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Founding team composition and early performance of university–Based spin-off companies



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ABSTRACT

The start-up of business ventures (university spin-offs—USOs) is an important channel that universities can use to transfer the results of public research to the economic system.

Several empirical investigations however show that the majority of public-research spin-offs perform rather poorly (see for example Mustar et al., 2008. *Science and Public Policy* 35(2), 67–80). Therefore, identifying and analysing the obstacles that limit the success of this type of high-tech start-ups appears extremely important to better understand and, where possible, leverage their potential contributions in terms of innovation and growth.

The existing literature on the performance of USOs studies these companies as any other high-tech start up, overlooking the peculiarities related to the presence of academic personnel in the entrepreneurial/management team. The aim of this paper is to fill this gap by analysing the relationship between founding teams and USO performance through a multi-level approach to the team demography. In particular, we try to account for some of the peculiar features which may shape the functioning of USO founding teams and arise mostly from the need to properly balance the scientific and commercial orientation with one another. The empirical analysis, carried out on a sample of 103 Italian USOs, shows that founding teams with a composition that promotes simultaneously differentiation and integration of academic and non-academic profiles, exhibit superior levels of performance in terms of growth.

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1. Introduction

During the past two decades, growing emphasis was placed on the so-called “third mission” of universities, namely the direct contribution to the development of the wider social and economic community, alongside the traditional teaching and research roles.

Although the way to accomplish this task is still subject to debate, both at academic and policy level (e.g. Laredo, 2007; Uyerra, 2008; Goldstein, 2010; Leydesdorff and Meyer, 2010), the university–industry technology transfer emerges as one of the prominent goals within the third mission framework (Etzkowitz and Leydesdorff, 1997; Goldstein, 2010). The pursuit of this goal involves a series of processes and tools aimed at transferring the products of research to the companies and to the market. Among the various technology transfer strategies available, recent years have seen increasing attention paid to the creation of new ventures, university spin-off companies (USOs), as a means of value generation from scientific research.

Following the affirmation in the public policy debate of the idea of “entrepreneurial university” (e.g. Clark, 1998; Etzkowitz, 2003) and

the success of US-based Universities in fostering the establishment of a number of fast growing high technology enterprises, spin-off companies have been increasingly acknowledged as possible drivers of regional and national competitiveness in the global landscape, for their potential role in boosting economic activity (Di Gregorio and Shane, 2003; Nicolaou and Birley, 2003), in creating employment in science-based sectors (Conceicao et al., 2011; Breznitz and Anderson, 2006; Clarysse et al., 2005; Di Gregorio and Shane, 2003; O’Shea et al., 2008; Shane, 2004; Slater and Mohr, 2006), and in providing a link between industry and science (Debacker and Veugelers, 2005; Perez and Sanchez, 2003).

However, empirical observations show that the majority of public-research spin-offs, especially in Europe, are and remain very small-sized enterprises (e.g. Mustar et al., 2008). U.S. evidence also suggests that on average academic new ventures do not perform as well as their non-academic counterparts (e.g. Ensley and Hmieleski, 2005); therefore it is important to identify the obstacles that limit the performance of this type of high-tech start-up.

Most of the existing contributions on USOs tend to concentrate either on the characteristics of the university systems (Goldfarb and Henrekson, 2003; Mustar et al., 2008) and the quality of spin-off policies (e.g. attitude towards surrogate entrepreneurs, developmental model, equity investments, effectiveness of technology transfer offices, (e.g., Ambos et al., 2008; Philpott et al., 2011; Siegel et al.,

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2003), on the availability of support from industry and venture capitalists at the regional level (e.g., Clarysse et al., 2011; Fini et al., 2011; Van Geenhuizen and Soetanto, 2009), on the functioning of technology parks (Hansson et al., 2005; Link and Scott, 2007) or on motivations, personality and intents of the individual founders (Prodan and Drnovsek, 2010; Roberts, 1989). However, although entrepreneurial roles and capabilities are widely recognized as key drivers of start-up performance in technology-based sectors (e.g. Colombo and Grilli, 2010; Newbert et al., 2007; Newbert et al., 2008), relatively few studies on USOs focus on the performance of new ventures by considering the features of entrepreneurial founding teams, and the type of social, scientific and business networks involved (Mustar et al., 2006). These contributions, mainly case-based (Colombo et al., 2010), appear also to overlook the peculiarities of the founding teams of USOs which arise mostly from the confluence of business and academic roles.

For example, when comparing the performance of founding USO teams of with non-university start ups, Ensley and Hmieleski (2005) emphasize the greater homogeneity of USO teams in relation to members' scientific/technical background. However, this consideration may, in principle, be applied to spin-offs from any type of institution or even large business.

Likewise, Clarysse and Moray's (2004) case study of a spin-off from the largest French-speaking university in Belgium, does not directly address the academic dimension and the type of team process formation illustrated in the paper could indeed take place in any type of high-tech start up made up of only scientists.

Wennberg et al. (2011) introduce arguments which are specific to the university environment, and highlight the need to integrate the founding team with people with prior commercial experiences, but the analysis does not include the type of USO that, according to previous studies, is probably the most significant, namely the USO led by academics who are only part-time entrepreneurs (e.g. Stankiewicz, 1994; Grandi and Grimaldi, 2003; Müller, 2010).

Thus, this paper aims at filling a research gap by analysing the relationship between founding teams and USO performance, by focusing on the impact of entrepreneurial team demographic heterogeneity and by taking into consideration the specific features of these academic start-ups.

We assume that university spin-offs, due to their peculiar nature, need to properly balance scientific orientation with business orientation. Scientific orientation is necessary for the process of discovery and early technology development, whereas business orientation is required for the effective commercialization of the products and services which incorporate the technology (e.g. Kasscieh et al., 2002).

If we apply this argument to the structure and composition of USO entrepreneurial teams we are able to capture some of the very peculiar features of these ventures. To achieve this goal, we adopt the demographic approach proposed by the upper echelons literature (Hambrick and Mason, 1984; Hambrick, 2007). According to the upper echelons argument, company behaviour and performance depend on the cognitive attributes of the top managers; in turn these attributes may be proxied through managers' demographic characteristics such as age, education, experience, functional background.

We apply this framework to the entrepreneurial teams of USOs, by adopting a two-level analytical strategy. At one of two levels, team demographic composition is relevant since it can provide the USO with the appropriate scientific and business-related skills, thanks to the joint presence of members with an academic and non-academic profile.

However, the existence of two sub-groups with different professional profiles and cognitive orientations, namely academic and non-academic, may lead to a separation effect within the team: group faultlines may arise and subgroups may become

polarized around certain points of view leading to negative team outcomes. To assess to what extent separation effects are likely to occur or not, we need to consider team demography at a second level, i.e. focusing on those demographic traits that may facilitate group integration. In particular, it has been shown that homogeneity in certain demographic characteristics favours integration. Thus, entrepreneurial team effectiveness in university spin-offs depends on the combination of demographic features that realize differentiation of skill profiles and demographic features that promote integration. Both of these factors depend on dimensions which are specific to university spin-off companies.

Therefore, the goal of this paper is therefore to assess how entrepreneurial team demographic variables may create an appropriate balance between the scientific and business orientations, generating a positive impact on USO performance.

The article proceeds along the following lines. In the first section we describe the context of analysis, namely the university based spin-offs, by briefly reviewing the literature on the demographic characteristics and performance of entrepreneurial teams; in the second section, we outline the hypotheses; the third section describes the sample and the empirical method; in the fourth section we present the results; in the fifth section results are discussed and compared with the previous literature and, finally, in the last section we highlight the current limitations of the study and suggest future developments.

2. Entrepreneurial teams composition and new venture performance

Following theoretical arguments drawn from the resource-based view and the upper-echelon perspective, it has been suggested that one of the main factors that may affect growth and success of new business ventures is the quality of the entrepreneurial-managerial group (Heirman and Clarysse, 2004; Mustar et al., 2006; Hambrick and Mason, 1984; Eisenhardt and Schoonhoven, 1990; Shane and Stuart, 2002). According to these approaches, in small companies executives are more likely to be influential and their decisions to have a more direct effect on the company behaviour, because information and communication processes are not mediated or distorted by extensive bureaucratic structures and articulated hierarchical levels (Finkelstein and Hambrick, 1996); moreover, organizational characteristics of new ventures may facilitate coordination through direct supervision, power and authority and enable more narrowly focused strategic planning and more flexible and effective environmental scanning (Daily et al., 2002).

Technology-based ventures, in particular university spin-offs, are more frequently founded and managed by entrepreneurial teams rather than single entrepreneurs. The success of start-ups in high tech industries depends on the full exploitation of technology as a core resource for the competitive advantage (Hamel and Prahalad, 1994); this requires the capacity to effectively integrate technology features and business strategy (e.g. Frohman and Bitondo, 1981). Compared to single founders, entrepreneurial teams are more likely to possess the capabilities needed to achieve a fit between technology and strategy (e.g. Chowdhury, 2005; Colombo and Grilli, 2010). Moreover, teams seem to handle the high levels of environmental uncertainty characterizing the science-based sectors better than single entrepreneurs (Cooper and Daily, 1997; Gartner et al., 1994; Lechler, 2001; Chowdhury, 2005; Schjoedt and Kraus, 2009).

For this reason, in recent years, a large number of studies on the performance of high-tech start ups has focused on the characteristics of their top management teams (e.g. Ensley et al., 2002, 2003; Ensley and Hmieleski, 2005; Amason et al., 2006; Schjoedt and Kraus, 2009)

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