

# **Let's make a spin-off! How academic researchers approach the business**

## **Strand A – Academic paper**

### **Suggested theme: 4. Universities as interactive partners**

#### **Subtheme: Mapping university-business relationships, including university spin-offs**

#### **Extended Abstract**

##### State of the art:

The socio-economic benefits produced by the university in the development of research and high-level education are recognized as important sources for the innovation of industries and regions, in some sectors in particular (Mansfield e Lee, 1996; Anselin et al., 1997). More recently, the attention has been focused on those benefits brought by the presence of university third function, with a progressive interest for the activities and the tools of the technology transfer (Etzkowitz and Leydesdorff, 2000; Mowery et al, 2002). Literature has investigated various types of technology transfer mechanisms (Lee, 1996; Friedman and Silberman, 2003; Rothaermel et al., 2007; Grimaldi et al., 2011)), among which: contract research mechanisms, university patenting and licensing, and spin-off promotion. Each mechanism has its own specificities, but in any case the technology transfer is understood as a complex process, which involves the formation, modification and transfer of information, knowledge and competencies between two or more agents usually belonging to the world of research and to the world of enterprises.

However, despite the great emphasis on technology transfer, only a few number of contributions have tried to enter the black box of the process (or to disentangle the many processes into which technology transfer can be articulated, Bozeman, 2000), explaining how different ideas, knowledge and competencies are produced, transformed, absorbed by the agents and, finally, how they enter the market (Clarysse et al, 2011; Åstebro et al, 2012).

##### Purpose of the paper:

The paper aims to contribute to the understanding of the nature of technology transfer processes, by investigating the case of academic spin-offs. Although this mechanism of technology transfer is among the most studied in the literature (O'Shea et al, 2005; Bekkers et al, 2006), we think that some of its peculiarities deserve a “plus” of attention. We adopt an evolutionary approach to the study of the antecedents and the consequents of a spin-off formation (Winter, 2011). By doing so, drawing on Weeks and Galunic (2003), we take firms as groups of ideas, beliefs, assumptions, and heuristics. By looking at the evolution of a spin-off, our aim is to highlight how and where does the project idea originate, how it develops and transform over time, how beliefs, assumptions and heuristics changes over time, how they are absorbed by the member of the spin-off, and – finally - how they becomes object(s) that enter the market. In so doing, we try to investigate more directly

processes, routines and procedures which lie at the ground of the transfer of knowledge and competencies between academia and the industrial world, in different stages of the spin-off evolution. We aim to add to recent literature on “academic entrepreneurship” by improving present understanding of processes by which academic entrepreneurs accumulate resources and skills to be successful in the market. Moreover, analysing the micro-foundations of new ventures creation by academics, we include the evaluation of the role played by social processes (Felin et al., 2012). Long term university-industry relationships may have a positive impact on academic entrepreneurship. We believe that contexts are important in fostering spin-offs. By analysing the social networks to which academics belong we can infer on the ecology of ideas (Staber, 2008, 2012) that lead to the spin-off formation. Network characteristics, network position and network evolution are all key aspects to be taken in account.

### Methodology:

Our empirical analysis combines quantitative and qualitative methods. Through ethnographic interviews to the founders’ team of 50 academic spin-offs promoted by the University of Padua during the 2000s (that is, all the spin-offs that have been promoted by this university), and 500 university professors we try to detect what kind of deficits or obstacles, as well as what kind of successful elements are prevailing during the various stages of firm evolution. We investigate social processes leading to academic entrepreneurship by means of social network analysis tools applied to the network of relationships of academics, before and after the spin-off creation. We evaluate the determinants of the success of a spin-off by identifying a set of relevant factors, such as number of university-industry relationships, number of patents, experience, financial support, marketing capabilities, institutional support, academic research policies, heterogeneity of competences in spin-off members.

### Findings and interpretation:

Our findings inform on the complex business and innovation ecosystem which sustains a spin-off company. We find support of the importance of supporting entrepreneurial skills and industry interactions. By recognizing the heterogeneity of academic entrepreneurship and context heterogeneity we suggest to use caution in shaping innovation policies, which must be more focused on the individual patterns of idea developing.

**Keywords:** academic spin-off, technology transfer, ecology of ideas

### **References**

- Anselin, L., Varga, A., Acs, Z. (1997). Local geographic spillovers between university research and high technology innovations. *Journal of Urban Economics*, 42(3): 422-448.
- Åstebro T., Bazzaziana N., Braguinsky S. (2012). Startups by recent university graduates and their faculty: Implications for university entrepreneurship policy, *Research Policy* 41: 663– 677.
- Bekkers, R., Gilsing, V., Steen, M. (2006). Determining Factors of the Effectiveness of IP-based Spin-offs: Comparing the Netherlands and the US. *Journal of Technology Transfer*, 31: 545–566.

- Bozeman, B. (2000). Technology transfer and public policy: a review of research and theory. *Research Policy* 29: 627–655.
- Clarysse, B., Tartari, V., Salter, A. (2011). The impact of entrepreneurial capacity, experience and organizational support on academic entrepreneurship. *Research Policy* 40: 1084– 1093.
- Etzkowitz H., Leydesdorff L., 2000, The dynamics of innovation: from National Systems and “Mode 2” to a Triple Helix of university–industry–government relations, *Research Policy*, vol.29, n.2, pp. 109-123.
- Felin T., Foss N.J., Heimeriks K.H., Madsen T.L. (2012) Microfoundations of Routines and Capabilities: Individuals, Processes, and Structure. *Journal of Management Studies* 49 (8): 1351-1374.
- Friedman, J., Silberman, J. (2003). University technology transfer: do incentives, management, and location matter?. *Journal of Technology Transfer*, 28: 17-30.
- Grimaldi R., Kenney M., Siegeld D.S., Wright M. (2011) 30 years after Bayh–Dole: Reassessing academic entrepreneurship, *Research Policy* 40: 1045– 1057.
- O’Shea, R.P., Allen, T.J., Chevalier, A., Roche, F. (2005). Entrepreneurial orientation, technology transfer and spinoff performance of U.S. universities, *Research Policy* 34: 994–1009.
- Lee, Y. (2003). Technology transfer and the research university: a search for the boundaries of university-industry collaboration. *Research Policy* 25: 843-863.
- Mansfield E., Lee J.Y., 1996, The modern university: contributor to industrial innovation and recipient of industrial R&D support, *Research Policy*, vol. 25, n. 7, pp. 1047-1058.
- Mowery, D.C., Sampat, B.N., Ziedonis A.A. (2002). Learning to patent: Institutional experience, learning and the characteristics of U.S. university patents after the Bayh-Doyle Act, 1981-1992. *Management Science*, 48(1): 73-89.
- Rothaermel, F. T., Agung, S. D. and Jiang, L. (2007). University entrepreneurship: a taxonomy of the literature. *Industrial and Corporate Change*, 16, 691–791.
- Staber, U. (2008). Network evolution in cultural industries. *Industry and Innovation*, 15, 569–578.
- Staber U. 2012, The ecological foundations of creativity, in Belussi F., Staber U. *Managing networks of creativity*, Abingdon: 30-45.
- Weeks, J., Galunic, C. (2003). A theory of the cultural evolution of the firm: the intra-organizational ecology of memes. *Organization Studies*, 24(8): 1309-1352.
- Winter S.G. (2011) Problems at the Foundation? Comments on Felin and Foss. *Journal of Institutional Economics* Special Issue 02 / June 2011, pp 257 277