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Fragmentation of Technology Ownership and Acquisition Strategy of Firms

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This paper examines how the fragmented ownership of complementary intellectual property (IP) rights affects firms' acquisition behaviour. We theorize that as the ownership of complementary IP rights fragments, the rate at which a focal firm engages in technology acquisitions will increase. Our predictions suggest that firms will expand their IP portfolios through acquisitions as a strategy to continue innovating when the ownership over strategic IP becomes exceedingly spread among technology holders. Furthermore, we propose that this positive relationship between fragmentation and acquisitions will be stronger for firms whose patent portfolios hold relatively less value compared to their peers, owing primarily to their diminished control over strategic IP. Using a unique longitudinal dataset from the biopharmaceutical industry, we find empirical support for our hypotheses.

Introduction

> Invention, and particularly modern invention… is a drama enacted on a crowded stage.
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> (Polanyi, 1944, p. 71)

Firms innovate by combining technological knowledge derived from internal research and development (R&D) with inputs generated outside the firm (Kogut and Zander, 1992). They strive to reconfigure the components of different technologies in new ways, while carefully strategizing their innovation paths to avoid infringing upon the intellectual property (IP) rights of other technology holders (Arora, Fosfuri and Gambardella, 2001). Obtaining access to complementary IP rights is critical for firms to generate and appropriate value from their investments in innovation, as technology owners can demand unreasonable royalties and upfront payments or engage in costly litigation. Thus, appropriability becomes a significant challenge, especially in fragmented technology markets characterized by widely dispersed ownership of IP rights (Heller, 2008; Heller and Eisenberg, 1998). In extreme cases, the arduous task of assembling all relevant IP rights can prevent firms pursuing innovations, as they risk being fenced in[1] by other technology holders (Ziedonis, 2004). Simply put, a firm's R&D activities may be blocked if external IP rights[2] owners can deny access or

All four authors contributed equally.

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[1]We build on the idea that firms in the same industry controlling valuable IP rights can block another firm's R&D activity.

[2]Since we are interested in examining how firms protect their R&D activities from being blocked, we focus on one particular type of IP rights, patent rights, which grant the patentee the right to exclude others from using the patented invention for a period of time. We use the terms IP rights and patent rights interchangeably hereon.