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Crossing the innovation threshold through mergers and acquisitions

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ABSTRACT

Firms are resorting more and more to mergers and acquisitions (M&A) to bridge the gap between where they are and where they would like to be in relation to innovation and performance. This paper investigates whether involvement in M&A triggers distinct patterns of innovative behaviour across firms, and whether this effect is conditional on firm size. The analysis combines data from four waves of the Community Innovation Survey (CIS) and the Business Register of Dutch manufacturing firms. We observe that M&As influence the probability that firms will begin innovation activities or persist with them, and these effects vary at different points in the firm size distribution. In particular, by using M&A firms are able to persist with the innovation efforts and output over time, and this effect is especially strong for large firms. For small firms, M&A help them to cross the 'innovation threshold', increasing the probability of the transition from a non-innovator to an active innovator. However, the M&A effect does not mitigate the tendency of small firms to be occasional innovators.

1. Introduction

Building a successful innovation-based strategy requires resources and capabilities that are often difficult to develop internally (Teece, 1987) especially for small firms. Firms frequently are resorting to mergers and acquisitions (M&A) to bridge the gap between their existing condition and what they would like to achieve in relation to innovation and performance (Cassiman and Veugelers, 1999, 2002; Cefis, 2010). The performance effects of M&A are generally measured in the strategy and finance literature as cumulative abnormal returns (CAR) or returns on assets (Haleblian et al., 2009). However, several studies have looked at the consequences of M&A for innovative activities and innovative performance, noting also that is not always positive (Hitt et al., 1991). Although an M&A agreement is a popular means of accessing external technologies, it can lower managerial commitment and investment in R&D and, therefore, innovative output (Hitt et al., 1990, 1991). However, a growing body of evidence (Hagedoorn and Cloodt, 2003; Cassiman et al., 2005; Cassiman and Veugelers, 2007) shows that if the merger is motivated by the goal of acquiring new technology and is complemented by an efficiently managed knowledge transfer and integration process, it can have a positive effect on innovative performance. While these studies support the notion that technology-driven M&A help firms to increase their innovation levels, less is known about how they trigger changes in the patterns of innovation over time.

This paper focuses on two properties of innovation dynamics. First, we consider the degree of persistence in innovation. Several studies show that firms that have innovated or invested in innovation activities at a certain time are more likely to continue these activities in the future (Cefis, 2003; Peters, 2009; Raymond et al., 2010). This reflects the path-dependent and cumulative nature of the innovation process in which 'success breeds success' (Dosi, 1988). The question we investigate is whether a merger or an acquisition enhances the firm's innovation persistence, that is, the ability to cumulatively exploit its knowledge base by re-combining, and creating synergies with, externally acquired resources and capabilities. Second, we investigate what is referred to in the literature

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as the 'innovation threshold' (Geroski et al., 1997; Cefis, 2003; Gonzalez and Pazo, 2004). Innovative activity often requires that the firm changes its pattern of resource deployment, which usually involves irrecoverable ('sunk') costs – in new R&D facilities, the hiring and training of new personnel, and the marketing efforts required to launch a new product – associated with high levels of uncertainty about whether these investments ultimately will pay off. As a consequence, there is a minimum level of innovation, for example, the first product introduced to the market (Geroski et al., 1997) or the first patent granted (Cefis, 2003) that is more difficult for the firm to achieve than further innovations of similar impacts. We want to understand whether M&As, by giving access to additional resources and capabilities whose value has been proved in the acquired organisation, serve to lower the innovation threshold for the acquiring firm.

Most studies of M&A concentrate on transactions involving large publicly traded firms (Haleblian et al., 2009). However, M&As vary. In large firms the motivations for engagement in M&As are mainly financial or to achieve market dominance. In these cases, it is likely that the costs incurred by the post M&A integration process absorb energy and resources that could have been devoted to increasing the efficiency of other activities (DeMan and Duysters, 2005), and the process reduces innovative activity and produces negative effects on both capital and R&D spending (Schenk, 2006). Conversely, when the merging parties have complementary technologies and are motivated by value improvements, then the merger can generate innovations that otherwise would not have been achievable (Cassiman and Veugelers, 2007). These technology-driven M&As are becoming especially important for small and medium sized enterprises (SME). For SMEs, which tend to be less persistent innovators and to face more concrete 'innovation threshold' than large firms (Geroski, 2000; Cefis and Orsenigo, 2001; Cefis, 2003; Peters, 2009; Raymond et al., 2010), M&A may represent a viable strategy to overcome their innovative threshold. Following this line of reasoning we investigate whether involvement in M&A triggers distinctive innovation dynamics in firms of different size.

The empirical analysis relies on an extensive dataset of Dutch manufacturing firms with 10 or more employees, in the period 1994–2002, derived from two different sources: four waves of the Community Innovation Survey (CIS), and the Dutch Business Register (BR). The analysis focuses on the degree of 'state dependence' in the firm-level innovation dynamic, as represented by a Markov stochastic process. The objective is to establish whether innovation state dependence differs conditionally on having engaged or not in an M&A for firms in different size classes. For this purpose we calculate transition probability matrices (TPM) for M&A active and non-active firms and estimate a dynamic random effects (RE) discrete choice model. A firm's innovative status is defined by two complementary indicators: engagement in innovative activities, and realisation of innovative sales (or turnover). By analysing the dynamic properties of innovation conditional on M&A involvement and firm size, this study highlights the specific effects of M&A on innovation in relation to the ability to innovate persistently and to cross the innovation threshold, in a context of varying resource constraints. The study provides new insights on post-merger performance and contributes to the growing literature on the role of innovation in the M&A process.

2. Theoretical background

Although widely accepted as an important element of the firm's competitive strategy, M&As are generally not analysed in conjunction with innovation (Cassiman et al., 2005; Schulz, 2007). The focus in the M&A literature is mainly on the benefits deriving from economies of scale and scope on the one hand, and the costs of concentrated economic power among rival firms on the other (Burkart and Panunzi, 2008). However, scholars of innovation management have observed that because of the increasing complexity in innovation, firms are relying more and more on external sourcing strategies, including M&A. Despite the increased attention in the strategy and economics literature to the possible existence of a link between M&A and innovation, the question of whether M&A create, destroy or redistribute value related to innovation among the merging parties remains open.

The literature proposes several alternative views on the ways that M&A can affect the innovative potential of firms. Scholars writing in the Resource Based View of the firm posit that M&A increases innovative performance by enlarging the acquirer's knowledge base, technological know-how and technical capabilities (Ahuja and Katila, 2001). The acquiring firm gains access to new, valuable knowledge, which when combined with its own knowledge base, generates new innovations (DeMan and Duysters, 2005; Gerpott, 1995). From an economic perspective, expectations of a positive effect of M&A on innovation are based on the possibilities to exploit economies of scale and scope in R&D (Cassiman et al., 2005). A merger also may allow the firm to redeploy resources to more productive use (Ahuja and Katila, 2001).

On the other hand, in non-technology driven M&As, initiated for financial reasons or to achieve market dominance, the costs incurred in the integration process may absorb managerial and organizational resources that otherwise would have been devoted to other activities (Hitt et al., 1991; DeMan and Duysters, 2005). In these cases, M&A may be detrimental to innovative activity, and lead to negative effects on R&D inputs and outputs (Hitt et al., 1991; Schenk, 2006).

The industry organization literature assesses the impact of M&A on innovation in the context of post-merger R&D expenditure, or by investigating a series of research inputs, outputs and dynamic efficiencies simultaneously, showing a generally negative impact (for a review see Cassiman et al., 2005; Cefis et al., 2007; Schulz, 2007).

Taking account of the complexity of the innovation process, Arora et al. (2001), Ahuja and Katila (2001) and Cassiman and Colombo (2006) highlight that in technology driven M&A the emergence of technological synergies in the integration process can lead to increased ability to sustain innovation. All M&A processes involve major reorganizations in the merging parties: subdivisions are merged, divested or dissolved according to the objectives of the post-merger integration process. However, in firms engaging in technologically motivated M&A processes, post-merger integration is likely to be aimed more at achieving synergies and maximizing value. Technological M&A processes are seen as being motivated by value improvements and appropriation of the benefits from innovation. It is expected that the contribution of those firms embarking on these processes will increase the capabilities of the merged entity in terms of knowledge, human capital, financial resources, R&D laboratories, and access to intellectual property rights. Studies that focus on technology-driven M&As argue that if the merger involves technological components and motivations such as technological renewal and diversity, and a larger knowledge base, it will be more likely to have a positive impact on post M&A innovation performance (Ahuja and Katila, 2001; Cassiman et al., 2005; Cassiman and Colombo, 2006).

Our study complements this literature by looking at changes in firms' innovation behaviour and performance following a reasonable post-merger period. A technology driven merger should result in higher innovation performance at firm level. Specifically, we expect that those firms that were non-innovators before the merger, will be more likely to be able to scale the innovation