J. of Multi. Fin. Manag. 23 (2013) 208–234

Contents lists available at SciVerse ScienceDirect

Journal of Multinational Financial Management

journal homepage: www.elsevier.com/locate/econbase

Innovation or imitation? The role of intellectual property rights protections[☆]

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ARTICLE INFO

Available online 7 March 2013

JEL classification:
G1
O3

Keywords:
Innovation
Imitation
Intellectual property rights

ABSTRACT

We study how uncompensated research and development (R&D) spillovers – the leakage of proprietary information through imitation or theft – affect firms' investment decisions. Using variation in property rights protections across different regions within China we find that (1) uncompensated spillovers are greater in regions with weaker property rights, (2) such spillovers are associated with lower R&D expenditures, and (3) the latter is exacerbated in low property rights regimes. In addition to identifying a specific channel through which legal protections affect incentives for innovation and R&D, our results support arguments in the literature that the enforcement of property rights affects firm investment and growth.

1. Introduction

R&D investment is an intangible asset whose value is highly sensitive to the threat of expropriation. That is, absent strong property rights protections, firms will be unable to capitalize on their investment.

☆ Xin Yu gratefully acknowledges financial support from the National Natural Science Foundation of China (Grant Nos. 70902008 and 71272101).

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http://dx.doi.org/10.1016/j.mulfin.2013.03.001

Furthermore, as noted by Ayyagari et al. (2008a), many predictions stemming from the (Jensen and Meckling, 1976) nexus-of-contracts view of the firm rely on the extent to which the property rights assigned in contracts are protected in practice. As such, a natural research question is the association between law, finance, and firm-level investment. There is, however, limited evidence of this at the micro-level (Claessens and Laeven 2003; Desai et al., 2003).

We contribute to the literature by providing evidence of a specific channel through which legal protections affect incentives for innovation and R&D investment—the leakage of proprietary information through imitation or theft. We find evidence that R&D investments have positive spillover effects in that one firm's R&D benefits neighboring firms. However, when intellectual property rights protections are weak, a firm's ability to capture the gains from investment (by collecting fees from the neighboring firms) is limited, and this reduces the incentive to invest in innovation.

Using a sample of more than 300,000 Chinese industrial firms, and relying on the fact that local property rights protections vary across different regions within China, we find that R&D spillovers are larger in regions with weaker property rights protections and smaller in regions with stronger property rights protections. Such spillovers, in turn, are negatively associated with firms' research and development expenditures. The evidence also suggests that strong intellectual property rights protections discourage expropriation, thus mitigating the negative effects of spillovers on R&D investment, and encouraging innovation. These findings persist after controlling for other institutional factors including firms' access to external finance, local economic conditions, after considering the endogeneity of R&D spillovers using an instrumental variables approach, and after controlling for firm location selection effects using a two-stage Heckman regression.

We contribute to the literature examining aspects of legal protections, financial market development, and economic growth (for example, La Porta et al., 1997, 1998, 2000, and Carlin and Mayer, 2003). Research and development (R&D) is an important activity which, as noted by Brown et al. (2009), is a critical input to innovation and growth. At the same time, as highlighted by Lerner and Schoar (2005), little attention has focused on understanding the exact avenues through which legal systems affect financial development.[3] Our results also complement those of recent and contemporaneous papers. For example, Ayyagari et al. (2008b) report cross-country evidence that firms' innovative activities are closely related to institutional factors including competition and access to finance. In the context of China, Cull and Xu (2005) find that firms reinvest more of their profits when property rights protection and contract enforcement is stronger. Similarly, Long (2010) looks at business dispute resolutions in courts across China and reports that active court systems are associated with more: investment, adoption of technology, innovation, and complex transactions. Of importance, our findings suggest that strong property rights protections in certain regions of China are important in inducing investment in R&D, and spurring the entrepreneurial activity that is critical to China's long-term economic growth.

The remainder of this study is organized as follows. Section 2 provides further background and develops the hypotheses. Data and summary statistics are presented in Section 3. Section 4 shows methodology and empirical results. Section 5 concludes.

2. Background

Ayyagari et al. (2008a) hypothesize that there will be less investment and more opportunistic behavior if property rights are weak. Consistent with this view, Demirguc-Kunt and Maksimovic (1999) find higher levels of investment in fixed assets for firms in less-developed countries where property rights are stronger. At the industry-level, Claessens and Laeven (2003) report evidence of better property rights being associated with higher growth through improved asset allocation. Claessens and Laeven (2003) highlight the limited amount of work addressing such issues at the firm-level. Of the work that does focus on the firm, Besley (1995) reports a significant link between property rights

[3] Lerner and Schoar (2005) highlight that legal systems with weak contract enforcement impose constraints on the types on contracts that can be written, thus potentially distorting the contracting process for investors and adversely affecting entrepreneurial incentives.