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Inside directors and the underinvestment of financial slack towards R & D-intensity in high-technology firms

Ibrahim A. Shaikh[a,*], Jonathan Paul O'Brien[c], Lois Peters[b]

[a] University of New Brunswick Fredericton, Faculty of Business Administration, Canada
[b] Rensselaer Polytechnic Institute, Lally School of Management, United States
[c] University of Nebraska-Lincoln, College of Business Administration, United States

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ABSTRACT

Agency theory emphasizes the role of outside directors in mitigating free cash flow (FCF) problems, such as overinvesting FCF's into negative NPV R & D projects. In this paper we draw on and extend agency theory to argue that the *underinvestment* of financial slack towards a persistently high R & D-intensity is actually a greater problem for high-tech firms. Specifically, we claim that inside directors play a critical role for the board in safeguarding R & D investment by monitoring the CEO, and mitigating informational asymmetries for independent directors. We test our theory using a panel-data set of S & P 1500 firms in R & D-intensive industries from 1997 to 2007. Our empirical analysis reveals that inside directors positively influence the relationship between financial slack and R & D-intensity, and that their ability to ensure cash holdings are used to preserve R & D matters the most during periods of financial distress.

1. Introduction

Agency theory (AT) has been used extensively in strategy research to study how corporate governance can promote R & D (Deutsch, 2005; Eisenhardt, 1989). Situations where agency costs are rampant is when managers have easy access to ample discretionary financial resources. On the one hand, readily available free cash flows allow risk-averse managers to more easily overinvest slack into negative NPV R & D, rather than pay dividends or buyback shares (Jensen, 1993). On the other hand, having ample slack on hand prevents abrupt cuts to R & D when something goes wrong, thus helping preserve R & D at all costs and abating underinvestment (Myers, 1977). In other words, liquidity prevents risk-averse managers from forgoing R & D when times are bad, but too much slack weakens internal controls and may lead to the funding of negative NPV R & D projects. As a result, existing research has documented a curvilinear, inverted U-shaped, relationship between financial slack and R & D (see Geiger & Cashen, 2002; Nohria & Gulati, 1996 for reviews).[1]

Even so, some studies now question the curved relationship between slack and R & D. For example, Lee (2015) finds a weak correlation between slack and innovation in the Korean context, and Herold, Jayaraman, and Narayanaswamy (2006) find that while a curved relationship does exist in the US, it never truly becomes downward sloping. These studies, however, fail to offer a solid theoretical reason for why this is so, thereby adding to the recent confusion. In order to provide clarification, we extend AT by stressing how R & D-intensive industries often defy the short-term marginal calculus of traditional AT (O'Brien & Folta, 2009). Indeed, as Hall (2002) highlights, Jensen's FCF-thesis has had limited appeal for innovation scholars because it is concerned with industries where persisting with R & D at all costs is not critical for sustained rents. Conversely, relentlessly allocating slack into R & D is needed in high-tech industries because the gains from R & D quickly dissipate, and rents are frequently fleeting (Helfat, 1997). Consistent investment in R & D, while difficult and often coming at the cost of short-term earnings, is associated with several positive outcomes that generate increasing returns well into the future (Kor & Mahoney, 2005). We thus extend AT to also include underinvestment of financial slack into R & D as a more severe agency cost for firms in R & D-intensive industries. For our main effect, H1, we assert that the increasing benefits that accrue from holding large amounts of cash more than offsets the marginal costs associated with opportunistic managers occasionally overinvesting into negative NPV R & D projects (Mudambi & Swift, 2014). As a consequence, while we do assert that the positive relationship between financial slack and R & D somewhat levels

* Corresponding author.
E-mail address: ishaikh@unb.ca (I.A. Shaikh).

[1] We follow the literature and are concerned with a firm's unabsorbed financial slack. We use the terms cash-holdings, financial slack, slack, financial resources, free cash flows interchangeably in this study.

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off, it will never truly become negative.

AT also emphasizes how the differences in risk preferences between principals and agents can result in drastically different views about how best to disburse a company's cash holdings (Castaner & Kavadis, 2013; Kim, Kim, & Lee, 2008). Prior studies, however, largely overlook the subtle differences in risk-horizons and incentives among members of the top management team, such as the CEO and inside directors that are both valuable members of the board (Hill & Snell, 1988; Zahra, 1996). According to AT, a board composed with a supermajority of independent outsiders is viewed as the hallmark of good corporate governance (Dalton, Hitt, Certo, & Dalton, 2007). Less appreciated, however, is the equal importance AT places on the internal controls of non-CEO inside directors (henceforth insiders) for monitoring and guidance. In their seminal study of AT, Fama and Jensen (1983) also stressed the many benefits retaining executive directors, in addition to the CEO, has for helping the board fulfill its fiduciary obligations. For instance, insiders have access to tacit knowledge regarding R & D, and can provide valuable advice to a CEO when it comes to R & D strategy (Baysinger & Hoskisson, 1990). Yet, following the passage of the Sarbanes-Oxley Act of 2002, retaining insiders on the board is increasingly uncommon, and many times the only inside director is also the current CEO (Joseph, Ocasio, & McDonnell, 2014; Mobbs, 2013). We, however, point out how even a few additional insiders on the board can help ensure financial slack is consistently allocated towards R & D (Harris & Helfat, 1997).

Thus, another gap this study addresses is investigating whether inside directors will temper the hypothesized monotonic relationship we argue that exists between slack and R & D in the high-tech sector. For H2, we assert that the critical role insider's play in helping resolve the many information asymmetries that exist between a board's outside directors and the CEO helps abate cuts to R & D (Masulis & Mobbs, 2011). Building on this logic, H3 and H4 postulate that insiders should play an even more crucial role preserving R & D during times of financial constraint (Kor, 2006). During a crisis, the board's attention shifts to using financial controls and paying back anxious creditors. When this is combined with the additional scrutiny of activist shareholders, this often incents outsiders to exit to hedge their own reputation risks (Marcel & Cowen, 2014). By contrast, insider's employment risk is tied to the future success of the firm, where the best executive directors are being groomed to succeed the CEO (Shen & Cannella, 2002). Thus, we claim that this further entices insiders to be better monitors during distress, ensuring that cash is used to preserve R & D at all costs. We use financial distress, or the inability to payback creditors, as our construct for crisis because it consists of poor performance that occurs from within a firm.

We test our extension of AT on a sample of 203 US firms drawn from a cross-section of R & D-intensive industries that are required to preserve R & D at all costs. Although the sample time frame (1997–2007) is slightly older, it remains a critical period in US corporate governance because the Sarbanes-Oxley Act of 2002 which mandates board independence was passed during this period (Dalton et al., 2007; Jensen & Meckling, 1976). We find a strong positive relationship exists between slack and R & D in high-tech industries; and while the rate of change does diminish, it never becomes negative. Also, not only do firms with more insiders consistently invest in R & D, we find during distress insiders help ensure R & D is preserved at all costs.

Our findings have strong implications for AT and management practice. We extend AT by drawing on studies that stress how the practical prescription to retain a supermajority of outsiders on the board can unexpectedly result in even more risk-aversion and poor monitoring (Guldiken & Darendeli, 2016; Manso, 2011). The AT prescription to retain a supermajority of independent directors is many times misinterpreted by managers to compose a board with all outsiders, which can paradoxically result in even more dependence on the CEO (Zorn, Martin, & Combs, 2012). Thus, our findings extend AT to include another important boundary condition for board independence, and show that retaining a few more executives on the board helps prevent abrupt cuts to R & D. The managerial implications of our extension of AT are twofold. First, despite the pressure placed recently by capital markets to payback dividends or buyback shares, this study highlights the long-term advantages of using financial slack to maintain R & D as a top priority. Also, while many firms have removed insiders from their boards, this study suggests they should continue to retain a few more insiders in order to ensure compliance with the AT mandate for board independence.

2. Theory and hypothesis

2.1. Financial slack, R & D-intensity & high technology firms

One of the unique corporate governance aspects of firms in high-tech industries is they tend to retain large cash reserves on their balance sheets (O'Brien & Folta, 2009). As R & D is highly risky and can take several years to generate any tangible returns, it is often the first thing to be cut if something goes wrong (Mansfield, 1969). Cash provides a much needed cushion of liquidity that prevents abrupt cuts to R & D, allowing risk-averse managers the ability to pursue R & D without fear of failure (Bromiley, 1991). Indeed, some high-tech firms such as Apple and Google have more cash on hand than many third world countries and leading financial service companies (Bates, Kahle, & Stulz, 2009). Still, even if slack does have tremendous benefits, excessively accumulating cash can also lead to poor innovation outcomes through the funding of negative NPV R & D projects because too much liquidity leads to a weakening of internal controls (Jensen, 1986). Likewise, often less is more, because financial constraints can promote corporate entrepreneurship by forcing risk-averse managers to improvise and find alternative means to grow a firm (Hoegl, Gibbert, & Mazursky, 2008). Thus, in order to reconcile both the benefits and costs associated with maintaining financial slack on reserve, scholars assert that a curvilinear, inverted-U shaped, relationship exists between cash and innovation (Nohria & Gulati, 1996).

Nevertheless, while a curved relationship may exist between slack and innovation success for most firms, we claim that a monotonic main effect exists between financial slack and R & D expenditure in high-tech industries. AT, being derived from economics, stresses the marginal benefits and costs associated with investing an incremental unit of cash into R & D (Kor, 2006). Yet because R & D is associated with increasing returns to scale, AT needs to be extended to include the long-term benefits of slack as well (Kor & Mahoney, 2005). For one, successful innovation requires a constant flow of steady investment into R & D over time rather than R & D expenditure that erratically vacillates in accordance with cash flow volatility (Helfat, 1997). Although R & D does entail high incremental costs because it comes at the expense of short-term dividends, relentlessly pursuing R & D results in gains that can multiply. For instance, studies show firms that are able to persevere with R & D, despite the noted setbacks, experience more highly cited patents and privileged industry positions (Rothaermel & Hess, 2007; Swift, 2015). Also, because high-tech firms are in industries with rich growth prospects, the abundance of positive NPV R & D projects further ensures a company's slack is not easily squandered (Lim, 2015). While cash can be hoarded by risk-averse managers, generating opportunity costs from forgoing positive NPV R & D, the dynamic nature of these industries makes it much more difficult to overinvest into negative NPV pet projects (Fama, 1980; Jensen, 1993). Thus, even at very high levels of free cash flows, the significant benefits of holding cash within arm's reach offsets the marginal costs that are incurred when mangers fail to pay out dividends. In sum, we predict a strong positive relationship exists between financial slack and R & D in high-tech industries, and while the relationship may somewhat level off, it will be monotonically positive and not become negative. More formally:

H1. (Baseline): For firms operating in high-tech industries, a positive relationship exists between financial slack and R & D-intensity.