

The Impact of Insider Ownership on Success Performance of University Spin-Offs. The Pivotal Role of Managerial Ownership

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Abstract

The paper aims to explore the effect of insider ownership' dynamics in University Spin-Offs (USOs), in order to compute the impact generated by such corporate governance mechanism to the success performance of the firm. In detail, it was hypothesized that managerial ownership influences, both in negative and positive, the firm performance, measured in term of profitably by the ROS index. Based on a panel sample of 692 Italian USOs, the results suggest that USOs with a large presence of shareholder managers can achieve better performance, highlighting the pivotal effect of insiders due to the better control and involvement in the entrepreneurial process. The paper offers some contributions to the corporate governance and university entrepreneurship literature, highlighting the pivotal effects of control by the managerial class on the performance degree of the USOs.

Keywords: *University Spin-Offs; corporate governance; managerial ownership; insider ownership; firm performance.*

1. Introduction

In recent years, the focus of scholars and practitioners on growth and promoting factors of entrepreneurship through University spin-offs (USOs) - i.e. new technology-based firms created with the support of the university and its members -is significantly increased (Berbegal-Mirabent et al., 2015; Sternberg, 2014; Pazos et al., 2012). These university start-ups, in fact, constitute an active tool in stimulating the creation and development of knowledge-based economies (Iacobucciand Micozzi, 2015; Lazzeriand Piccaluga, 2012; Sternberg, 2014). Therefore, the determinants related to their genesis and growth have become key issues in the policy actions related to the dissemination and management of innovation in specific environmental contexts (Lockett et al 2005).Nevertheless, the previous studies on the topic have been mainly focused on the macro, meso and micro dynamics fostering USOs (Djokovic and Souitaris, 2008; Muscio, 2008), but not exhaustively explored the dynamics concerning their governance.

However, the relevance of corporate governance mechanisms is widely recognized by several studies involving companies with similar characteristics to USOs, such as new technology-based firms and high-tech SMEs (Aaboen et al., 2006; Clarysse et al., 2007; Colombo et al., 2014).The study of the corporate governance dynamics is particularly significant in USOs since, given their knowledge and technology-driven nature, investments are often characterized by rapid growth and actual investment opportunities: these elements lead to an increasing of information asymmetry between management and property (Gaver and Gaver, 1995); jointly, they may generate agency problems, since the goals and risk attitude of the principal (owner) are not always aligned with those of the agent (management), especially in complex high-tech environment (Jungwirth, and Moog, 2004). The corporate governance mechanisms can be broadly summarized as internal (Wintoki et al., 2012) and external (Filatotchev and Nakajima, 2010).

This study intends to focus the analysis of insiders' dynamics in USOs, with particularly regard to management ownership, in order to compute the impact generated by such governance mechanism to success performance of the firm. With this purpose, it was analysed a panel sample of 692 Italian USOs extracted from the Netval database at 2014. The Italian context recently has been characterized by a rapid development of academic entrepreneurship (Fini et al, 2011; Lazzeri and Piccaluga, 2012). The study contributing to the corporate governance and university entrepreneurship literature, highlighting the pivotal effects of control of the managerial class, fundamental formed by academics (Rasmussen et al., 2006), on the performance degree of the firm.

2. Theoretical framework and hypothesis developed

Literature on corporate governance framing the agency costs (Pratt et al., 1985) - arising from the separation of ownership and control, and the resulting difference between the potential value and the realization of the assets of the company - as the main problems concerning the ownership structure and, in general, the corporate governance (Jensen and Meckling, 1976). Using agency theory in the relationship between ownership structure and firm performance, it follows, as USOs should identify ownership structure that enables a business management function to the full development of the business itself.

In the context of the USOs, the entrepreneur-academic is usually simultaneously the owner and manager of the firm (Darby and Zucker, 2005; Angel and Fumas, 2008); element this that gives at the same a significant influence in the management and control compared to non-academic and largest firms (Hogan and Hutson, 2005). Ang et al. (2000) analysing the agency costs within the small businesses context found that they increasing with the widening of the ownership structure at not members of the managerial class. Additionally, the agency costs be inversely proportional to the management ownership. This consequence could also partly due to the fact that owners of small start-ups typically lack suitable skills and capability in financial management and governance, thereby reducing the effectiveness of their monitoring (Van Frederikslust et al., 2007).

The latter consideration is consistent with the peculiarities of university orientation in promoting the creation and development of spin-off, together with those of the entrepreneurial team (Shane, 2004; Iacobucci et al., 2011). From these preliminary considerations, it could be argued the positive and prominent role played by internal ownership structure in the development and growth of USOs. However, the literature is not fully a unique view, both theoretical and empirical, on the topic. On one side, a consolidated literature (Jensen and Meckling, 1976) stresses that in case that the management also are owner of the firm (so-called insider or internal), the same should allocate resources in a more efficient way, aligning managerial interests with those of the owners (Mustapha and Che Ahmad, 2011).

In contrast, a greater dilution of the ownership, also among managers, undermines the ability of the owners to monitor management; effect the latter generating a cost of agency called alignment of incentives argument (Shutoand Takada, 2010). Evidences supporting these assertions, involving positive and linear on the firm's performance was noted also by Ruan et al. (2011), Core and Larcker (2002) and, in the context of SMEs, by Lappalainen and Niskanen (2012). Nevertheless, the relationship between insider ownership and firm performance can be often not linear. In fact, several studies (McConnell and Servae, 1990; Short and Keasey, 1999), also in the knowledge and technology intensive context (CuiandMak, 2002), generally agree that the increase in managerial ownership creates compensatory alignment interest and entrenchment effects, which lead to greater non-linearity in the relation control-performance. Also, some scholars found an effective negative impact of managerial ownership on firm performance (Mandacı and Gumus, 2010; Shah and Hussain, 2012). Thus, the actual form taken by this relation is inconstant across studies.

In view of the of the conflicting theoretical arguments and empirical evidence regarding the impact of management ownership on the firm's performance, also with regard to the context of technology and knowledge driven start-ups, it has been developed the following alternatives research hypothesis:

H₁: Managerial ownership is positive related with the success performance of USOs.

H₂: Managerial ownership is negative related with the success performance of USOs.

3. Method

3.1. Sample

In order to test the research hypothesis above, it was analysed a panel sample of 692 Italian USOs extracted from Netval database at 31 December 2014 (database collecting the population of research spin-off existing in Italy), accounting for 60.49 % of the Italian population identified. Data coverage a period from 2004 to 2013, however financial data vary over time while corporate governance data are time-invariant. The collection of secondary data was performed by the analysis of financial statements and other corporate documents extracted from Infocamere database and Aida BdV database (containing financial, biographical and merchandise data of about 700,000 Italian active companies).

3.2. Variables definitions

- **Dependent variable**

With the aim to measure the success performance of USOs sampled, it was used a financial ratio, the Return on sales (USO performance) and it was measured as a company's net earning divided by its sales (Collis, 1991). ROS captured the effect of managerial ownership on a USO's profitability. Return on sales constitutes one of major indicator of firm performance (Oh et al., 2015), also in the context of SMEs (Mendoza, 2015).

- **Independent variable**

With the aim to predict the potential effects of some insider's dynamics on the success performance of USOs it was used the managerial ownership as independent variable. Managerial ownership was computed with an indirect approach, using the fraction of USO's managers that have ownership participation by dividing the number of shareholder manager on the total of shareholders of the USOs (*Managerial ownership*).

- **Control variables**

We controlled for firm size and age. Firm size was measured by the total assets of USOs (*Size*). Firm size might have a significant effect on the performance patterns of small entrepreneurial firms (Storey et al., 1987). While, firm age (*Age*), measured as number of established years, is usually related to entrepreneurial performance of the company (Lechner and Leyronas, 2007).

3.3. Analytical approach

In order to test the research hypotheses developed a linear mixed-effect model was used, which is a very useful statistical model for the analysis of longitudinal data, and which also offers a high flexibility in modelling the within-subject correlation frequently existing in longitudinal data while handling with both the balanced and as well as the unbalanced data (Pinheiro, 2005; Verbeke and Molenberghs, 2009). In addition, linear mixed-effect models are more powerful than classical techniques (e.g., ANOVA, MANOVA, multiple regression analyses) in exploring the effects related with repeated measures, as they model the covariance matrix instead of imposing a definite form of structure as employed in standard univariate and multivariate methods (Shek and Ma, 2011). In line with these considerations, the following linear mixed-effect model was developed, and it allows for time and firm fixed effects:

$$USO_{performance}_{it} = f(\beta_0 + \beta_1 Managerial_{ownership}_i + \beta_2 Size_{it} + \beta_3 Age_i + \delta_t + \epsilon_{it})$$

Where i indexes universities and t indexes years. In addition, δ_t is the time effect and ϵ_{it} is the error term.

4. Results

4.1. Descriptive statistics

Table 1 shows the descriptive statistics of variables used in the study. The results indicate that sampled firms show an average of profitably performance, measured by ROS index, of 4.07, with an moderate dispersion in the sample (S.D. = 11.58), and highlight how the USOs sampled have a generally an acceptable degree of profitability. Nevertheless, this evidence is uneven within the sample, remarking the heterogeneity characterizing the financial performance of USOs. With regard to the managerial ownership, the results show a sample-wide mean of only 0.11 USO's shareholder managers on total shareholders of the firm. Considering that this data is low dispersed in the sample (S.D. = 0.002), the same is symptomatic of a low managerial involvement in the ownership of the USOs. Table 2 show the correlation matrix among all variables of the study.

As expected there is a positive and significant correlation between USOs performance and managerial ownership (0.085); while the negative and significant correlation between USOs performance and firm size (-0.076) precludes a deleterious impact of the firm dimension to the its performance, in contrast to the previous literature but, jointly, better aligned to the dynamics involving large firms (Storey et al., 1987).

4.2. Linear mixed-model model estimation

Table 3 shows the results of the linear mixed-model estimating the impact of insiders on success performance of university start-ups. H_1 states a positive relationship between managerial ownership and success performance of the USOs, while inversely, H_2 states a negative relationship between managerial ownership and success performance of the USOs. Concerning the estimation of the firm-control effects, the coefficient on firm age is positive but no statistically significant (we considered valid only estimations with a significance level under the 10%); while as expected from the results of descriptive statistics, the coefficient on firm size is negative and statistically significant, also its impact on USOs performance is very low. With reference to the estimation of the principal effect, the coefficient on managerial ownership results positive and statistically significant (coeff. = 3.698, $p < 0.001$), highlighting the pivotal effect of insiders in reaching better firm performance in USOs context due to the better control and involvement in the entrepreneurial process. Thus, the findings provide support to the H_1 , while the H_2 results not supported.

5. Results discussion and conclusion

The paper aimed to study the effects of insider ownership on success performance of USOs. In detail, and based on existing literature, it was stated that managerial ownership potentially influences the firm performance of this type of firm, measured in term of profitably by the ROS index; nevertheless, the direction of this relation can be positive but also negative. In order to test the developed hypotheses, a sample of 692 Italian USOs was investigated during an exploration period of ten years (from 2004 to 2014). The findings show that USOs with a large presence of shareholder managers can achieve better performance, in financial term. This evidence is consistent with the findings of Drakos and Bekiris(2010) and Lappalainen and Niskanen(2012), suggesting that the ownership structure may be a more important determinant of the success performance of university start-ups. USOs with high managerial ownership levels exhibit higher profitability ratio, emphasizing the pivotal role of insiders in this type of firm.

Our results have some important managerial and practical implications. Since USOs are very sensitive to several kinds of market failures, particularly throughout the early stage (Hall and Rosenberg, 2010) their support becoming critical for firm development (Sørheim et al., 2011). In this regard, a major involvement of the key actors of the management of USO is essential to assure a better-aligned goals and growth patterns in the exploitation and commercialization of knowledge and technologies developed in academia. In this context, the literature just emphasizing the promoting and inspiring role of the individual academic (or surrogate) entrepreneur, especially at the early stages of the venture (Lockett et al., 2005; Scholten et al., 2015); however in order to achieve a full development of the firm and perform better, it is crucial a more active involvement of the academic entrepreneur, jointly with the other actors of the USO's management, in the ownership structure of the firm.

Nevertheless, our study is not free from limitations. First, the study is grounded only on the managerial ownership as insider effect on performance of USOs. However, other internal governance mechanisms can potentially affect the relation studied: in this regard future studies can take advantage from the inclusion in the research design of ownership dynamics involving executives, board members and block holders (Chou, 2015; Sheu et al., 2005). In addition, considering the entrepreneurial orientation of the USOs and, thus, the major implication of the growth dynamics of academic entrepreneurship, further research can focus the analyses not only on the financial performance of USOs but also on their growth patterns (Lappalainen and Niskanen, 2012).

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Table 1. Descriptive statistics

| | N | Min. | Max. | Sum | Mean | Std. Dev. | Variance |
|----------------------|------------|------------|---------------|----------------|-------------|------------|--------------------|
| | Statistics | Statistics | Statistics | Statistics | Statistics | Std Error | Statistics |
| USO performance | 3222.000 | -51.380 | 29.970 | 13127.820 | 4.074 | 0.204 | 133.983 |
| Managerial Ownership | 7044.000 | 0.000 | 1.000 | 820.665 | 0.117 | 0.003 | 0.062 |
| Size | 3808.000 | 1005.000 | 170433982.000 | 6533980565.000 | 1715856.241 | 144728.985 | 79764192768282.700 |
| Age | 8304.000 | 2.000 | 78.000 | 71820.000 | 8.649 | 0.071 | 41.825 |
| Validi (listwise) | 2820.000 | | | | | | |

Table 2. Correlation matrix

| | 1 | 2 | 3 | 4 |
|------------------------|----------|---------|---------|----------|
| 1 USO performance | 1 | 0.085** | 0.026 | -0.076** |
| 2 Managerial Ownership | 0.085** | 1 | -0.022 | 0.009 |
| 3 Age | 0.026 | -0.022 | 1 | 0.144** |
| 4 Size | -0.076** | 0.009 | 0.144** | 1 |

** P < 0.01; * p < 0.05 (all two-tailed tests).

Table 3. Estimation of linear mixed-effect model regression with ROS index as dependent variable

| Parameter | Estimation | Std. Error | Degree of freedom (df) | t | Sig. | Confidence interval at 95% | |
|----------------------|---------------|--------------|------------------------|--------|-------|----------------------------|--------------|
| | | | | | | Lower limit | Upper limit |
| Intercept | 14.749591 | 11.412056 | 0.000 | 1.292 | 1.000 | -4037.279637 | 4066.778820 |
| Managerial ownership | 3.697640 | 1.065692 | 472.324 | 3.470 | 0.001 | 1.603557 | 5.791723 |
| Age | 0.023717 | 0.036800 | 368.484 | 0.644 | 0.520 | -0.048648 | 0.096082 |
| Size | -1.698115E-07 | 3.838126E-07 | 46.174 | -0.442 | 0.660 | -9.423077E-07 | 6.026846E-07 |