the management and in the business activities. Indeed, our results are to be appropriated by academic institutions that aim at creating and disseminating knowledge through a direct involvement in different business ventures.

7. Limitations and further research

The study is not free from limitations, first of all, the availability of financial data for analysed companies in the midst of Eurozone debt crisis, as Italy and its firms still suffering a period of economic slowdown.

Furthermore, the negative relationship between academic governance and financial performance could have been influenced by the academic discipline of the Faculty members involved. In other words, the majority of the Faculty involved in our sample, is featured by an engineering background and this could justify the divergences in management and governance.

The sample used in this study is composed only by Italian firms and related Incubators are linked to Universities with a major focus on engineering and ICT, only a minority of firms were involved in other growing and strategic industries like biotech, pharmaceutical, energy, etc. Indeed, further research might specify and decompose/aggregate these findings.

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