

## University spin-out companies and venture capital

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### Abstract

The creation of university spin-out companies that create wealth is a major policy objective of governments and universities. Finance is a catalyst of this wealth creation yet access to venture capital is a major impediment faced by these companies. In this article we adopt a finance pecking order perspective to examine the problems faced by those university spin-out companies seeking to access venture capital. We triangulate evidence from spin-out companies, university technology transfer offices and venture capital firms in the UK and Continental Europe to identify the problems and to suggest policy developments for these parties as well as government. We compare perceptions of high-tech venture capital firms that invest in spin-outs with those that do not, and also consider VCs' views on spin-outs versus other high-tech firms. Our evidence identifies a mismatch between the demand and supply side of the market. In line with the pecking order theory, venture capitalists prefer to invest after the seed stage. However, in contrast to the pecking order theory, TTOs see venture capital as more important than internal funds early on. We develop policy implications for universities, technology transfer offices, academic entrepreneurs, venture capital firms and government and suggest areas for further research.

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### 1. Introduction

The commercialisation of university activities has become a key part of the agenda for governments and uni-

versities. There has been a substantial rise in the creation of university spin-out companies (USOs)<sup>4</sup> (Lambert, 2003) as universities increasingly view equity ownership in a USO as an attractive alternative to licensing technologies in embryonic industries (Siegel et al., 2003a). In line with the Association of University Technology Managers (AUTM) in the US and other literature on spin-outs, we define a USO as a start-up company whose formation is dependent on the formal transfer of intellectual property rights from the university and in

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<sup>4</sup> We adopt the term spin-out but this is synonymous with the term spin-out used in US literature.

which the university holds an equity stake. This definition is important with respect to the role that universities may play in venture development and the venture capital search process.<sup>5</sup> It means that we focus on those USOs that, in principle, may be expected to have high growth prospects but which may face difficulties in obtaining finance and other resources to realize these prospects.

The financial returns to this increased interest in knowledge transfer from universities have so far been low (Shane, 2004; Siegel et al., 2003a). Poor performance has led to an interest in understanding the potential difficulties associated with university commercialisation. The Lambert Review of University-Business Collaboration, commissioned by the UK government (Lambert, 2003), pointed to the problems associated with a dominant emphasis on the creation of spin-outs per se and argued that there was a need to focus on the requirements to enable the USOs that are created to generate significant wealth. This Review is in line with learning experience of IMEC<sup>6</sup> in Belgium (Moray and Clarysse, 2005) and Chalmers University in Sweden (Lundqvist and Hellsmark, 2003). The case of IMEC, for example, shows how the focus has changed from maximising the number of spin-outs towards optimising the starting configuration of these spin-outs in order to create the maximum future value.

The complexities of the problems involved in the development of USOs are well-recognised (e.g. Autio, 1997; Carayannis et al., 1998; Clarysse et al., 2005; Druilhe and Garnsey, 2004; Fontes, 2005; Mangematin et al., 2002). These studies also indicate that these complexities may be associated with the heterogeneity of USOs in terms of their resource endowments, their business models and their institutional contexts. Universities face a number of resource constraints in creating successful spin-outs but they cite access to venture capital as the most important (Table 1), with access to other forms of finance also figuring highly.

The existence of a gap between the demand for finance from entrepreneurs involved in new ventures and the willingness of suppliers to provide this finance has long been recognised in policy initiatives to help fill that gap in the US (Shane, 2004), UK (Rothwell, 1985; Bank of England, 1996, 2001, 2003) and Continental Europe (European Commission, 2000). Venture capital (VC) firms' provision of risk capital has been

seen as a major solution to bridge the so-called equity gap for USOs. Venture capital firms can play a key role in enabling the development of new firms in new markets (Von Burg and Kenney, 2000) but venture capital firms in Europe especially have traditionally been criticised for being reluctant to invest in early stage high-tech investment (Murray and Lott, 1995; Lockett et al., 2002). The processes adopted by venture capital firms in screening potential investments have been widely researched (e.g. Shepherd, 1999; Zacharakis et al., 1999). However, the emergence of new ventures from universities, that have not traditionally been commercial environments, may introduce differences in the approaches adopted by venture capitalists. Commercialisation of activities through technology transfer is relatively new to many universities. Procedures for the realistic valuation of IP and its marketability are often poorly developed and designed (Leitch and Harrison, 2005). Understanding of the requirements of potential external funders may be quite low.

Although the culture and operating practices within universities may be changing in the context of technology transfer they are still very different from the private sector conditions familiar to providers of external finance. That problems arise in terms of communications between universities and external sources of finance is unsurprising and each needs to understand better the information and operational constraints to which the other is subject. For example, there has been growing recognition of the notion that ventures need to be in a pre-prepared state that enables venture capital firms to evaluate them more easily (e.g. Zacharakis et al., 1999; HM Treasury, 2001). As such, new ventures from universities, where the skills to prepare for venture capital investment are lacking, may face problems in attracting investment.

Shane and Stuart (2002) identify distinctions between USOs in terms of whether or not they are funded by venture capitalists. However, there has been a lack of analysis of demand and supply side issues concerning USO access to venture capital. Because of their importance for policies aiming to create wealth from the commercialisation of university research, this paper aims to fill this research gap by focusing on those ventures for whom venture capital may be appropriate but who may face problems in accessing it. For the purpose of this paper, we do not consider those USOs for whom venture capital is inappropriate, although these ventures may generate social and employment returns. We draw on research we have conducted in the UK, supplemented by our evidence from continental Europe, to address the following research and policy questions:

<sup>5</sup> In some jurisdictions, such as Sweden, the role of the university is much reduced as the intellectual capital belongs to the academic.

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