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Unique synergies in technology acquisitions

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ABSTRACT

Acquisitions are often seen as an instrument to outsource the R&D function of the firm, but we know little over how acquirers profit from the redeployment of the target's resources. Using the strategic factor market theory as a guide, this paper explores the conditions under which technology acquirers capture value by generating unique synergies with the target. Analysis of a sample of technology acquisitions suggests that private synergies exist when the acquirer is more technologically proximate to the target as compared to other potential acquirers. This results in a higher acquisition likelihood and stock market reaction to the acquisition announcement. It is also shown that patent ownership allows acquirers to take advantage of heterogeneous resource complementarity and generate inimitable synergies with the target firm. But this effect is evident only in complex technology industries where a relatively high patent portfolio overlap increases the acquisition likelihood and stock market reaction to the acquisition announcement.

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1. Introduction

Corporate acquisitions are important means *via* which firms renew and reconfigure their technological resources (Capron et al., 1998; Karim and Mitchell, 2000). Indeed, high-tech sectors have witnessed increased acquisition activity over the past decades as acquirers are drawn by opportunities to access tacit and socially complex knowledge as well as avoid the uncertain process of internal technology development (Desyllas and Hughes, 2010; Phillips and Zhdanov, 2012). Not surprisingly, this has prompted management scholars to explore their performance implications. A large number of studies have focused on acquisitions' impact on innovation output and the different characteristics that mediate this relationship (Ahuja and Katila, 2001; Puranam and Srikanth, 2007; Valentini, 2012; Zhao, 2009).

While this line of work has provided crucial insights into the relationship between acquisitions and R&D performance, we know less about how acquirers profit from the redeployment of the target's technological resources. This is a key question given that acquirers increasingly see acquisitions as a way to outsource their R&D function (Higgins and Rodriguez, 2006). Here, the emphasis is not on the production of new knowledge but on how acquirers capture value by combining theirs with the target's resources.

In guiding this inquiry, the strategic factor market theory, which emphasizes the competitive nature of the market for corporate control, is an important anchor (Barney, 1986). According to this, acquirers profit when they are able to generate unique synergies with the target firm resulting from heterogeneous resource complementarity or private information (Adegbesan, 2009; Barney, 1988). But what lies behind unique synergies in technology acquisitions?

This paper presents a study of horizontal acquisitions in two high-tech sectors and identifies two channels *via* which unique synergies emerge and influence acquisition outcomes. The first relies on the informational advantages enjoyed by technologically proximate firms that address the problems of adverse selection in technology acquisitions (Higgins and Rodriguez, 2006; Ragazzino and Reuer, 2007; Reuer and Ragazzino, 2008). It is shown that firms that are *more* technologically proximate to the target firm as compared to other potential acquirers are more likely to acquire the target. In addition, the market is found to react positively to a relatively high technological proximity as investors infer that private synergies are likely to exist. Although technological proximity *per se* likely creates synergies (Bena and Li, 2014; Schildt and Laamanen, 2006), a relatively high technological proximity suggests that the acquirer understands much better the value and synergy potential of the target's technological resources and is therefore more likely to appropriate part of the value created.

The second channel is based on the heterogeneous resource complementarity generated by the ownership of patents that give

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rise to unique synergies (Adegbesan, 2009; Barney, 1988). In this case, acquirers profit not because of private information but due to the inability of other potential acquirers to replicate the synergy created. The presence of such inimitable synergies depends crucially though on the nature of the technology. In complex technology industries, e.g. semiconductors, innovation is cumulative and patents are primarily used as bargaining chips to negotiate cross-licensing agreements (Hall and Ziedonis, 2001; Merges and Nelson, 1990). This gives rise to important interdependencies and value creation opportunities when there is a high degree of overlap between the patent portfolios of the acquirer and the target. In contrast, patents work more like exclusion rights in discrete technology industries, e.g. pharmaceuticals, in which case a high patent portfolio overlap offers less scope for synergies to emerge. Consistent with this logic, we find that acquisition likelihood increases when there is a relatively high degree of patent portfolio overlap between the acquirer and the target but only in complex technology industries. Similarly, the market reacts more positively to a relatively high patent portfolio overlap in complex technology industries as compared to discrete technology industries.

This paper contributes to the study of technology acquisitions and, in particular, to our understanding of how value is created and captured. It complements existing work that identifies technological relatedness, variously defined and measured, as a key variable that explains acquisition performance and target selection. In doing so, it draws attention to the importance of disentangling the various components of technological relatedness and identifying the type of synergies they give rise to. Technological relatedness can be operationalized in various different ways and, as a result, different measures often capture different patterns of resource interdependence and channels of value creation (Grimpe and Hussinger, 2014b; Sears and Hoetker, 2014; Zaheer et al., 2013). In addition, this study also emphasizes the importance of appreciating the competitive nature of the market for corporate control. High-tech sectors are characterized by increased competition for access to promising technologies so measuring synergy potential *vis-à-vis* that of other potential acquirers can enhance our understanding of target selection and value capture. In turn, this can help explain seemingly contradictory findings in the literature.

2. Theory and background

Corporate acquisitions in high-tech sectors have steadily gained prominence over the last decades. By providing technological input to the acquiring firm such as know-how, new sources of knowledge or intellectual property rights, acquisitions enable firms to reconfigure their resource portfolio and leverage the target's knowledge base and capabilities (Ahuja and Katila, 2001; Karim and Mitchell, 2000; Puranam and Srikanth, 2007). Access to scientists is also seen as a key motivation to undertake acquisitions, although their transition to a novel organizational environment can be challenging (Kapoor and Lim, 2007; Paruchuri et al., 2006).

One of the central questions in this literature is concerned with post-acquisition innovative performance. Do acquirers become more innovative? While the complementarities between internal and external R&D have been noted, there is evidence that acquisitions have an overall positive effect on invention output but a negative effect on invention quality (Cassiman and Veugelers, 2006; Valentini, 2012; Zhao, 2009). A number of variables mediate this relationship though, including absolute and relative size of the acquired knowledge base, technological relatedness or the decision to structurally integrate the target firm (Ahuja and Katila, 2001; Bena and Li, 2014; Cloodt et al., 2006; Puranam et al., 2006).

With acquirers exhibiting low R&D investment and deteriorating R&D productivity, acquisitions are often seen as an instrument

to outsource the R&D function of the firm (Bena and Li, 2014; Higgins and Rodriguez, 2006; Phillips and Zhdanov, 2012). This is not surprising given the increased uncertainty associated with R&D projects and the problems with adverse selection and high transaction costs in markets for technology (Arora et al., 2001). Acquirers favor the acquisition of young, innovative firms over the internal development of technologies and create value through the redeployment of the target's resources (Capron, 1999; Capron et al., 1998). This is because resource value is endogenous, that is resource value depends at least partly on other resources in a firm's portfolio. Hence, there are important synergies to be accrued when merging the acquirer and target's resources in the presence of complementarity or when the acquirer possesses idiosyncratic capabilities that increase resource productivity (Kim and Finkelstein, 2009; Makadok, 2001).

2.1. Value capture in technology acquisitions

Of course, value creation, that is the excess value or synergy created from merging the two previously separate corporate entities, is an important precondition for acquirers to profit. But value creation does not guarantee value capture. While there is empirical evidence broadly supportive of the generation of synergistic gains from acquisitions (Moeller et al., 2005; Mulherin and Boone, 2000), these synergies are not equally distributed between the merged entities. A number of studies demonstrate that bidding firms regularly fail to capture any value and synergistic gains are, to a large extent, captured by the shareholders of the target firm (Fuller et al., 2002; Moeller et al., 2005).

Barney (1988) suggests that this observation can be explained by the competitive nature of the market for corporate control. Corporate takeovers are similar to auctions, with bidding firms competing on the basis of their respective valuations. If the target is equally valuable to potential acquirers, the competitive bidding process will result in zero returns for the acquiring firm. Acquirers then profit by taking advantage of imperfections in the market for corporate control. Barney (1988, pp. 73–74) identifies three distinct possibilities: (1) when private synergies exist between a bidder and target, (2) when inimitable synergies exist between a bidder and a target, and (3) when unexpected synergies exist between a bidder and target.

Existing work identifies similarity or relatedness as an important precondition for unique synergies to emerge but results are somewhat mixed. Although similarity has been found to increase acquirers' performance (Finkelstein and Halebian, 2002; Hayward, 2002; Morck et al., 1990), this link is far from robust. In fact, a number of studies report positive correlations between resource differences, often referred to as complementarity, and acquirers' performance (Kim and Finkelstein, 2009; Larsson and Finkelstein, 1999). In other papers, neither resource similarity nor differences seem to matter (Hayward and Hambrick, 1997; Lubatkin, 1987; Singh and Montgomery, 1987). More specifically focusing on technology acquisitions, technological relatedness is found to increase acquisition performance but this result is not robust (Higgins and Rodriguez, 2006; Sears and Hoetker, 2014; Uhlenbruck et al., 2006). The literature on corporate diversification similarly points to the benefits of relatedness but this relationship is again not consistent while technological diversity has been found to actually increase the market value of diversified firms (Berger and Ofek, 1995; Graham et al., 2002; Miller, 2006; Rumelt, 1982).

These results suggest that the relationship between different resource combinations and value creation is complex and contingent on specific resource characteristics. Hence, different measures of technological relatedness or similarity are likely to capture different channels of value creation depending on the way these are operationalized (Zaheer et al., 2013). This point has been

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