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Transactional-institutional fit: Corporate governance of R&D investment in different institutional contexts

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ABSTRACT

Management research has a rich history devoted to understanding how different types of equity holders facilitate effective governance of investment in research and development (R&D). But scant research exists on understanding how different types of debt effectively govern R&D investment and virtually no research exists on this topic across institutional contexts. Yet, similar types of transactions differ across institutional contexts. This study develops and tests a transactional-institutional fit view of debt governance of R&D investment, grounded in transaction cost economics, which examines the alignment or fit between bank loan debt, bond debt, and R&D investment in bank-based and market-based countries. Analyses of 7943 firms across 12 countries from 1997–2010 support the key proposition: in bank-based (market-based) countries, higher levels of bank loan debt coupled with higher levels of R&D investment increase (decrease) firm performance.

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1. Introduction

R&D investment creates intangible, knowledge-based assets that drive competitive advantage (Branch, 1974; Chauvin & Hirschey, 1993; Fryxell, 1990). Yet, effective corporate governance must cope with the transaction hazards caused by R&D investment, which generates firm-specific assets, uncertain and difficult to evaluate returns, and weak appropriability (David, O'Brien, & Yoshikawa, 2008). Debt compared to equity generally restricts flexibility to adapt to earnings fluctuations and curbs monitoring to evaluate firm investments. Thus, debt has been viewed as ill-suited to govern R&D investment (Balakrishnan & Fox, 1993; Hill & Snell, 1988; Vicente-Lorente, 2001; Williamson, 1988). However, debt comes in the form of bank loans or bonds. David et al. (2008) found that the strong relational ties between firms and banks in Japan led to positive firm performance effects when bank loan debt was combined with high R&D investment.

Despite these advancements in understanding how different corporate governance modes may be more or less appropriate to govern R&D investment, the characteristics and implications of bank loan and bond debt are embedded in the larger institutional context. Based on this premise, this study develops a comparative theoretical approach to understanding the mechanisms of fit of bank loan and bond debt to govern

R&D investment across different institutional contexts. Indeed, as Hoskisson, Hitt, Wan, and Yiu emphasized, “firm strategies, organizational structures, and governance mechanisms successfully pursued and implemented in a particular institutional context may not achieve the same outcomes in another institutional context” (1999: 445). Understanding how different institutional contexts drive firm-level effective governance of R&D investment is important given the link between innovation and economic growth—a recent article in this journal noted that a lack of innovation could contribute to an economic recession (Hausman & Johnston, 2014). This paper demonstrates theoretically and empirically that the type of debt—bank loan or bond—most effective for governing R&D investment depends on the institutional context—whether a firm is located in a bank-based or market-based financial system. Based on principles grounded in transaction cost economics (Williamson, 1975, 1985), the transactional-institutional fit view developed in this paper explores how the type of financial system affects the benefits and costs of bank loan and bond debt as a governance mechanism for R&D investment. Thus, this study examines the fit or alignment between transactions for bank loan and bond debt and the institutional context. The term “institutional context” may have multiple meanings. This study focuses on the distinction between two types of institutional contexts: bank-based and market-based financial systems (Demirguc-Kunt & Maksimovic, 2002; Levine, 2002).

Bank-based systems, in Germany and Japan, for example, are characterized by less active equity markets and a dominant role of banks in the national economy (Vitols, 2005). Strong ties between firm borrowers

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and bank lenders provide benefits to govern R&D investment—flexibility of initial bank loan agreements, monitoring of firm investments, and protection against appropriability (Aguilera & Jackson, 2003; Boot, 2000; Henderson & Cool, 2003; Levine, 2002; Rajan & Zingales, 2001). This paper explains how the attributes of bank-based systems reinforce the benefits of bank loan debt for governing R&D investment and mitigate the costs of bank loan debt, which include monitoring of managerial investment decisions and weak contract enforcement (Boot, 2000).

In market-based systems such as those found in the United Kingdom (UK) and the United States (US), firm-bank ties are weaker and more arm's length than in bank-based systems. In this context, bank loan debt provides fewer adaptation, monitoring and appropriability protection benefits to offset its greater costs in comparison to financing obtained on an active bond market. Though bond debt in both bank-based and market-based systems provides little in the way of adaptation and monitoring for governing R&D investment, bond debt has lower costs than bank loan debt (Rajan, 1992), particularly in market-based economies where mechanisms for reducing information asymmetry and facilitating market transactions are more developed. Thus, the use of bank loan debt to fund R&D investment (bank-governed R&D) is likely to have superior performance implications relative to bond debt to govern R&D investment (bond-governed R&D) in bank-based countries. In market-based countries, however, the positive performance effect of bank-governed R&D is likely to be weakened or reversed. Results from analyses of 7943 firms across 12 countries from 1997–2010 support these propositions.

2. Theory and hypotheses

2.1. Transaction hazards arising from R&D investment

R&D investment generates intangible, firm-specific assets (Hall & Lerner, 2010; Hillier, Pindado, de Queiroz, & de la Torre, 2011; Kochhar, 1996) more valuable in connection with other firm assets than alone (Helfat, 1994; Oral, Kettani, & Lang, 1991), and therefore the firm is more valuable as a going concern rather than in bankruptcy and or liquidation. Also, returns to R&D investment are uncertain, difficult to evaluate and may be unknowable for a substantial period of time. Finally, R&D investment generates knowledge that is proprietary to the firm and that competitor firms would benefit from through imitation (Teece, 1986). Therefore, appropriate governance for R&D investment requires flexibility to adapt to earning disturbances or fluctuations (O'Brien, 2003; Simerly & Li, 2000), mechanisms to facilitate effective information gathering and monitoring of firm investments (which reduces information asymmetry), and mechanisms to thwart leakage of knowledge to competing firms.

2.2. Equity and debt governance for R&D investment

Equity compared to debt is more appropriate to govern R&D investment. Equity is generally more flexible than debt to earnings fluctuations and facilitates on-going monitoring through the board of directors and through internal auditing rights (Williamson, 1985). Plus, equity holders benefit from R&D spillovers to other projects incentivizing equity holders not to leak valuable information to competitors. Numerous empirical studies show a negative relationship between R&D investment and debt financing (e.g. Balakrishnan & Fox, 1993; Long & Ravenscraft, 1993; Titman & Wessels, 1988; Vincente-Lorente, 2001).

But debt is not homogeneous. Researchers have distinguished between bank loan debt and bond debt. Compared to bond debt, bank loan debt possesses several characteristics that are appropriate to govern the transaction hazards caused by R&D investment. First, banks have greater flexibility regarding the terms of debt obligations through renegotiation and forbearance reinforced by expectations of long-term lending relationships (Boot, 2000; David et al., 2008; Kochhar & David, 1996; Williamson, 1988). Second, banks have monitoring advantages

due to their access to information (Datta, Iskandar-Datta, & Patel, 1999), often not readily available through public sources (Boot, 2000), and economies of scale in monitoring client firms (Ahn & Choi, 2009). Third, private contracts between banks and borrowers mean that public disclosure of firm proprietary knowledge is not necessary for the firm to access external funds. In contrast, bondholders typically rely on publicly disclosed information. Therefore, appropriability of proprietary knowledge is better protected with bank loan debt than with bond debt.

However, bank loan debt also comes with disadvantages—flexibility and monitoring costs. The flexibility to renegotiate initial terms and forbear initial agreements comes with weaker incentives by borrowing firms to adhere to initial loan agreements, often called the soft-budget constraint problem (Rajan, 1992; Sharpe, 1990; Weinstein & Yafeh, 1998). Further, Fama (1985) notes that the periodic renegotiation of bank loans provides potentially valuable information and signals to arm's-length lenders. To monitor borrowing firms, bank representatives meet with borrowing firms during and subsequent to loan origination regarding firm operations and future investments, and may visit firm facilities and meet with customers of borrowing firms (Berlin, 2012).

2.3. Bank-based and market-based systems

Based on the growing recognition that national institutional contexts shape organizational governance and economic activity (North, 1990; Whitley, 1992), the transactional-institutional fit view developed in this paper distinguishes between two well-recognized financial systems: bank-based and market-based systems (Beck & Levine, 2002; Boot & Thakor, 1997; Henderson & Cool, 2003; Kwok & Tadesse, 2006; Levine, 2002; Rajan & Zingales, 2001). In bank-based systems such as those found in Germany and Japan, market organization is centered on banks and financial institutions. Bank-based governance systems facilitate bank monitoring of firm strategy and investments due to the dominance of relationship banking in which monitoring is facilitated by on-going and long-standing relationships with banks. Further, ties between banks and firms are multiplex in nature, often involving joint debt-equity positions and bank representation on the board of directors, and provision of ancillary services such as insurance (Aguilera & Jackson, 2003; Levine, 2002; Yoshikawa & McGuire, 2008).

For example, in Germany, close borrower-bank relationships are the norm. Borrowing firms in Germany often concentrate external financing from bank loans on just a few banks, or even just one so-called "Hausbank" (Allen & Gale, 1995). Hausbanks develop strong relationships with firm borrowers and may have representation on firm boards (Harhoff & Körting, 1998). German banks often own equity in borrowing firms. And borrowing firms may even keep their shares of stock on deposit at their banks and allow their banks to exercise proxy votes on behalf of the borrowing firms. Further, less public information is available on firms (Allen & Gale, 1995), due to underdeveloped financial markets compared to market-based systems. Likewise, in Japan, firms often develop and maintain strong and stable borrower-lender relationships. Often, a main bank may either act as a lead monitor for a syndicate of subordinate banks that lend to the borrowing firm or may be itself a lending bank subordinate to another main bank (Aoki, Patrick, & Sheard, 1994). The main bank may even provide consul to borrowing firms about strategic activities such as acquisitions or divestitures (David et al., 2008).

In market-based systems, such as in the UK and in the US, banks play less of a central role as financial intermediaries between industrial firms and capital providers. Indeed, ownership by banks and financial intermediaries may be severely constrained or eliminated. For example, in the US a restriction on equity holding by banks of nonfinancial firms dates to the Glass-Steagall Act of 1933 (Allen & Gale, 1995). Relationships among financial actors (banks, institutional investors, financial analysts, etc.) are arm's length in nature (Rajan & Zingales, 2001). Congruent with the prevalence of arm's length transactions, securities

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