

Intellectual Property management in publicly funded R&D centres—A comparison of university-based and company-based research centres

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Abstract

Recent thinking on open innovation and the knowledge-based economy have stressed the importance of external knowledge sources in stimulating innovation. Policy-makers have recognised this, establishing publicly funded Centres of R&D Excellence with the objective of stimulating industry–science links and localised innovation spillovers. Here, we examine the contrasting IP management practices of a group of 18 university- and company-based R&D centres supported by the same regional programme. Our analysis covers all but one of the Centres supported by the programme and suggests marked contrasts between the IP strategies of the university-based and company-based centres. This suggests the potential for very different types of knowledge spillovers from publicly funded R&D centres based in different types of organisations, and a range of alternative policy approaches to the future funding of R&D centres depending on policy-makers' objectives.

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Keywords: Public R&D; Intellectual Property; Ireland; Spillovers

1. Introduction

Recent thinking on open innovation (Chesbrough, 2003), business eco-systems (Iansiti and Levien, 2004), and the knowledge-based economy (Cooke and Leydesdorff, 2006) stresses the importance of external knowledge sources in stimulating innovation. Policy-makers have recognised the importance of external knowledge by establishing publicly funded R&D centres (PRCs) with the objective of stimulating industry–science links and localised innovation spillovers (e.g. Feller, 2004; Debackere and Veugelers, 2005; Graversen et al., 2005). The effect which such publicly funded research centres can have on innovation and economic growth is the subject of a number of studies (Link and Scott, 2005; Debackere and Veugelers, 2005; Roper, 2000; Siegel et al., 2003; Chen et al., 2004), with others (e.g. Bigliardi et al., 2006) examining the

related issue of the role of Science Parks in technology transfer and economic development.

Beugelsdijck and Cornet (2001) suggest a useful distinction between two types of knowledge spillover which may arise from such publicly funded research: rent-based spillovers mediated through market mechanisms, and pure knowledge spillovers which result from un-priced knowledge exchange. Shaping both types of knowledge transfer is the management (i.e. identification, development and exploitation) of Intellectual Property by the PRCs and other organisations (Dietz and Bozeman, 2005). For firms, effective IP management may enable value to be created and sustained (Coriat and Orsi, 2002; Hanel, 2006). For universities, effective IP management can generate revenue through licenses and spin-out companies (Roper et al., 2004; Siegel et al., 2003; Lee and Win, 2004; Gloet and Terziowski, 2004).

Our objective here is to explore differences between the IP management practices of publicly funded research centres (PRCs) based in universities and firms, and consider how these may influence subsequent knowledge spillovers. Our study is based on a real-time monitoring

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exercise of the IP management practices in a group of UK PRCs established since 2002. This localised, and detailed approach, complements the more abstract but broadly based analysis of Guellec and Van Pottelsberghe De La Potterie (2004), for example, providing insights into the processes underlying local knowledge transfers. Our paper addresses the need highlighted by Link and Siegel (2005) for more specific micro-evidence on the operation of technology transfer initiatives in different national and regional contexts.

The remainder of the paper is organised as follows. Section 2 outlines our conceptual approach and empirical propositions. Section 3 reviews the policy context for our empirical study and describes our data sources and methods. Section 4 explores the IP management practices of the PRCs, and Section 5 indicates the influence which organisational context has on the IP strategies adopted by PRCs. Section 6 draws out the implications for regional knowledge spillovers and future policy decisions.

2. Literature and propositions

Our main interests here are the contrasting IP management practices adopted by PRCs in the very different organisational settings represented by universities and firms. Inevitably, these IP regimes will reflect—at least in part—the strategic objectives of the organisations in which the PRC is based (Bozeman, 2000; Bigliardi et al., 2006), any ambiguities in these organisational objectives (e.g. Jarzabkowski, 2005), and the situation of the specific business unit or department in which the PRC operates. In terms of university-based PRCs, for example, the historical norm has been the ‘open science’ model, where new knowledge is viewed as a public good, and universities placed little priority on IP ownership. EU (2004) argues that this open science model is most effective in stimulating commercialisation where “the technology has far reaching implications and where the risks of mis-appropriation by private interests are detrimental to the public interest” (p. 11). The incentive structure in the open science model, suggests that PRCs are likely to adopt an essentially passive approach to IP development and exploitation, instead investing any available resources in additional research activity. Commercialisation then depends on the absorptive capacity of firms, i.e. their ability to identify, absorb and appropriate new technologies developed by PRCs (e.g. Zahra and George, 2002). This may be a particularly pressing issue in less developed regions where the absorptive capacity of local firms is less well developed than that elsewhere (e.g. Rodriguez-Pose, 1999; Fernandez et al., 1996).

More recently, however, and most notably in the US since the Bayh-Dole Act, universities and public research organisations have placed increasing emphasis on their *private* ownership of IP, and consequently have had the incentive to adopt a more proactive role in IP development and exploitation. Marques et al. (2006, p. 535) refer to this

as the emergence of a ‘dual cognitive approach to academic science’, where academics seek to expand understanding and knowledge as well as seek opportunities to protect and commercialise their research results. This gives rise to the ‘licensing model’ (EU, 2004). Here, PRCs engage in basic research, but are proactive, and devote resources to, the identification, development and subsequent exploitation of IP—generally through patents and licensing (Siegel et al., 2003; Lockett and Wright, 2005). EU (2004) argue that this approach can generate substantial benefits: “It is estimated that at least half the new products based on university patents would not have been developed if the results had been put in the public domain without patent protection” (p. 11). The same report, however, questions whether the adoption of the licensing model has been as successful in Europe as in the US, viz. “mere application of the licensing model has not been able to generate the same level of financial or economic results [in Europe] as in the US” (EU, 2004, p. 11).

Mowery et al. (2004) argue that the increased focus on the commercialisation of university research has, however, at least in the US gone beyond the licensing model, influencing the nature of university research itself, this has “changed the research culture of US universities, leading to increased secrecy, less sharing of research results, and a shift in the focus of academic research away from fundamental towards more applied topics” (p. 1). In this ‘innovation model’, PRCs both adopt a proactive approach to IP development and exploitation *and* re-orient the type of R&D they are undertaking to bridge the gap between fundamental university research and its commercialisation. EU (2004) argue that the social benefits resulting from the adoption of this innovation model may be larger, and more regionally focused, than those from the licensing model: “certain PROs have pioneered the implementation of the Innovation Model with conclusive evidence of success in terms of increased new company generation, enhanced relations with industry and licensing activity” (p. 11).

In addition to the university-based PRCs we are also interested here in company-based PRCs, with a potentially important distinction being that between PRCs located in locally owned firms and those located in the local plants of multinationals. Research conducted by locally owned firms, for example, will tend to focus on building internal technological capabilities with results evident in terms of improvements in “locally anchored technological capability and internationalization” (Kumar and Aggarwal, 2005, p. 456). By contrast, the increasing globalisation of R&D may mean that PRCs based in multinational companies are part of an international R&D endeavour with implications for the type and focus of R&D which is conducted and potentially the spatial distribution of knowledge spillovers (e.g. Reddy, 1997). PRCs in locally owned firms are also more likely to need to devote internal resources to the development and exploitation of IP than PRCs in multinationals where IP development and protection may be a specialist function.

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