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The venture capital certification role in R&D: Evidence from IPO underpricing in Korea

Jaemin Cho [a], Jaeho Lee [b,*]

[a] Graduate Program for Technology Innovation & Management, Pohang University of Science & Technology, Pohang, Republic of Korea
[b] Department of International Business and Trade, College of Politics and Economics, Kyung Hee University, 1 Hoegi-dong, Dongdaemun-gu, Seoul 130-701, Republic of Korea

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ABSTRACT

During the last two decades, a number of studies have documented how initial public offerings (IPOs) of equity often exhibit underpricing; such studies have also attempted to identify the reasons for this underpricing phenomenon. Utilizing information asymmetry theory and signaling theory, many studies have demonstrated that both venture capital investment and research and development (R&D) can be important factors that influence IPO underpricing. However, these studies have not demonstrated how venture capital might function as a moderating force between R&D investment and the underpricing of IPOs. This study investigates the relationship between R&D investment and the underpricing of IPOs to clarify the moderating effect of venture capital investment by using IPO data from South Korean high tech firms. The study draws samples from 591 IPO companies that registered with Korea Securities Dealers Automated Quotation (KOSDAQ) between 2001 and 2008. The empirical results indicate that R&D leads to significantly higher underpricing of IPOs. The findings further reveal that the participation of venture capitalists (VCs) has alleviative effects on the underpricing of technology-based IPOs due to VCs' certification role in the uncertainty of R&D activity; in addition, the R&D certification effect of VC is stronger for more reputable VCs.

1. Introduction

Initial public offering (IPO) underpricing (i.e., the difference between the offer price and the closing price of shares on the first day of trading) is widely evident in stock markets and has been a matter of significant interest among scholars and practitioners for decades. Many theoretical explanations have

* Corresponding author. Tel.: +82 2 961 0985; fax: +82 2 961 0622.
E-mail address: jaeholee@khu.ac.kr (J. Lee).

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attempted to account for the phenomenon of underpricing using information asymmetry theory. For example, previous researchers have theorized that underpricing is compensation for less informed investors seeking to avoid the "winner's curse" (Rock, 1986) or is a signaling mechanism for reducing the adverse selection problem (Allen and Faulhaber, 1989). Extended theoretical discussion has resulted in the broad acceptance of such information asymmetry-based explanations. Empirical studies of IPO underpricing have examined informational issues among the different parties by considering specific characteristics that influence the uncertainty about the firm's value, such as the company's age, offer size, underwriter reputation, and venture capital backing.

More recently, growing evidence has demonstrated that R&D relates to IPO underpricing (Guo et al., 2006). Several contributions to the literature show that investors are more likely to undervalue higher R&D firms (Aboody and Lev, 2000; Chan et al., 2001; Eberhart et al., 2004; Lev and Sougiannis, 1996). R&D contributes to information asymmetry in the IPO process for several reasons. First, company insiders might hold superior information about R&D projects. Second, because most IPO firms are young, investors have limited information that can help them accurately assess the feasibility of R&D projects. Third, companies usually expense and compose R&D investments with intangible assets, which are difficult to value (Rangan, 2005). Specifically, Guo et al. (2006) reported that companies are more likely to underprice R&D-intensive IPOs because R&D intensity induces more information asymmetry than non-R&D intensive. Recent studies on the relationship between R&D and information asymmetry have raised questions about whether "quality of R&D information" impacts the degree of information asymmetry (Balatbat, 2006).

Many financial studies on IPO underpricing have shown that financial intermediaries such as venture capitalists might play a role in improving these informational issues (Carter et al., 1998; Logue et al., 2002). According to Megginson and Weiss (1991), venture capital backing reduces IPO underpricing by playing a "certification" role to overcome the information asymmetries between well-informed insiders and less-informed outside investors. Much empirical research supports venture capital's certification role. In addition, as an intermediate and external financing source for young high-technology firms, venture capital plays an important role in the evolution of science- and technology-based start-ups, most of which are highly R&D intensive (Chen, 2009; Lockett et al., 2002). Some argue that venture capitalists' fundamental role is to invest in small high-technology companies, where information asymmetry is highest (Gompers, 1995).

Given that most venture capitalists invest in technology firms with high R&D activities, the current study analyzes how and when venture capital investment affects the credibility of the R&D information reported in the IPO prospectus. To this end, the study incorporates venture capital involvement in Guo et al.'s (2006) information asymmetry model. Specifically, the discussion herein conjectures that R&D may have an association with information asymmetry and that venture capital may impact information asymmetry related to the firm's R&D activities. Thus, the study examines the relationship between R&D and IPO underpricing as well as venture capital's moderating roles in the context of this relationship.

To test the hypotheses on the relationship between R&D and IPO underpricing when venture capital is involved, the Korean Securities Dealers Automated Quotation (KOSDAQ)—South Korea's secondary small and medium enterprise (SME) stock market—serves as the research setting. In regard to the promotion of the high-technology industry, the KOSDAQ market applies alleviative listing eligibility review requirements to new technology companies or high R&D-intensive companies for venture businesses (KRX, 2009). Hence, the KOSDAQ market has a higher concentration (80.4%) of high-technology industry sectors (e.g., IT, electronics, mechanics) than most stock markets of the world; moreover, Korean venture capital firms are also highly concentrated in the high-technology sectors in order to harvest their investments more easily. It is important to note that the majority of venture capital-backed IPO firms are technology companies in such industry groups as information technology (IT), bio-technology (BT), and culture technology (CT), which have higher R&D investment compared to non-venture capital-backed IPO firms (see Table 2). In terms of the total value of share trading, KOSDAQ is the second largest SME stock market in the world, following only the NASDAQ, and the largest SME stock market in emerging markets (WFE, 2008). This high liquidity offers a fundraising opportunity to venture capital companies and an active IPO market for venture capital firms' exit. All in all, such an active Korean IPO market provides a good research foundation for an empirical analysis to identify venture capitalists' (VCs) role in the uncertainty of R&D and IPO underpricing.