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## Licensing speed: Its determinants and payoffs

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### ABSTRACT

There has been much research interest in the speed of innovation, although few consistent findings have emerged. In this study, we unpack the innovation process and focus on the commercialization stage to examine two questions: Which licensor and patent characteristics determine the speed of licensing? How does the speed of licensing impact the royalties and lump-sum payments to licensors? We addressed these questions by proposing that licensing speed is influenced by variables for licensor prominence (*size* and *experience*), licensor knowledge structuration (*technological depth*, *technological breadth* and *experience*), and patent appeal (*forward citations*, *scope* and *complexity*). We predict and find that these variables work to increase the size, complexity and duration of the licensing-out task, while also allowing licensors to take their time to review, negotiate and select agreements with higher royalty rates. These findings are counter to arguments for a fast-paced innovation strategy, as it suggests that for the commercialization stage of the innovation process the relationship between licensing speed and licensor royalty rates rewards a 'less haste, greater payoff' approach.

### 1. Introduction

Innovation speed is considered an important organizational attribute that impacts firm performance (Kessler and Chakrabarti, 1996). Fast innovators have been found to have greater revenue returns (Ringel et al., 2015), more new product development (Acur et al., 2010), and growth in sales and initial public offerings (Eisenhardt, 1989). However, some scholars offer an alternative view showing that the fast innovation sometimes has disadvantages. For example, fast innovation is less likely to produce impactful and profitable outcomes (Steen and Dhondt, 2010) and has hidden costs linked to the mistakes and inefficiencies that come with innovating quickly (Crawford, 1992). To resolve this conflict and better understand the determinants and impact of innovation speed, we follow calls to unpack the innovation process for more nuanced, context specific examinations (Carbonell and Rodríguez-Escudero, 2009; Chen et al., 2005; Langerak and Hultink, 2008). Up to now, research on innovation speed has focused on the speed across all three stages of the innovation process: the conception of an idea, the development that idea, and the eventual commercialization of that idea (Kessler and Chakrabarti, 1996). In this study, we focus on the speed of one stage of the innovation process: commercialization and, in particular, the activity of technology licensing. We explore the determinants and impact of licensing speed, defined as the length of time between patent application and announcement of a licensing agreement.

Examining licensing speed is worthwhile for two reasons. First, licensing is an increasingly important method of innovation commercialization. There is a growing market for owners of patented technologies (i.e., licensors) to grant a license to others (i.e., licensees) to use, modify, and/or resell the patented technology in exchange for compensation (Athreye and Cantwell, 2007). Within just the U.S., it is estimated that the annual value of licensed technologies has increased from \$50 billion in 1997 to \$138 billion in 2014 (Moyer, 2016).

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Second, time is a central yet relatively unexamined aspect of licensing. As patented technologies are protected for a finite time period (e.g., in the U.S. and Europe it is 20 years from the filing date of the application), some studies have examined the duration and timing of the patent application, approval process and renewal fees (Popp et al., 2003; Dechenaux et al., 2003; Drivas et al., 2016; Gans et al., 2008). However, surprisingly little attention has been paid to licensing speed and its effects on licensing payments to the licensor. Similar to the research on innovation speed, the few studies that do consider the pace of licensing, the results are inconsistent. On the one hand, the view is that the longer it takes a licensor to license its patented technology, the greater the reduction in the protected time period for monopoly profits, which reduces the value of the technology to both licensor and licensee (Hegde, 2014; Markman et al., 2005). On the other hand, while fast licensing might result in returns sooner, this could be at the risk of a hurried sub-optimal deal and lower price that results in reduced returns overall (Allain et al., 2011; Mauleon et al., 2013).

One explanation for this counter view about the benefits of licensing slowly is that innovation commercialization involves ambiguous search effectiveness, uncertain IP rights, and difficult to predict valuations of the technology (Gans et al., 2008; Zeckhauser, 1996). As such conditions are also likely to affect the ability of potential licensing partners to locate and contract with one another (Elfenbein and Elfenbein, 2007), we suggest they would reward a careful and judicious approaching to technology licensing. In other words, hasty licensing could negatively impact both the initial lump-sum payments and the longer-term revenues from royalties linked to future use and sales of the technology. We suggest that an analysis of the licensor and patent characteristics can explain this inconsistency in how licensing speed impacts licensor payoffs.<sup>1</sup> This will help scholars and managers to better understand how the speed of one aspect of the innovation process (licensing), can help a variety of organizations (e.g., technology firms, universities, and patent assertion entities) to profit from their intellectual property.

We present and test a model based on the premise that licensor prominence (relative standing or status), licensor knowledge structuration (knowledge portfolio depth and breadth), and patent desirability increase the time it takes to reach a licensing agreement. These licensor and patent factors work to increase licensor visibility, standing, and expertise. This, in turn, provides licensors with an abundance of potential licensees that increases the size of the licensing-out task. It also provides confers licensors with a position whereby they take their time to review and negotiate the options to attain the most attractive payoff in terms of royalty rate or lump-sum payment. We present and test hypotheses based on this theoretical premise.

The empirical setting for our study is the U.S. biopharmaceutical industry. It is an industry with a growing market for technology licensing (Wuyts and Dutta, 2008; Schweizer, 2005) and one that is shaped by licensing and other forms of technology transfer (Shin and Lee, 2013). We examine the speed of biopharmaceutical patents leading to licensing agreements during the period 1993–2008, inclusive, of which 117 were licensed while 34,543 were willing to be licensed but ultimately were not. The results indicate that variables that reflect licensor prominence and licensor knowledge structuration act to increase the time it takes to reach agreements. We find that characteristics of the patent itself which reflect desirability such as forward citations and scope increase licensing time, while patent claims, surprisingly, reduce licensing time. Slower licensing speeds for those patents that were ultimately licensed result in higher royalty rates to the licensor.

## 2. Theory and hypotheses

Licensing is a transaction between two parties: a licensee and a licensor. The licensor owns the intellectual property (IP) and seeks to extract value from it in the form of licensing revenues or through agreements that provide access to other technologies or new markets (see: Shapiro, 1985). Licensors may also license-out their IP because they lack the financial, physical or intellectual resources to commercialize it (Gambardella et al., 2007) or to help reduce the incentives for other firms to develop competing IP (Gallini, 1984). Licensees, on the other hand, typically acquire patented technologies as a means of updating or diversifying their technological assets (i.e., as a form of R&D outsourcing). It is considered to be an important organizational learning activity (Pitkethly, 2001). Licensing-in can also be a protective strategy, whereby licensees acquire but do not commercialize technologies simply to thwart competitors accessing them (Cohen et al., 2000). These are some of the key strategic reasons that motivate licensors and licensees to license and will likely impact the time it takes to reach a licensing agreement.

Drawing upon the learning, alliance and innovation research literatures, we hypothesize how two licensor factors (licensor prominence and licensor knowledge structuration) and characteristics of the patent itself contribute to licensing speed and licensor payoffs (see Fig. 1). Licensor prominence is the extent to which licensors will be known to and attract licensees. A licensor's knowledge structuration is the breadth and depth of its technological knowledge portfolio (George et al., 2008). Our fundamental premise is that strength in both prominence and knowledge structuration increase licensor visibility, standing, appeal and expertise. This increases the number of possible licensees interested in a licensor's technology, which increases the size, complexity and duration of the licensing-out task. Furthermore, strength in prominence and knowledge structuration confer a 'seller's market' position and greater bargaining power on the licensor. Thus, in addition to drawing many possible licensing opportunities, prominent licensors are disposed to prudently review and wait for the most attractive offer.

In addition to licensor prominence and knowledge structuration, we also consider patent appeal. The more cited, the more complex and the broader a patent, the greater the interest from licensees because of the potential value associated with such characteristics. These effects all work to increase the size and duration of the licensing-out task, the licensor bargaining position, and the potential payoffs.

<sup>1</sup> When we refer to licensor "payoffs", we examine royalty rates and lump-sums paid to licensors. We cannot make inference about the final payment made to licensors which is ultimately linked to sales.

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