

# **Innovation and market introduction of technology-based spin-off firms: founding team dynamics in contrasting entrepreneurial ecosystems**

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This paper responds to an increased need for attention to growth of high-tech start-ups and role of entrepreneurial ecosystems. The focus is on a specific type of start-up firm, namely, university spin-offs (USOs). Such firms primarily aim to bring new technology or services developed at university to the market, and to scale-up production. This paper also takes up the often heard challenge to extend analysis of initial USOs growth with stages later in life (e.g. Clarysse et al., 2011); this by using a sample of USOs studied for 12 years and a set of cases studied in more detail for 22 years of USOs' life. The same holds for the challenge to unravel a myriad of relations between founding team dynamics, innovation activity, network creation, and support from contrasting entrepreneurial ecosystems.

The paper investigates the performance of USOs in Northwest Europe under influence of founding teams and initial networks in two contrasting entrepreneurial ecosystems, in a *longitudinal approach*, covering the period of 2000 to 2021. In literature, founding team diversity is associated with contradictory trends, namely, benefits from rich capabilities and information, however, also risks of fragmentation and fault-lines (Vanaelst et al. 2006; Nikiforou et al. 2018; Mathisen and Rasmussen 2019; Fiorentino et al. 2022; Tagliazucchi et al. 2022). This in a context of variation between USOs in innovation, i.e. radical vs. more incremental innovation, and business model, i.e. service vs. manufacturing, and variation in risk-taking in accessing external resources, mainly financial capital in local entrepreneurial ecosystems (Anselin et al. 1997; Vedula and Kim 2019; Stam and Van de Ven 2021). The key question is whether rich and varied ecosystems in metropolitan area merely reinforce positive start-up development, or can also support in reversing negative development rooted in poor founding teams. The paper falls apart into two parts, a quantitative exploration of business performance of USOs and a qualitative exploration, derived from case studies that cover persistently poor team development versus balanced management teams.

The first part, as quantitative groundwork, explores influence of diversity in founding teams and early networks on business performance, in a metropolitan (South Randstad in The Netherlands) and non-metropolitan ecosystem (Trondheim region, Norway) (e.g. Flåten et al. 2015). To that purpose, a survey of about 100 USOs is used to assess a regression model business performance including above-mentioned factors. The trends suggest that founding team diversity (education, pre-start work experience) of USOs has a negative relationship with business performance, while diversity in networks tends to have a positive influence, which is reflected in a positive influence of a metropolitan ecosystem. The results also confirm typical mechanisms in USOs founding team formation, namely, a relatively weak rational goal-oriented process prior to foundation which

requires a ‘balancing’ (Visintin and Pittino, 2014; Clough and Vissa, 2018). Such process seems already taking place, given the positive and relatively strong relation between USOs performance and domestic social networks.

In the second part, using 15 selected case studies covering 10-20 years of USOs’ life, the perspective on USOs performance is broadened with innovation radicalness and market introduction of the invention. Accordingly, the interplay of management team and networks with innovation suggests several ‘life trajectories’, including closure (bankruptcy). For example, persistent weakness in team composition tends to lead to firm closure without market introduction, or to failure later-on in upscaling of production. Such negative developments seem not to be affected (reversed) by the character of entrepreneurial ecosystems, but in non-metropolitan area a negative situation may become worse. For example, persistently weak teams in specialized clusters (e.g. supply to oil/gas industry, wind turbines) may suffer from large and tight financial consortia that easily provide (too) large amounts of venture capital to USOs, which later on fail to pay back in time (Norway). By contrast, if founding teams are balanced, often through adding marketing staff or through maintaining or building of co-creation networks with the parent university, market introduction and scaling-up may be accelerated, and this can be reinforced in metropolitan ecosystems. In addition, there is also a trajectory in which USOs’ performance seems not affected by founding team dynamics and also not by the entrepreneurial ecosystem, due to strong integration with the university as a research service firm. All-in-all, four different life trajectories are identified and discussed. Subject matter for informing management of incubators, accelerators etc., and local/regional policymakers, and for design of future research, conclude the paper.

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