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The nature of academic entrepreneurship in the UK: Widening the focus on entrepreneurial activities

Maria Abreu[a,*], Vadim Grinevich[b]

[a] Department of Land Economy, University of Cambridge, Pembroke College, Cambridge CB2 1RF, United Kingdom
[b] School of Business, Leadership and Enterprise, University Campus Suffolk and Waterfront Building Neptune Quay, Ipswich, IP4 1QJ, United Kingdom

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ABSTRACT

We argue that the current focus of the academic entrepreneurship literature, which is mostly on patent-based activities such as spinouts and licensing, should be widened to also include other informal commercial and non-commercial activities that are entrepreneurial in nature. We define as entrepreneurial any activity that occurs beyond the traditional academic roles of teaching and/or research, is innovative, carries an element of risk, and leads to financial rewards for the individual academic or his/her institution. These financial rewards can occur directly or indirectly via an increase in reputation, prestige, influence or societal benefits. Informal activities are particularly common in disciplines such as the social sciences, the creative arts and the humanities and are often overlooked by TTOs and by the academic literature. Our aim is to fill this gap by empirically analysing the determinants of academic engagement in a wider range of activities than those that are typically considered. Our findings have implications for the practice of academic entrepreneurship, and for the effectiveness of university efforts to promote entrepreneurial activities via the formal IP system and through TTOs. Our analysis is based on a recently completed survey of UK academics, providing micro-data on over 22,000 academics in the sciences, social sciences, arts and humanities. The data are complemented using institution-level information on financial and logistical support for entrepreneurial activities.

1. Introduction

There has been growing awareness in recent decades of the importance of universities as sources of new ideas, inventions, and as key actors in regional and national innovation systems. This has resulted in significant policy initiatives such as the Bayh-Dole Act of 1980 in the United States to promote the commercial exploitation of inventions that result from government-funded research, and similar initiatives in European countries (Stevens, 2004; Mowery et al., 2004; Geuna and Nesta, 2006; Swamidass and Vulasa, 2009). Most universities in the UK now have dedicated Technology Transfer Offices (TTOs) tasked with identifying research of potential commercial relevance, and actively promoting its commercialisation (Wright et al., 2006).

The economic impact of university research has also come under increased public scrutiny, as policy-makers debate the future of current university funding models. For instance, the recent Independent Review of Higher Education Funding and Student Finance in the UK (Browne, 2010) stresses the need to tie university funding more closely to its economic impact. The issue of the competing roles of universities has also been considered in several recent books on the subject (Collini, 2012; Bok, 2003; Stokes, 1997; Geisler, 1993).

Crucial to the debate is the role of individual and institutional factors in determining the extent of academic involvement in these entrepreneurial activities. The now extensive literature on academic entrepreneurship has studied the factors that are conducive to commercialisation using a variety of methods, including in-depth interviews (Bains, 2005; Murray and Graham, 2007; Siegel et al., 2004), the analysis of publicly available metrics (Agrawal and Henderson, 2002; Azoulay et al., 2007; Breschi et al., 2007; Thursby and Thursby, 2005), and statistical analyses based on survey data (Bozeman and Gaughan, 2007; Klofsten and Jones-Evans, 2000; Landry et al., 2006; Link et al., 2007; Stephan et al., 2007). The focus has generally been on a small range of entrepreneurial activities. These include invention disclosures by academics to the TTO (Thursby and Thursby, 2005; Bercovitz and Feldman, 2008), patenting of research outputs (Agrawal and Henderson, 2002; Henderson et al., 1998; Owen-Smith and Powell, 2003; Stephan et al., 2007),

* Corresponding author. Tel.: +44 1223 746538; fax: +44 1223 338163.
E-mail addresses: ma405@cam.ac.uk (M. Abreu), v.grinevich@ucs.ac.uk (V. Grinevich).

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new firm formation (Di Gregorio and Shane, 2003; Murray, 2004; O'Shea et al., 2007; Stuart and Ding, 2006; Wright et al., 2006[1]) and the licensing of research outputs (Jensen et al., 2003; Markman et al., 2005; Siegel et al., 2003). There are several reasons for this relatively narrow focus. One is that these are the formal activities that are typically considered most closely mirror those analysed by the wider literature on entrepreneurship. A second is that these activities are relatively visible and easy to quantify, and their economic impact can often be estimated, in contrast to that of more informal activities which tend to occur "under the radar". A rare exception is Klofsten and Jones-Evans (2000), who study academic involvement in a range of activities, and find significant levels of engagement in informal activities such as contract research and consulting.

In parallel, the literature on university-business links has analysed academic collaborations with business and industry, and considered a wide range of knowledge transfer mechanisms, including contract research, joint R&D, consulting and sitting on advisory boards (Blumenthal et al., 1986, 1996; D'Este and Patel, 2007; Jensen et al., 2010; Lam, 2007). However, the bulk of the literature focuses on the factors that determine engagement from the point of view of the commercial partner, and few studies consider the motivations of individual academics. Notable exceptions are Louis et al. (1989), who study the determinants of academic involvement in activities ranging from participation in externally funded research to new firm formation; Ding and Choi (2001), who test whether a range of factors can explain if an academic scientist founds a company or rather takes on an advisory role; Chang et al. (2009), who analyse the individual and institutional determinants of patenting, licensing and spinouts; and D'Este and Patel (2007), who consider the determinants of involvement by science and engineering researchers in a variety of activities, including consultancy, contract research, joint research and training.

This emphasis of the literature on a relatively narrow definition of academic entrepreneurship has a number of important shortcomings. First, there is considerable variation across academic disciplines in the extent of involvement in different entrepreneurial activities. This is due to the type of knowledge that is prevalent in different disciplines, and the extent to which it can be protected using formal intellectual property (IP) protection methods such as patents. For instance, the literature has shown that spinouts are an appropriate mechanism for commercialisation in the life sciences because of the discrete nature of the inventions and long product-development horizon (Owen-Smith and Powell, 2001; Shane, 2004). In contrast, research in the humanities is often disseminated via public lectures and books written for a general audience; these activities are commonly accepted as entrepreneurial in the field.[2] Similarly, research in the social sciences is often of interest to the public and third sectors, so external activities mainly take the form of consultancy and contract research, which are more prevalent in those sectors.

Second, academic involvement in less formal activities has been shown to be of significant economic and social value for both the academics and external partners involved. Cohen et al. (2002) find that in most industries (with the exception of pharmaceuticals) a larger share of academic knowledge is conveyed to firms via consultancy or informal communications than through patents and other formal channels. Agrawal and Henderson (2002) confirm these findings from the academic point of view; the MIT professors interviewed for the study perceive that their research has influenced industry mainly through informal channels (such as consulting, hiring and recruitment, and research collaborations). Similarly, Link et al. (2007) and D'Este and Patel (2007) show that informal channels are an important component of academic knowledge transfer, providing access to materials, equipment and research funding which are perceived as more beneficial by academics than formal activities such as licensing and spinouts. Case study evidence also suggests that informal arrangements are mutually beneficial for academics in the arts, and organisations in the creative industries (Universities UK, 2010).

Third, the narrow focus of the debate has important policy implications. It has led to TTOs promoting commercialisation in fields that are seen to bring the most financial rewards for their institutions, and where inventions can be protected using formal methods such as patenting. As a consequence, TTO offices invest considerable resources in the promotion of patent-based entrepreneurial activities, and fail to support other, more informal activities, resulting in a potential loss of financial rewards and social welfare (Fini et al., 2010). Policy-makers have also used these arguments to withdraw funding from fields that are seen to have little economic impact.

There is consequently a gap in our understanding of how and why academics in disciplines beyond those traditionally studied by the literature exploit their research, and how individual and institutional factors determine the likelihood of involvement in different entrepreneurial activities. Our paper addresses this gap by analysing empirically, in a multivariate regression framework, whether the determinants of academic entrepreneurship that have been identified in the context of patenting, spinouts, licensing and other formal activities are also relevant when the focus is broadened to include an extended range of entrepreneurial activities. Our analysis is based on a new and unique data set of over 22,000 UK-based academics, collected over 2008–2009 (Abreu et al., 2009). The data cover all UK higher education institutions and the entire range of academic disciplines, and therefore allow us to analyse entrepreneurial activities across the entire cross-section of academia in the UK.

The remainder of the paper is organised as follows. Section 2 discusses the literature on academic entrepreneurship, and presents our conceptual framework. Section 3 describes our data sources and empirical methodology. Section 4 presents our empirical results and discusses our findings in the context of the previous literature. Section 5 discusses the limitations of our study, identifies policy implications, and concludes.

2. Conceptualising academic entrepreneurship

2.1. Literature review

A large literature has sought to define and explain the nature of entrepreneurship, with much of the research building on the seminal works of Schumpeter (1934) and Kirzner (1973). While views on a precise definition of entrepreneurship differ considerably, most scholars would agree with a definition of entrepreneurship as an activity that involves the innovative combination of resources in order to introduce new goods or services, ways of organising, markets, processes or raw materials. A number of characteristics are widely recognised as marking out the process of entrepreneurship. First, it involves the bearing of risks on the part of the entrepreneur, since entrepreneurial activities have uncertain outcomes. Second, it involves an organising effort, in the sense that it involves the creation of a new way of exploiting an opportunity. Third, the activity must be innovative, in that it does not replicate exactly something else that is already in existence (Shane, 2003). In practice, a

[1] See also Lockett and Wright (2005), O'Shea et al. (2005), Link and Scott (2005) and other papers in the special issue of *Research Policy* 34(7) on "The Creation of Spin-Off Firms at Public Research Institutions: Managerial and Policy Implications".

[2] See, for example, the programme of public lectures organised by Gresham College, and supported by the City of London Corporation since 1597. Academic speakers deliver free public lectures (there are over 100 events per year), an activity that confers prestige and influence on the speaker, and thereby reputational advantages and access to research funding. For details see http://www.gresham.ac.uk.