



The impact of cross-border mergers and acquisitions on the acquirers' R&D – Firm-level evidence[☆]



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ABSTRACT

This paper provides empirical evidence on the relationship between cross-border acquisitions and innovation activities of the acquirer. For the empirical analysis a unique firm-level data set is constructed that combines survey data for German firms with a merger and acquisition database. After a cross-border acquisition, investing firms display a higher rate of domestic expenditures for research and development. Controlling for endogeneity of foreign acquisitions by estimating a two-equation system with limited dependent variables and applying instrumental variable techniques it is found that part of this correlation stems from a causal effect. The estimated effects are robust towards alternative identification strategies and are higher in industries with high knowledge intensity. The analysis is complemented by an investigation of the effects on tangible investment spending and by a comparison of the effects of cross-border acquisitions to those of greenfield foreign direct investments and domestic acquisitions.

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1. Introduction

Foreign direct investment (FDI) flows have increased all over the world over the past decades to reach a volume of more than US\$ 1.6 trillion in 2011. Much of this increase can be attributed to the rising number of cross-border mergers and acquisitions (M&As).¹ From

the home countries' perspective, cross-border M&As can on the one hand enable market access and the transfer of knowledge from abroad which may strengthen domestic technological capabilities. On the other hand, there might be negative effects if domestic activities are replaced with similar investments abroad. From the host countries' perspective, many policy makers try to prevent foreign takeovers of domestic firm, especially in knowledge intensive industries.² The global effects of mutual restrictions on cross-border M&As depend on the effects on both the acquirer and the target firm. Thus, it is important to complement existing knowledge on the effects on innovation in target firms with empirical evidence on the investing firms.

Cross-border acquisitions constitute the main form of FDI in industries with a high R&D intensity (UNCTAD, 2007). The effects of international M&As on R&D have important policy implications since innovative activity is regarded as a key factor to spur productivity and growth. Existing empirical evidence on the effects of cross-border

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¹ http://unctadstat.unctad.org/ReportFolders/reportFolders.aspx?SRF_ActivePath=P,5,27&SRF_Expanded=P,5,27.

² One example is the announced acquisition of the Spanish energy company Endesa by the German energy provider E.ON in the year 2006 that was blocked by the Spanish government. Similarly, in 2005, the French government decided to impose restrictions on foreign acquisitions in several strategically important industries with high knowledge intensity like information systems and biotechnology.

M&As is mostly limited to target firms, while little is known about the effects on the acquiring firms.³

Only recently, cross-border acquisitions as a type of FDI started to receive more attention in the international trade literature. Recent theoretical contributions analyze the role of firm heterogeneity and different motives that determine the choice of foreign market entry modes (Nocke and Yeaple, 2007; Norbäck and Persson, 2007). These models argue that international M&As are mainly driven by the desire to acquire complementary assets and technology while greenfield investments (new firms or production units founded by foreign investors) do not provide direct access to foreign knowledge and are rather undertaken to exploit existing firm-specific assets of the acquiring firm or factor price differences across countries. If complementarities between acquiring and target firm play a role for cross-border acquisitions and these involve innovative activities it is likely that the effects on domestic R&D are quite different from those of greenfield investments. Hence, it is not possible to derive conclusions about the effects of cross-border M&As from existing studies on greenfield investments or aggregate FDI.

It is also likely that the effects of international acquisitions are different from those of domestic transactions since previous research argues that the motives and characteristics of cross-border M&As are different (see Shimizu et al., 2004, for instance). Theory suggests that the characteristics of firms that self-select into international acquisitions are quite different from those that engage in domestic acquisitions (see e.g. Nocke and Yeaple, 2008). Market access – for instance via access to existing networks or market specific knowledge like marketing capabilities – might be a more important motive for international than for domestic M&As (see e.g. Nocke and Yeaple, 2008; Guadalupe et al., 2012; Blonigen et al., 2012). Improved market access from the perspective of the acquiring firm may increase the incentives to invest in cost reducing or quality enhancing innovations as these can be applied to a larger production output. Further, as efficiency differences within an industry are likely to be more pronounced across than within countries (Neary, 2007) it is likely that foreign and domestic acquisition targets have different characteristics. This may result in different feedback effects on the investing firm as well.

The purpose of this paper is to investigate the impact of cross-border acquisitions on R&D activities of the investing firm. This paper contributes to the existing literature in several aspects. First, empirical evidence on the effects of international acquisitions on innovation activities of the acquirer is sparse.⁴ Further, I contribute to the industrial organization and the international economics literature by comparing the effects of cross-border acquisitions to those of domestic acquisitions and greenfield foreign direct investments. Heterogeneous effects according to industries and target countries with different characteristics are provided. For this purpose a unique firm-level data set is constructed that combines survey data for German firms with balance sheet data and an M&A database. The case of Germany is in particular interesting as it is one of the most technologically advanced countries in the world and is considerably engaged in FDI and global M&As.

The empirical framework accounts for unobserved firm heterogeneity and the possible endogeneity of cross-border acquisitions. The main results are based on a non-linear two-equation model in which the decision to engage in an international acquisition as well

as the decision of how much to spend on R&D is explained simultaneously. Identification is achieved by exploiting unexpected shocks to foreign market growth rates and variation in the distance to foreign markets across firms. The robustness of the results towards alternative empirical models and identifying assumptions is checked.

This paper is organized as follows. In Section 2, I summarize the related literature. Section 3 describes the empirical model and Section 4 provides a description of the data. Results of the empirical analysis are presented in Section 5. Section 6 concludes.

2. Cross-border acquisitions and R&D

This paper is related to several strands of theoretical and empirical literature that look at M&As from the perspective of industrial organization (IO) economics, strategic management, or corporate finance.⁵ As the M&A literature often does not distinguish explicitly between cross-border and domestic acquisitions or between effects on acquiring firms and acquisition targets it is worth taking a look at the literature on international trade and FDI as well. Cross-border acquisition can affect the investing firm's innovation activities through a variety of channels. First, there might be direct effects via relocation of R&D activities. Second, acquisitions may have an impact on other determinants of R&D that have been identified in the theoretical and empirical innovation literature such as a firm's size, market share, competition, technological opportunities, external knowledge sources, market demand, and financial factors (see, for instance, Cohen and Levine, 1989 or Hall and Mairesse, 2006 for an overview on the determinants of R&D).

The main motives for M&As within the IO literature are the strengthening of market power (Kamien and Zang, 1990) and the realization of efficiency gains (Röller et al., 2001). The effects on market power and efficiency also belong to the main channels through which M&As can affect R&D. M&As might be undertaken to gain access to target firms' assets such as production capabilities or intangible assets (e.g. Jovanovic and Rousseau, 2008). Efficiency gains after an acquisition may, for instance, stem from the diffusion of know-how within the merged entity (Röller et al., 2001) or the reallocation of technology to more efficient uses (Jovanovic and Rousseau, 2008). Synergies resulting from M&As might entail an increase in the efficiency of R&D which might increase the incentives to innovate.

Regarding the strategic aspect, a reduction in competition has a theoretically ambiguous effect on innovation incentives. This effect depends on market characteristics, the type of innovation, and the degree of R&D spillovers (see, for instance, Gilbert, 2006; Vives, 2008; Schmutzler, 2010 for a recent discussion). Reduced competition will increase a firm's residual demand – and thus the output to which cost reductions or quality improvements can be applied – but at the same time it tends to decrease the elasticity of demand and thus the impact of price reductions. However, if a merger solely reduces the number of firms in a market, it is likely that this induces a positive effect on innovation incentives (Vives, 2008). Further, the internalization of technology spillovers that have previously been captured by competitors can also increase the incentives for R&D (Kamien et al., 1992). Gilbert and Newbery (1982) argue that firms with monopoly power have additional incentives to engage in R&D due to the possibility of preemptive patenting.

Acquisitions that are motivated by strategic reasons also play a role in the international economics literature (e.g. Horn and Persson, 2001; Neary, 2007). Cost differences between firms might be more pronounced across than within countries and this may increase the incentives for cross-border M&As (Bertrand and Zitouna, 2006; Bjorvatn, 2004; Neary, 2007). In Neary (2007), for instance, cross-border acquisitions are accompanied by a reallocation of production from less

³ The effects of cross-border M&As on target firms have received considerable attention with respect to productivity (Arnold and Javorcik, 2009; Benfratello and Sembenelli, 2006) and employment (Almeida, 2007). Recently, particular attention has been paid to the effects of foreign acquisitions on innovation activity (Bertrand, 2009; Bertrand et al., 2012; Guadalupe et al., 2012; Stiebale and Reize, 2011).

⁴ Bertrand and Zuniga (2006) analyze effects of domestic and international M&As on R&D at the industry level. Firm-level studies that analyze differences between effects of domestic and international acquisitions on the acquirers' innovation include Desyllas and Hughes (2010), Cloodt et al. (2006) and Ahuja and Katila (2001), although analyzing effects of cross-border M&As is not at the core of their analysis.

⁵ The literature on cross-border M&As from the perspective of the management literature is surveyed in Shimizu et al. (2004).

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