



To protect or not to protect? Modes of appropriability in the small enterprise sector

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ABSTRACT

What appropriation strategies are chosen by innovative small firms? A cluster analysis of data from the German CIS was carried out to identify four distinct modes of appropriability in the small enterprise sector. The results show that for many innovative small firms the key question is not whether to use intellectual property rights (IPRs) or not, but whether to protect their innovations from imitation at all. Furthermore, formal and informal innovation protection mechanisms should not be seen as mutually exclusive, since several are employed jointly. Secrecy and lead time advantages over competitors are often combined with IPRs. Yet, a number of small firms use complexity of design as a substitute to patent protection. The relevance of each appropriation mode depends on such factors as the degree of innovativeness, the type of innovator and the general market environment, which implies that the importance of IPRs is limited to specific business contexts. Furthermore, regarding firm performance as measured by innovation effects, some evidence is found that choosing both IPR- and non-IPR-oriented appropriation strategies can prove to be effective in achieving company goals. Taken all together, the study implies that the use of IPRs by innovative small firms is highly selective. The paper concludes with a discussion of the implications for policy and research.

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1. Introduction

The varying ability of innovators to protect themselves from imitation and to appropriate an adequate proportion of innovation returns is regarded as an important driver of diversity in innovation activities both at the firm and the sector level (Levin et al., 1985; Pavitt, 1984; Teece, 1986).

Intellectual Property Rights (IPRs), especially patents, play a major role in this discussion. In theory, IPRs are an effective mechanism for resolving the appropriability problem of knowledge. Indeed, the standard justification for granting IPRs is that they induce incentives to produce socially desirable innovations, thereby mitigating the effects of innovation market failure (Granstrand, 1999; Greenhalgh and Rogers, 2007; Guellec and Van Pottelsberghe de la Potterie, 2007). Based on this assumption, the fostering of IPR usage by small and medium enterprises (SMEs) is regarded as an integral part of innovation policy. Despite their widely recognized importance for innovations, smaller firms often refrain from using registered IPRs. One explanation may be that SMEs are disadvantaged by their smaller company size when it comes to the awareness, acquisition and enforcement of IPRs

(Cohen et al., 2000; Hall et al., 2003; Lanjouw and Schankerman, 2004; Macdonald, 2004; Rothwell, 1983). Thus, to attenuate these potential impediments to innovation the strengthening of IPR usage by SMEs is regarded as a major task for policy makers (European Commission, 2006; PRO INNO Europe, 2007; Radauer et al., 2007; WIPO, 2003).

However, according to Jensen and Webster (2006) this must not be the end of the story. They argue that policy makers should first take into account the general appropriability conditions that small firms face before focusing on their ability to utilize IPRs. Similarly, albeit more generally, Scotchmer (2004) points out that it is always better to start from the appropriability problem itself rather than assume at the outset that IPRs are the best solution. Hence, two aspects take on special interest.

Firstly, the prevalence of innovation market failure in sectors or industries has to be assessed. In the present context this depends to a large degree on the inherent replicability of technology and the subsequent ease of imitation by competitors. At one extreme there is market failure because the relevant knowledge base is fully codifiable, leaving the marginal costs of imitation at zero. In this instance one would expect a strong positive link between IPR protection and innovation incentives. At the other extreme the critical knowledge base is highly tacit in nature. Apart from the hiring away of key employees, imitation by competitors may now be impossible. Lack of innovation incentives owing to low appropriability

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should therefore be less of a problem, since a high degree of knowledge tacitness serves in itself as a strong protection mechanism (Dosi et al., 2006; Hurmelinna-Laukkanen and Puumalainen, 2007; Jensen and Webster, 2006; Teece, 2002, 2003). Indeed, much of the operating knowledge in small firms tends to be tacit. Tacitness therefore works as an effective appropriation method, in particular for small firms (Nooteboom, 1994). Moreover, patents may not be available to a great number of small firms precisely because their tacit knowledge base cannot be reduced to codified information.

Secondly, even in the case of potential market failure a low level of IPR usage does not give rise to public concern when effective remedies are available. A number of studies have shown the relative unimportance of IPRs as a means of profiting from innovation. Other appropriation methods such as lead time, secrecy or complementary assets are deemed in most industries to be more effective than patents (e.g. Cohen et al., 2000; Harabi, 1995; König and Licht, 1995; Laursen and Salter, 2005; Levin et al., 1987; Mansfield, 1986).¹ Some of these studies also discuss the impact of firm size on the perceived effectiveness of IPR protection. Broadly speaking, they come to the conclusion that smaller firms are less likely to make use of IPRs because of cost and complexity issues, and instead probably rely on informal methods such as secrecy (e.g. Arundel, 2001; González-Álvarez and Nieto-Antolín, 2007; Hanel, 2008; Sattler, 2003).

Despite the economic significance of SMEs, however, very few studies explicitly address the general appropriability conditions of small firms and draw conclusions for innovation policy from their findings. Kitching and Blackburn (1998) examined this issue systematically for the first time (see also Kitching and Blackburn, 2003). From a telephone survey of small firms in the UK (four sectors: computer software, design, electronics, mechanical engineering) and subsequent face-to-face interviews, the authors showed that most SME owner-managers preferred informal protection practices (e.g. creating high-trust relations with customers and suppliers, maintaining a lead time advantage over competitors or operating in small niche markets) because they found them more familiar, cheaper, less time-consuming and more effective than IPRs. Furthermore, owner-managers saw these practices as vital to the commercialization of innovations and hence as a key component of their broader competitive strategy. Thus, the majority of small business owners did not consider access to or the use of IPRs as an impediment to the successful appropriation of innovation returns. Indeed, most owner managers were largely indifferent to the IPR system, since they felt that it neither facilitated nor hindered their innovative efforts. On the other hand, the use of IPRs was only reported under extremely selective conditions. SME owner-managers preferred IPRs in situations where the potential benefits were perceived to outweigh any potential acquisition or enforcement costs. Anticipation of a high degree of commercial innovation success, an appraisal of IPRs as more effective than informal methods and the possession of the necessary resources to acquire formal protection constituted the prerequisites here. From their results, Kitching and Blackburn (1998, 2003) conclude that policy attempts to remove barriers to IPR usage may have little impact on innovation by SMEs. In their view, instead of focusing on the protection of existing innovations through easier access to IPRs, policy makers should promote the introduction of new innovations in SMEs.

The study by Leiponen and Byma (2009) also has an explicit focus on small firms. According to these authors, the appropriation strategies pursued by small firms differ qualitatively from those of larger firms. In a survey of knowledge-intensive Finnish SMEs in the manufacturing and service industries, it is again shown that a

great number of small firms prefer informal protection practices to IPRs. Only highly R&D-intensive small firms and those that cooperate with universities in R&D saw patents as the most important protection instrument. Indeed, it becomes evident that innovation-related cooperation activities in general have a major impact on the kind of appropriation strategies chosen by SMEs. Furthermore, the majority of small firms did not consider secrecy to be the most important protection mechanism. Instead they tended for the most part to benefit from a speed to market strategy in their efforts to achieve a lead time advantage over competitors. From their results, Leiponen and Byma (2009) argue that small firms may be disadvantaged by their size in the use of IPRs, and suggest a critical re-evaluation of current patent-focused IPR policies. Moreover, they discuss several proposals on how the IPR system might provide more support for SMEs.

Using a large sample size, the aim of our paper is to corroborate existing empirical evidence and to deepen the understanding of appropriation strategies taken by innovative small firms. Several issues deserve further investigation. *Firstly*, SMEs should not be treated as a single entity. Instead, the strong skewness in firm size distribution toward smaller enterprises requires consideration with regard to the great diversity among small firms. In this way policy makers will be in a better position to meet the specific needs of certain SMEs (Curran and Blackburn, 2001). Taxonomies of innovation are a common method of accounting for such heterogeneity at the firm or sector level (Evangelista, 2000; Hollenstein, 2003; Jensen et al., 2007; Pavitt, 1984). As de Jong and Marsili (2006) have indicated, the taxonomic approach is particularly beneficial when studying the variability of innovative small firms. Yet, they did not focus on appropriation strategies in their identification and profiling of distinct clusters of small firms. We therefore seek to determine and characterize different modes of appropriability in the small enterprise sector. In this way, we will not have to treat the different innovation protection mechanisms under review as separate choices or even as mutually exclusive, as is the case in most studies on this topic (for an exception, see Amara et al., 2008). An examination of their interplay seems especially promising, since the strength of individual appropriation methods often lies in their combined use (Bosworth and Webster, 2006). As a further advantage we can interpret the use of IPRs by small firms within the context of their overall appropriation strategy. In so doing, policy makers may arrive at a better understanding of the general importance of patents in the ability of small firms to profit from innovation (Arundel, 2000).

Secondly, as the above discussion suggests, it might be argued that the less frequent SME usage of IPRs not only results from size-related disadvantages inherent in the IPR system but also reflects specific features of innovation protection practices in small firms. In fact, it is worth noting that small firms are not merely a scaled-down version of large firms (Penrose, 1959). Since the former are less likely to introduce R&D-intensive innovations that are fundamentally new, the novelty of their innovations is frequently determined differently from that of large firms. Because of behavioral advantages in terms of flexibility and speed of response, innovation in smaller firms is often associated with a better differentiation of existing products by focusing on superior customer service or by the fast, flexible and incremental adjustment of product quality to customer needs (Appiah-Adu and Singh, 1998; Baldwin and Gellatly, 2003; Mazzarol and Rebound, 2009; Wyncarczyk et al., 1993). As a result, for example, in consideration of the framework of Teece (1986), complementary assets such as sales, services or manufacturing capabilities may in many cases be of greater importance in the successful commercialization of small firm innovation than the protection of core technological know-how via IPRs. Thus, to determine whether the lower use of IPRs by SMEs might also be related

¹ See López (2009) for a comprehensive literature review on this topic.

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