The Relationship between Slack Resources and the Performance of Entrepreneurial Firms: The Role of Venture Capital and Angel Investors

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ABSTRACT

In this study, we seek to further delineate factors that condition the relationship between slack resources and firm performance. To do so, we develop and test a model that establishes the role of venture capital (VC) and angel investors as powerful external stakeholders who positively moderate the slack-performance relationship. In addition, we provide more insight into this relationship by examining differences between these two types of private investors and by examining the role of their ownership stakes. We test our hypotheses using a sample of 1,215 private firms, including VC-backed firms, angel-backed firms and similar firms without such investors. We find that the presence of VC investors positively moderates the relationship between both financial and human slack resources and firm performance, while angel investors only positively moderate the effect of human resource slack. Further, VC investors are only marginally better at helping entrepreneurs to extract value from human resource slack than angel investors and they are no better when it comes to financial slack. Finally, we find that the impact of financial and human resource slack on firm performance is more positive in VC-backed firms when investors hold high ownership stakes, an effect which is significantly stronger than when angel investors hold high ownership stakes.

Keywords: entrepreneurship, slack resources, venture capital, angel financing, firm performance
INTRODUCTION

Whether it is the abundance or scarcity of slack resources that is most beneficial to firm performance is a heavily debated topic (e.g., Bradley et al., 2011a). Prior research has generally argued for an inverted U-shaped relationship between slack resources and firm performance to reconcile these opposite views (Bourgeois, 1981; George, 2005; Nohria and Gulati, 1996; Tan and Peng, 2003). Nevertheless, simply having resources is not enough to create value out of those resources (Sirmon et al., 2007). More recently, scholars have therefore devoted increasing attention to when, where and how slack resources benefit firm performance. For instance, research has shown how the value of slack is influenced by the environment in which these resources are deployed (Bradley et al., 2011a; George, 2005). Moreover, how slack resources are managed may also influence their performance consequences. Simsek et al. (2007), for instance, found that managers’ capability to sense the market makes them better able to allocate slack towards entrepreneurial actions, which enhances the performance consequences of these resources.

While these prior studies have been informative in opening up the black box between slack resources and firm performance, they implicitly assume that managers “go it alone” when managing their resources. However, managers rarely operate in isolation and often have to deal with powerful exchange partners who may affect managers’ discretion over resources (Hambrick and Finkelstein, 1987). Venture capital (VC) and angel investors are such partners in entrepreneurial firms; in addition to providing financial resources in return for part of the ownership of firms, they actively monitor and influence how their portfolio firms are run after the investment (Mason and Harrison, 1996; Sapienza, 1992; Sapienza et al., 1996). In so doing, these investors may substantially affect entrepreneurs’ discretion over their resources and thus influence how these resources are managed (Hambrick and Finkelstein, 1987). Using insights from extant slack research and managerial discretion theory, we set out to examine how powerful exchange partners, such as VC and angel investors, influence the relationship between slack resources and firm performance.
Our paper makes three primary contributions. First, we contribute to the literature on slack resources. Researchers have recently acknowledged that resources do not exploit themselves (Sirmon et al., 2007). In examining when, where and how value is extracted from slack resources, specific attention has been paid to the role of industry environments (Bradley et al., 2011a; George, 2005) and managers (Bradley et al., 2011c; Simsek et al., 2007). Nevertheless, when managing their resources, entrepreneurs rarely act in isolation. Private investors, such as VC and angel investors, are typically one of the most important owners in entrepreneurial firms, ranked second behind entrepreneurs themselves (George et al., 2005). Unfortunately, the role of these private investors in resource value creation has been largely overlooked. We argue that VC and angel investors -through their active involvement in entrepreneurial firms- will act as a source of resource value creation. In so doing, we address an important gap in the literature as identified by Barney and colleagues (2011, p. 1306) “start-up and growing firms may be wholly owned by their founders or have involvement of angel investors and venture capitalists. Studies to date have not explicitly compared the different processes of resource and capability development in these different ownership contexts…” Our study is one of the first to show how outside investors not only contribute resources as such, but also help in creating value out of those resources.

Second, we contribute to the literature on managerial discretion. Researchers have examined a host of factors at the national, industry, firm and individual level that enhance or restrict the internal discretion of managers (e.g., Carpenter and Golden, 1997; Crossland and Hambrick, 2007; Finkelstein and Hambrick, 1990; Hambrick and Abrahamson, 1995). Despite this rich literature, Quigley and Hambrick (2012) recently noted that little attention has been paid to the idea that powerful parties might influence managerial discretion. This is especially the case for powerful external parties, such as VC and angel investors. Our study suggests that managerial discretion is distributed across organizational boundaries, with powerful external parties that are not managers of the firm. Moreover, contrary to that the general assumption that powerful parties may restrict
discretion (e.g., Hambrick and Finkelstein, 1987), we argue and show that these external parties may also enhance discretion, something which was only briefly suggested by Thompson (1967).

Finally, our study contributes to governance research. Researchers have long studied the relationship between ownership and firm performance, especially in established and new public firms, but mixed findings have emerged (Dalton et al., 2003). We do not focus on the direct relationship between ownership and firm performance, but rather study how different private investors (VC versus angel investors) with different ownership stakes (high versus low) influence resource value creation in the context of private firms. While prior research has argued that different types of owners may have different goals for investing (Zahra, 1996) and different preferences regarding the allocation of slack resources (Kim et al., 2008) this evidence again comes from investors in public firms. Our study highlights some important differences between different types of private investors, challenging the basic assumption that outside blockholders of equity (as a homogeneous group) by definition have both the incentive and influence to affect firm decision making (Dalton et al., 2003). We provide new insights into the role of investor professionalism, ownership and their joint effects on the performance consequences of slack resources in private firms.

THEORY

Slack Resources, Firm Performance and Managerial Discretion

Slack resources are defined as “potentially utilizable resources that can be diverted or redeployed for the achievement of organizational goals” (George, 2005, p. 661). Most of our insights regarding the consequences of slack come from samples of public firms (Bromiley, 1991; Danneels, 2008; Greenley and Oktemgil, 1998; Kim et al., 2008; Mishina et al., 2004), multinational organizations and their divisions (Nohria and Gulati, 1996; 1997) or established privately-held firms (George, 2005; Mellahi and Wilkinson, 2010; Simsek et al., 2007). It is only more recently that scholars have studied slack in young, small entrepreneurial firms as we do in this study (Bradley et al., 2011a,b; Patzelt et
al., 2008). While entrepreneurial firms are often portrayed as being resource constrained, this does not imply that slack cannot be present in these firms. First, entrepreneurial firms differ significantly in their early resource endowments (Shane and Stuart, 2002). Second, because all resources controlled by a firm are rarely ever fully utilized, there is always some slack (Bradley et al., 2011b).

Although slack resources vary in type, the majority of previous studies have focused on financial slack and more specifically the level of liquid assets in excess of those needed for basic operating expenses (e.g., Bradley et al., 2011a,b; George, 2005; Kim et al., 2008). In entrepreneurial firms, financial slack may result from early operations as well as from the initial stock of capital (Bradley et al., 2011a). A relatively small but growing stream of research has also focused on human resource slack, which refers to the number of employees in excess of those needed for operational demands (e.g., Mellahi and Wilkinson, 2010; Mishina et al., 2004; Welbourne et al., 1999). We focus on both types of resource slack because both financial and human resources are critical for the emergence and development of entrepreneurial firms (Cooper et al., 1994).

Multiple theoretical perspectives have been advanced to understand the performance consequences of slack resources, but opposing insights have emerged. On the one hand, behavioral theorists argue that slack resources will increase experimentation, innovation and risk-taking (Bromiley, 1991; Cyert and March, 1963; George, 2005). Slack allows firms to experiment with new projects, such as introducing products and entering markets (Hambrick and Snow, 1977). Although such projects may be risky, they are critical for the performance of entrepreneurial firms (Sapienza et al., 2006; Zahra, 1995). Moreover, slack shields firms from environmental turbulence (O’Brien, 2003). On the other hand, organizational economists argue that slack is detrimental for firm performance as it reduces the discipline that is exercised in the selection, support and termination of investment projects (Nohria and Gulati, 1997). Additionally, resource constraint theorists argue that slack decreases entrepreneurial ingenuity (Baker and Nelson, 2005; Mosakowski, 2002). Finally, slack may make entrepreneurs complacent and overly optimistic (Kim et al., 2008). Debruyn et al.
(2010), for instance, show that the presence of more financial resources makes managers believe they are able to react effectively to competitive attacks, but also makes them less motivated to do so.²

Scholars have reconciled these opposing views by arguing for an inverted U-shaped relationship between slack and firm performance. Specifically, the performance benefits of slack as advanced by behavioral theorists increase rapidly with slack, but then level off because there are only so many valuable opportunities out there which entrepreneurs can imagine (Hambrick and Finkelstein, 1987; Nohria and Gulati, 1997). The costs of slack are limited when slack is low, but start to increase rapidly when slack gets beyond a certain level (Nohria and Gulati, 1997). The net effect of these two mechanisms, an inverted U-shaped relationship, suggests that holding an intermediate level of slack is optimal in any organizational setting (Nohria and Gulati, 1997).

Slack resources, however, do not exploit themselves and simply possessing resources is not enough to create value out of those resources (Sirmon et al., 2007). Recently, scholars have started to open up the black box between slack resources and firm performance by examining when, where and how these resources influence performance. In this regard, specific attention has been paid to the role of managers (Simsek et al., 2007). Bradley et al. (2011c), for instance, showed that managers in firms with greater resource constraints learn to use their resources more effectively over time. An implicit assumption in these studies is that managers have significant discretion over their resources. According to managerial discretion theory though managers vary in how much discretion they possess, ranging from very little to a great deal (Hambrick and Finkelstein, 1987). That this may be important to consider was hinted at by Bradley et al. (2011a) who showed that financial slack is most beneficial for firm performance in low-discretion environments (i.e., hostile and stable industries). Nevertheless, much remains to be learned about factors that may condition the slack-performance relationship.

Managerial discretion theory stipulates that the degree of managerial discretion is a function of individual, organizational and environmental factors (Hambrick and Finkelstein, 1987). At the
individual level, discretion is determined by the degree to which managers are able to envision multiple courses of action (Carpenter and Golden, 1997; Hambrick and Finkelstein, 1987; Thompson, 1967). Similar to the entrepreneurial process of discovering, evaluating and exploiting opportunities (Shane, 2000; Venkatraman, 1997), the different courses of action managers are able to envision is largely determined by their cognitive limitations. At the organizational level, slack resources themselves play a key role in influencing managerial discretion (Finkelstein and Hambrick, 1990; Finkelstein and Boyd, 1998), while at the environmental level factors such as product differentiability and capital intensity influence discretion (Finkelstein and Hambrick, 1990; Hambrick and Abrahamson, 1995).

Most relevant to our study, and typically ignored by previous research, discretion theory indicates that powerful stakeholders may influence managerial discretion (Hambrick and Finkelstein, 1987). Specifically, stakeholders may create discretion by raising opportunities that will not come to mind of entrepreneurs who act alone. Thompson (1967), for instance, argues that outside investors may help organizations in finding more domains that are profitable. Conversely, stakeholders may constrain entrepreneurs’ deviant discretion or latitude to take action whenever such “an action lies outside the ‘zone of acceptance’ of [those] powerful parties who hold a stake in the organization” (Hambrick and Finkelstein, 1987, p. 374). In this study, we focus on outside investors, including VC and angel investors, who are generally viewed as powerful stakeholders in entrepreneurial firms. We argue that these investors will influence entrepreneurs’ discretion over resources through their active involvement. Consequently, they are expected to influence the underlying mechanisms which drive the performance consequences of slack resources in entrepreneurial firms. Below, we elaborate on this claim.

**How VC and Angel Investors Influence Entrepreneurial Discretion and their Impact on the Performance Consequences of Slack Resources**
VC and angel investors are typically among the most important owners in entrepreneurial firms, ranked second behind entrepreneurs themselves (George et al., 2005). Both types of investors are value-adding investors or providers of “smart money” (Bruton et al., 2010; Mason and Harrison, 1996; Sapienza et al., 1996). This implies they extensively monitor the progress of their portfolio firms and contribute value-adding services in addition to merely providing financial resources. As such, the presence of VC and angel investors may influence an entrepreneur’s discretion over slack resources in a number of ways.

First, entrepreneurs are limited in the number of opportunities they can perceive or create (Shane, 2000; Shane and Venkataraman, 2000), which explains a decreasing value for each additional amount of slack (Nohria and Gulati, 1997). VC and angel investors, however, often spend a considerable amount of time contributing value-adding activities to portfolio firms. Gorman and Sahlman (1989), for instance, showed that VC investors who sit on the board devote on average 80 hours of on-site time and 30 hours of phone time per year in direct contact with each of their portfolio firms. Angel investors are known to be even more actively involved in their portfolio firms compared to VC investors (Van Osnabrugge, 2000). Further, VC and angel investors often bring a network of ties with potential suppliers, customers, financiers and other critical stakeholders (Hochberg et al., 2007; Prowse, 1998). They provide entrepreneurs with a range of contacts that are typically unavailable when entrepreneurs proceed on their own (Maurer and Ebers, 2006; Prowse, 1998). In addition, VC and angel investors possess knowledge on the market, industry and competitors of their portfolio firms, while entrepreneurs are often described as lacking a broader view on their markets (Fiet, 1995; Maula et al., 2005). As a consequence of these value-adding activities, entrepreneurs obtain access to new information, which significantly affects their ability to discover new, value-creating opportunities (Shane and Venkataraman, 2000). By enabling entrepreneurs to consider these opportunities that they would otherwise not have been aware of, VC and angel investors increase entrepreneurial discretion (Thompson, 1967). Slack resources exactly benefit firm performance by
providing entrepreneurs with the means to pursue new opportunities. Thus, VC and angel investors are expected to amplify slack resources’ beneficial effect on firm performance by broadening entrepreneurs’ range of valuable opportunities to pursue.

Second, both VC and angel investors will generally advocate running firms in the most efficient way possible (Berkus, 2006; Chemmanur et al., 2011). Not only will they try to avoid the wasteful use of their investments, they will also push entrepreneurs’ limits to make them stretch their resources as much as possible. Board and voting rights provide VC and angel investors with the power to enforce such entrepreneurial behavior by, for example, requiring investor ratification before key strategic decisions can be executed (Cumming, 2008). Additionally, contracting and active monitoring should form an important deterrent against overoptimistic behavior on the entrepreneur’s part. To this end, investors can again rely on board and voting rights, which often include rights to dismiss or replace the top management team (Parhankangas and Landström, 2006). Developing a more personal relationship with entrepreneurs may be another way to avoid overoptimistic and complacent behavior (Fiet, 1995). Forbes (2005) indeed shows that entrepreneurs whose firms have attracted VC are less overconfident than entrepreneurs whose firms have not. As such, VC and angel investors should decrease entrepreneurs’ deviant discretion and limit the costs of slack resources related to lax discipline. Thus,

**Hypothesis 1:** The impact of (a) financial slack and (b) human resource slack on firm performance is more positive in VC-backed firms compared to their peers without such investors.

**Hypothesis 2:** The impact of (a) financial slack and (b) human resource slack on firm performance is more positive in angel-backed firms compared to their peers without such investors.
Differences between and among VC and Angel Investors, their Influence on Entrepreneurial Discretion, and the Performance Consequences of Slack Resources

All stakeholders in a firm will have tolerance for some actions and intolerance for others (Hambrick and Finkelstein, 1987). Because many entrepreneurial actions will almost always lie outside the “zone of acceptance” of some stakeholder, discretion theory indicates that scholars should focus on those stakeholders whose withdrawal or resistance to entrepreneurial actions would pose a serious setback to entrepreneurs (Hambrick and Finkelstein, 1987). For entrepreneurial firms, VC and angel investors, as blockholders, are often portrayed as qualifying this condition. Blockholders are assumed to have both the incentives and influence to affect managerial discretion (Dalton et al., 2003). Nevertheless, treating private investors as a monolithic group of blockholders ignores some important differences between and among these investors (e.g., Bruton et al., 2010). To get more insight into the incentives and influence of VC and angel investors to shape entrepreneurs’ discretion, we focus on differences between these investors and on the role of their ownership stakes.

VC versus Angel Investors. So far, we have argued that both VC and angel investors will increase the value and decrease the costs of slack, without explicitly hypothesizing differences between both types of investors to do so. Despite their similarities, however, VC and angel investors also have their differences. Specifically, VC investors are professional investors that use institutional money to invest (Sapienza, 1992). Angel investors are individuals who often have entrepreneurial experience and use their personal funds to invest (Mason and Harrison, 1996). Due to differences in operation modes between these two types of investors, we argue that VC investors will be better able than angels to influence entrepreneurs’ discretion over slack resources, thereby more strongly enhancing slack’s value while curtailing its costs.

First, VC investors invest in a larger portfolio of firms than angels among whom those with three or more investments are a minority (Van Osnabrugge, 1998). This is important because individuals are better able to assimilate and exploit knowledge when they have previously
accumulated experience within related knowledge domains (Cohen and Levinthal, 1990; De Clercq and Dimov, 2008). While angel investors often tend to invest in industries in which they have gained some experience, the limited empirical research that is available suggests they have less industry experience than VC investors (Van Osnabrugge, 2000). Additionally, within a VC firm one can draw on the expertise and experience of multiple investment managers, whereas angels mainly have to rely on themselves to provide valuable advice and information. Taken together, this suggests that VC investors may have a broader knowledge base than angels to draw from, enabling them to bring more opportunities to the entrepreneur’s attention and to offer them a broader perspective. As such, they should be better able to increase the value of a given level of slack resources than angel investors.

Second, VC investors tend to write extensive contracts by putting together specific shareholder agreements and stipulating differentiated shareholder rights (Cumming, 2008). Angel investors, however, rely more on relational governance than contractual governance (Fiet, 1995). This implies that angel contracts are generally more entrepreneur-friendly, have weaker control rights, use less contractual provisions and are used more from a transactional than a control point of view (Goldfarb et al., 2007). Prowse (1998), for instance, argues that a large proportion of the angel community is unsophisticated in terms of ensuring adequate protection in the investment contracts they write. Consequently, VC investors are expected to decrease the cost of slack and lax discipline by more so than angel investors as they can rely on more professional and complete contracts to force entrepreneurs not to invest in projects guided by overconfidence, to work more efficiently and to avoid complacent behavior. Thus,

*Hypothesis 3*: The impact of (a) financial slack and (b) human resource slack on firm performance is more positive when firms are backed by VC compared to angel investors.
VC and Angel Investors’ Incentives through Ownership. The notion of VC and angel investors influencing entrepreneurial discretion is rooted in these investors’ involvement in their portfolio companies. Discretion theory indicates that to qualify as a constraint to the entrepreneur’s discretion, investors who perceive a certain action as being outside of their “zone of acceptance” must not only be powerful, but must also be able to react relatively immediately to the action itself (Hambrick and Finkelstein, 1987). The latter is unlikely when investors are not sufficiently involved in portfolio firms.

Providing extensive value-adding services and monitoring entrepreneurial actions, however, are costly activities to investors (Manigart et al., 2002). Hence, without the proper incentives investors may not be sufficiently motivated to be actively involved in their portfolio companies and thus to influence entrepreneurial discretion. An important determinant of investors’ incentive to expend effort on portfolio firms is their ownership stake (Brush et al., 2000; Zahra, 1996). A high ownership stake should make investors more motivated and committed to provide information and advice to entrepreneurs and to monitor their actions. When investors hold a low ownership percentage, however, they may be less willing to bear the costs of being actively involved and will likely be insufficiently incentivized to do so (Brush et al., 2000). Being more incentivized to provide value-adding services, investors with a high ownership stake should increase the discretionary set of entrepreneurs by more so than if they had a low ownership stake. Moreover, when investors have a high ownership stake, they also have more incentives to closely monitor entrepreneurs, thereby limiting entrepreneurs’ ability to become lax when pursuing new projects (Zahra, 1995). Together, private investors with high ownership stakes are expected to enhance the performance consequences of slack resources by more so than private investors with low ownership stakes as they allow entrepreneurs to pursue more valuable opportunities with a given set of slack resources, while reducing their ability to pursue lax investments.
We expect this line of reasoning to hold especially true for professional VC investors given that financial return maximization and cost efficiency is an absolute priority to them (Cumming et al., 2007). Without the necessary incentives, they will have an inclination to prefer to execute less rather than more costly activities, such as active post-investment involvement. Contrary to VC investors, angels conduct investments both for their return potential and for personal motives, such as fun and gaining prestige in the entrepreneurial community (Mason and Harrison, 2002). Angel investors are hence likely to be more generally incentivized and more active investors irrespective of their equity stakes (Van Osnabrugge, 2000). Thus, the impact of ownership stake on the relationship between slack and firm performance is likely to be negligible in angel-backed firms. Professional VC investors, on the other hand, are more likely to require a high ownership percentage to become more actively involved in their portfolio firms. Taken together, this leads us to hypothesize:

**Hypothesis 4:** The impact of (a) financial slack and (b) human resource slack on firm performance is more positive in VC-backed firms when VC investors have a high ownership stake as compared to a low ownership stake.

**Hypothesis 5:** The impact of (a) financial slack and (b) human resource slack on firm performance is more positive when VC investors have a high ownership stake as compared to when angel investors have a high ownership stake.

**METHODS**

**Sample and Data Sources**

We use a sample of 1,215 Belgian firms. Given our research interest, we constructed a sample of firms that raised VC or angel financing and similar firms that did not raise such financing. The Belgian research setting provides us with two advantages. First, we had access to databases from professional associations and networks which allowed us to construct a sample comprising both
formal VC and angel investments. Studies comprising both VC and angel investments are rare (Bruton et al., 2010). Second, all Belgian firms (with limited liabilities of shareholders) are required to file financial statements with the Belgian Central bank. As such, we have detailed information on all VC- and angel-backed firms and were able to construct a sample of similar firms which did not raise such financing. Again, the detailed data we have available on entrepreneurial firms is rare (Brav, 2009).

We identified 120 firms backed by formal VC investors by using a database provided by the Belgian Venture Capital and Private Equity Association (BVA). The BVA was founded in 1986 and is the professional association that represents the Belgian VC and private equity community. The BVA provided us a random sample of one third of all initial VC investments conducted by its members between 1994 and 2004. It includes seed and startup investments and the provision of growth capital, but excludes buy-outs. We also identified 90 firms backed by informal VC investors that received initial angel financing between 1994 and 2004. For this purpose we used multiple data sources, including deal lists from Business Angel Networks, data from the Global Entrepreneurship Monitor and directories of high-technology firms. Additionally, for each VC- and angel-backed firm, we searched for information on their ownership structure by collecting legally required statements on capital increases that are published in the Belgian Law Gazette.

For each VC- and angel-backed firm, we selected up to five comparable firms which did not raise such financing. For this purpose, we used a database comprising all financial accounts of Belgian firms. Our matching procedure is similar to that used by Puri and Zarutskie (2012). We first selected firms with the same age, defined as the number of years since legal incorporation because the accumulation of slack resources and the effectiveness by which firms deploy slack is age dependent (George, 2005). Within the group of firms founded in the same year, we selected firms operating in the same industry based on 4-digit industry codes (or 3-digit codes whenever 4-digit codes were unavailable). This is important because the industry environment influences the value of slack
(Bradley et al., 2011a; George, 2005). Finally, within the group of firms founded in the same year and operating in the same industry environment, we selected firms with a similar size because slack is size dependent (George, 2005). Unreported statistics confirm that our samples of VC-backed firms and their peers and angel-backed firms and their peers respectively do not differ significantly from each other in terms of age, industry and size distribution (these unreported statistics and insights from other matching procedures are available upon request).

**Dependent Variable**

We operationalize performance as gross profit, defined as the difference between sales and the cost of goods produced (as in George, 2005). This measure is scaled by total assets to make it comparable for firms with a different size and to reduce heteroskedasticity concerns (Brav, 2009). We do not use performance measures based on net income because variability in the tax treatment of income in private firms undermines the reliability of such performance estimates (George, 2005). Gross profit on total assets is measured three years after investment (or equivalent year for the firms which do not raise VC or angel financing) to help establish the direction of causality (Bradley et al., 2011b). It should also allow for sufficient time for entrepreneurs to transform slack into usable resources and address new opportunities or threats, which will subsequently influence performance. Additionally, prior research suggests that most value added by VC investors is created in the first years after initial investment (Bertoni et al., 2011) and that exits start to emerge from three years after the investment (Puri and Zarutskie, 2012). As such, we believe three years represents a valid time frame for our study.  

**Independent Variables**

*Financial slack.* We measure financial slack as the amount of cash and cash equivalents scaled by total assets (Kim et al., 2008; Voss et al., 2008) in the year of investment for VC- or angel-backed
firms and equivalent year for their peers. This measure is adjusted for industry norms by subtracting the median ratio of cash and cash equivalents to total assets for all firms in the same three-digit NACE industry as the focal firm (Bromiley, 1991; George, 2005). Thus, financial slack represents a close estimate of excess cash resources held by firms compared to industry norms.

*Human resource slack.* We define human resource slack as employment cost relative to total assets in the year of VC or angel investment and equivalent year for firms which do not raise such financing. This measure is adjusted for industry norms by subtracting the median ratio of employment cost on total assets for all firms in the same three-digit NACE industry as the focal firm. Larger values indicate greater levels of human resource slack. Our measure is similar to previous studies which defined human resource slack as the number of employees relative to sales adjusted for industry norms (Mellahi and Wilkinson, 2010; Mishina et al., 2004; Voss et al., 2008). However, it differs in two regards; (1) we use employment cost instead of the number of employees, and (2) we scale employment cost by total assets rather than sales.

We use employment cost rather than the number of employees because the former forms an integral part of the profit and loss account, while the latter is only reported in a supplementary social balance sheet. The drawback of using the number of employees is that our sample size decreases due to missing data. Fortunately, the available data indicates that employment cost on total assets and number of employees on total assets are highly correlated (0.76; p < 0.001). We hence use employment cost as a proxy for the number of employees in a firm. Moreover, employment cost not only captures the quantity, but also the quality of employees. Employees with more human capital (higher education and more experience) will be more costly to employ. However, individuals with more human capital are likely to be more effective and efficient in performing a particular task (Becker, 1964). Hence, by using employment cost rather than the number of employees we take into account that not all employees contribute the same amount of human capital.
We scale employment cost by total assets rather than using sales for two reasons. First, VC investors are known to invest in high-growth, high-potential firms without immediate sales prospects, even in low-tech industries (Puri and Zarutskie, 2012). With zero sales we would have been unable to calculate human resource slack at the time of investment for some VC-backed firms. Second, only large Belgian firms are required to report their sales figures. Using sales would thus lead to a bias in that we would only be able to calculate human resource slack for these larger firms.

**VC (angel) Dummy.** We construct a VC (angel) dummy variable which equals one when firms raise financing from a VC (angel) investor and zero for their peers without such financing. Prior research indicates that the mere presence of VC (angel) investors as shareholders may influence the operations of their portfolio firms (e.g., Ehrlich et al., 1994; Puri and Zarutskie, 2012). Further, we calculate the interaction between the slack measures and VC (angel) dummy to study whether the relationship between slack and performance is moderated by the presence of VC (angel) investors.

**High ownership percentage.** We make a distinction between VC or angel investors with a high versus low ownership stake in their portfolio firms. To this end, we create a dummy variable which equals one for investors with ownership stakes starting at 25% and zero otherwise. We focus on the lead investor because this investor typically plays the most important role in the governance of the investment and provision of value-adding services (Wright and Lockett, 2003). Further, we use a dummy variable rather than a continuous ownership variable because it is better aligned with our theoretical arguments. Specifically, investors (and especially VC investors) may require a sizable part of the ownership to be sufficiently incentivized to bear the costs of being actively involved in their portfolio firms (Brush et al., 2000). Moreover, the 25% threshold reflects an important blocking minority, hence allowing investors to control a firm’s strategic agenda and to influence its strategic choices (Zahra, 1995). The 25% threshold is important in Belgian legislation because as of this threshold shareholders are able to block important corporate decisions, including decisions regarding
capital increases, mergers and acquisitions. We also calculate interactions between the high ownership percentage dummy and our slack variables.

**Control Variables**

We control for firm, industry and year effects. With regard to firm effects, we control for firm age, firm size, patents and other forms of slack. Firm age is measured as the years since formal incorporation at the year of investment or equivalent year for matched firms. Firm size is measured as the natural logarithm of property, plant, and equipment at investment or equivalent year for matched firms. We also control for the knowledge intensity of firms by including the natural logarithm of the cumulative number of patents applied for (plus one) up to investment or equivalent year for matched firms. We further control for the effect of other forms of slack. Potential slack is measured as the debt-to-equity ratio adjusted for industry norms at investment or equivalent year for matched firms (George, 2005). Recoverable slack is measured as the sum of accounts receivables and inventory on total assets adjusted for industry norms (Bradley et al., 2011a) and is also measured at investment or equivalent year for matched firms.

There exists non-randomness in the probability that firms raise VC or angel financing (Cosh et al., 2009). Specifically, entrepreneurs search for (or eschew) certain outside investors and/or outside investors seek out certain types of firms. If studies fail to control for such selection issues regressions may produce biased results (Cosh et al., 2009). To address this possibility, we include an Inverse Mills Ratio or selection correction as a control. Following prior research (Cosh et al., 2009), we employed the Heckman procedure. First, we develop selection models predicting the receipt of VC or angel financing respectively using insights from previous research on financing decisions in entrepreneurial firms (Cosh et al., 2009; Vanacker and Manigart, 2010). Specifically, cash flow to total assets, intangible assets to total assets, the natural logarithm of the number of patents applied for (plus one), tangible assets to total assets, overdue short term priority debt on total assets, debt-to-
equity ratio, interest coverage ratio and the natural logarithm of firm size were used in the selection models. The ratio of intangible assets to total assets, for instance, is described as a good proxy for growth potential (Villalonga, 2004) and is related to the probability of raising outside equity finance (Vanacker and Manigart, 2010). The number of patents applied for is another variable on which especially VC investors are likely to select (Hsu and Ziedonis, 2008). Second, a correction is made for selection by incorporating the Inverse Mills Ratio obtained from the selection models into the regression models of interest.  

With regard to industry effects, we control for industry profitability measured as the natural logarithm of median gross profit based on all firms in the same three-digit NACE industry as the focal firms. High industry profitability is not only likely to influence the performance level of the focal firms, but may also indicate opportunities to generate slack (George, 2005). We further included industry dummy variables to capture broader industry-level effects: manufacturing, construction, wholesale and retail trade, information and communication technologies (ICT), biotechnology, business services and other. We used ICT as the reference industry.

Finally, we include dummy variables for the years in which firms received financing from VC or angel investors and the years in which their peers entered our dataset. These variables help to control for the effects of any general economic event or trend.

RESULTS

Descriptive statistics

Table I provides an overview of the means, standard deviations and correlations between the variables used in the empirical models. Panel A focuses on the sample of VC-backed firms and their peers without such investors, while Panel B focuses on the sample of angel-backed firms and their peers without such investors. We note that both for VC-backed firms and their peers and angel-backed firms and their peers correlations between financial and human resource slack are low and...
insignificant. This indicates that firms with financial slack do not necessarily have human resource slack or vice versa.

***INSERT TABLE I ABOUT HERE***

**Hypothesis tests**

Table II gives the results of the OLS regressions using the sample of VC-backed firms and their peers, and angel-backed firms and their peers respectively. Model 1 and 2 are the baseline models without interactions. In Model 3, we focus on VC-backed firms and their peers and add interactions between the VC dummy and our slack measures. This model is used to test Hypothesis 1. In Model 4, we focus on angel-backed firms and their peers and add interactions between the angel dummy and our slack measures. This model is used to test Hypothesis 2. Variance inflation factors (VIFs) in all models are well below 10 and hence do not indicate that multicollinearity may be unduly influencing our results (Kutner et al., 2005).

***INSERT TABLE II ABOUT HERE***

Hypothesis 1 stated that the impact of (a) financial slack and (b) human resource slack on performance would be more positive in VC-backed firms compared to their non-VC-backed peers. The moderating effect of VC on the financial slack-performance relationship is significant and positive in the main effects interaction from Model 3 (β = 0.057; p < 0.10). As illustrated in Figure 1, the relationship between financial slack and performance is more positive in VC-backed firms than in non-VC-backed firms. With regard to human resource slack, although the VC-human resource slack interaction is not significant, the interaction between the VC dummy and the squared term of human resource slack is positive and significant (β = 0.038; p < 0.05). Figure 2 shows that an increase in human resource slack increases performance in a linear fashion in non-VC-backed firms, but in an
exponential fashion in VC-backed firms. Hence, a given increase in human resource slack results in a stronger increase in performance for VC-backed firms. Overall, we find support for Hypothesis 1a and 1b.

***INSERT FIGURE 1 AND FIGURE 2 ABOUT HERE***

Hypothesis 2 stated that the impact of (a) financial slack and (b) human resource slack on performance would be more positive in angel-backed firms than in their non-angel-backed peers. Model 4 shows that the presence of angel investors does not influence the relationship between financial slack and firm performance, but it does alter the relationship between human resource slack and performance. Specifically, the angel dummy and human resource slack interaction is positive and significant ($\beta = 0.042; \ p < 0.05$). As illustrated in Figure 3, an increase in human resource slack is more positive for performance in angel-backed firms compared to non-angel-backed firms. Thus, while we fail to find support for Hypothesis 2a, we do find support for Hypothesis 2b.

***INSERT FIGURE 3 ABOUT HERE***

Hypothesis 3 stated that the impact of (a) financial slack and (b) human resource slack on performance would be more positive when firms are backed by VC investors as compared to angel investors. While qualitative comparisons of the coefficients between Model 3 and Model 4 are instructive, they do not provide a formal statistical test for our hypothesis. We use seemingly unrelated estimation (Suest) to formally test for differences in the size of the coefficients across regression models (Wade et al., 2006). We find no statistical difference for the moderating role of VC investors versus angel investors on the relationship between financial slack and firm performance. Our results show that the interaction effect between the VC dummy and human resource slack squared in Model 3 is significantly greater as compared to the interaction between the angel dummy
and human resource slack squared in Model 4 (p < 0.10). Thus, we find no support for Hypothesis 3a and weak support for Hypothesis 3b.

Table III reports the OLS regressions on the sample of only VC-backed firms and angel-backed firms respectively. VIFs indicated that multicollinearity was a concern for our slack measures and their interaction with the high ownership dummy variable. We therefore employed the “orthog” command in Stata to generate orthogonalized measures. This technique “partials out” the common variance, creating transformed variables that are uncorrelated with one another (Bradley et al., 2011a; Pollock and Rindova, 2003). Although this procedure makes direct interpretation of coefficients more difficult, it still allows for evaluation of the strength and direction of relationships (Pollock and Rindova, 2003). After this procedure, all VIFs were well below the critical threshold, indicating that multicollinearity is no longer a concern in the reported models. Models 5 and 6 are baseline models, which only include main effects. In Model 7 and 8, we add the interaction effects to study the moderating impact of a high ownership percentage on the relationship between slack and performance.

Hypothesis 4 stated that in VC-backed firms the impact of (a) financial slack and (b) human resource slack on performance would be more positive when investors have a high ownership percentage. Based on the sample of VC-backed firms only, model 7 shows that the product term between financial slack and the high ownership dummy variable is positive and significant (β = 0.068; p < 0.01). Figure 4 shows that the relationship between financial slack and performance is more positive in VC-backed firms when the lead investor has a high ownership stake. Further, we find that the moderating effect of high VC ownership stake on the human resource slack-performance relationship is significant and positive in the main effects interaction from model 7 (β = 0.089; p < 0.01), while marginally significant and positive for the squared human resource slack-high ownership stake interaction term (β = 0.050; p < 0.10). As Figure 5 illustrates, the relationship between human
resource slack and firm performance is significantly steeper in firms backed by a VC investor with a high ownership stake. Overall, we find strong supporting evidence for Hypotheses 4a and 4b.

***INSERT FIGURE 4 AND FIGURE 5 ABOUT HERE***

Hypothesis 5 stated that the impact of (a) financial slack and (b) human resource slack on performance would be more positive when VC investors have a high ownership stake as compared to when angel investors have a high ownership stake. We indeed fail to find an impact of high ownership stakes on the relationship between slack and performance in the sample of angel-backed firms (Model 8). Nevertheless, as argued above, qualitative comparisons of the coefficients between Model 7 and Model 8 do not provide a formal test of our hypothesis. We use seemingly unrelated estimation (Suest) to formally test for differences in the size of the coefficients across regression models. Our results show that the interaction between financial slack and a high VC ownership percentage in Model 7 is significantly greater as compared to the interaction between financial slack and a high angel ownership percentage in Model 8 (p < 0.05). In addition, the interaction between human resource slack and a high VC ownership percentage in Model 7 is significantly greater as compared to the interaction between human resource slack and a high angel ownership percentage in Model 8 (p < 0.01). This provides strong supporting evidence for Hypothesis 5a and 5b.

DISCUSSION AND CONCLUSION

In this study, we considered how powerful external stakeholders influence the relationship between slack resources and firm performance. We find that the presence of VC and angel investors positively moderates the slack-performance relationship. Additionally, this moderating effect is conditioned by the type of investor under consideration (i.e. VC versus angel) and investor ownership stake (i.e. high
versus low). Our study contributes to the management and entrepreneurship literatures in multiple ways.

First, we add to the slack literature by further unpacking the black box between slack resources and firm performance. Specifically, our findings underscore the importance of considering outside investors in debates regarding the value of resource slack in private firms given that these investors are likely to influence the discretion by which entrepreneurs can use their slack resources, which subsequently affects the performance consequences of these resources. To illustrate the value of investors for the slack-performance relationship, consider the following numbers. VC-backed firms showed a 1.40 times increase in performance from minus one to plus one standard deviation of financial slack compared to a 1.03 times increase for their peers without such investors. An increase from minus one to plus one standard deviation of human resource slack benefits the performance of VC-backed firms more than the performance of similar firms without such investors (2.22 versus 2.20 times increase), where the benefit is especially important for VC-backed firms when human resource slack moves beyond the mean level (see Figure 2). An increase from minus one to plus one standard deviation in human resource slack had a greater impact on firm performance for angel-backed firms compared to their peers without such investors (2.50 versus 1.75 times increase) (see Figure 3).

We also contribute to the slack literature by focusing on both financial and human resource slack, whereas prior studies largely focused on the former (e.g., George, 2005; Bradley et al., 2011b). This is important as we note some differences in the performance consequences of these two types of slack. Unreported results (using the full sample of private firms) show that the linear effect of human resource slack on performance is more positive than that of financial slack ($p < 0.001$). We fail to find a difference with regard to quadratic effects. This entails that an increase in human resource slack has a more positive effect on firm performance compared to financial slack. An important avenue for future research is to increase our understanding why different types of resource slack have a different impact on firm performance. Additionally, it raises some concerns regarding measures that combine
financial and human resource slack (e.g., Nohria and Gulati, 1996) as such scales may mask key differences between different types of slack.

Second, we extend the managerial discretion literature by exploring the idea that powerful parties may enhance or restrict discretion. Most discretion research has focused on the internal discretion of managers but has largely ignored the ideas that (1) discretion may be distributed across organizational boundaries, with powerful actors that are not managers of the firm and (2) that these powerful outside actors may also serve to enhance rather than just restrict managerial discretion, both of which we support with our study.

Third, our study contributes to governance and slack research by examining the role of investor type and ownership stake in the slack-performance relationship. As for the former, we find only weak evidence that VC investors are better than angel investors at pushing entrepreneurs to extract more value out of a given set of human resource slack and no evidence that they are better at extracting value out of financial slack. These weak results may be explained by the huge heterogeneity among these investor groups. Specifically, whereas we argued that VC investors on average have a broader knowledge base to draw from, we must acknowledge that this assumes both VC and angel investors to be rather homogeneous groups of investors with regard to their relevant experience. However, previous research has indicated that substantial variation exists among both groups with regard to their experience related to industries they invest in and to making investments as such (e.g., De Clercq and Dimov, 2008; Dimov and De Clercq, 2006; Wiltbank, 2005). Moreover, we know these differences in experience matter; for instance, angel investors tend to achieve higher returns whenever they do invest in areas they have expertise in (Wiltbank and Boeker, 2007). A highly experienced angel investor may hence serve an entrepreneur equally well as a highly experienced VC investor when it comes to helping them to see opportunities they would otherwise not have seen. Getting a clear picture on how VC and angel investors may differentially affect the slack-performance relationship may thus require a more detailed measurement of our hypothesized
underlying mechanisms (e.g., their knowledge base), thereby allowing researchers to take into account the significant heterogeneity that exists among both groups of investors.

Another fruitful avenue for future research would be to measure the type of assistance provided by these investors. This may allow us to answer the question of why VC investors are marginally better than angel investors at helping entrepreneurs creating value out of their human resources, but not out of their financial resources (see Table II). A possible explanation may be found in some of the early research on differences between VC and angel investors. Ehrlich et al. (1994) for instance suggested that angel investors are less likely to change the make-up of their portfolio companies’ management teams and are less likely to provide assistance regarding staffing issues (whereas entrepreneurs do rely on both types of investors to provide assistance in financial issues). The difference may hence not so much be in the level of value-adding provided by VC and angel investors, but rather in the type of value-adding provided.

Despite the weak results related to differences between VC and angel investors with regard to their influence on the slack-performance relationship as such, we do find an important difference when we take into account ownership stakes. Specifically, results suggest that especially professional VC investors act as a source of resource value creation when they have high ownership stakes in their portfolio firms (Figure 4 and Figure 5). Having a high ownership stake resulted in a 1.78 times increase in firm performance from minus one to plus one standard deviation in financial slack for VC-backed firms while having a low ownership stake resulted in a 1.42 times increase in firm performance from minus one to plus one standard deviation in financial slack. For human resource slack, an increase from minus one to plus one standard deviation had a greater impact on firm performance for firms backed by VC investors with a high ownership stake (3.04 times increase) compared to those with a low ownership stake (2.38 times increase). We fail to find an impact of angel ownership on the relationship between slack resources and firm performance. These results tie into a significant stream of governance research which has focused on the relationship between
ownership and firm performance. Our findings show that for VC investors high ownership stakes matter, but not so for angel investors. Together these findings thus reveal more complex links between investor type, ownership concentration and the performance consequences of slack resources in private firms. The typical assumption in extant governance research that outside blockholders of equity are by definition incentivized and able to monitor their investments is hence unwarranted.

Finally, our study contributes to the entrepreneurial finance literature. While research on the value-adding or coaching role of VC investors is rather elaborate (e.g., Sapienza, 1992; Sapienza et al., 1996), few studies have demonstrated the processes by which VC investors increase firm performance. We argue that VC investors, through their value-adding and monitoring roles, help entrepreneurial firms to allocate their slack resources in a way that increases firm performance. This is especially the case for VC investors when they have a high ownership stake in their portfolio firms. Second, we not only focus on VC investors, but also on angel investors. While there is an extensive literature on VC financing, the literature on angel financing is more limited. This is unfortunate as the angel investment market is expected to be multiple times larger than the venture capital market (Mason and Harrison, 1996). Although our study shows similarities between VC and angel investors, it also points towards differences between these private investors as sources of resource value creation.

Our paper also has several practical implications. First, entrepreneurs may learn about the optimal level of financial and human resources in their firms. Further, one of the main incentives for entrepreneurs to search for VC or angel financing is a need for financial resources to support their high-growth ambitions. Our findings, however, show that these investors do not necessarily provide their portfolio firms with more slack resources, but that these investors do help entrepreneurs to make the most out of the resources at hand. Second, results are interesting for VC and angel investors as well. Our findings demonstrate that both investor types are able to (at least partially) reduce the negative consequences of holding too much slack. VC and angel investors typically have the difficult
task of deciding how many resources they will contribute to their portfolio firms without stimulating entrepreneurs to become less creative or pursue dubious investments. Our study demonstrates that especially in VC-backed firms, where these investors have a large ownership stake, the performance consequences of having a buffer of financial resources is largely positive. VC investors should hence be careful not to provide their portfolio firms with too little resources (for instance by using excessive staged financing) in an effort to reduce potential agency problems.

Conclusion

Previous research on the performance consequences of slack resources in private firms ignored a critical reality: many entrepreneurs do not “go it alone” when pursuing their ambitions but rather obtain support from outside investors, such as VC and angel investors. In this study, we have explored how different ownership contexts influence the performance consequences of slack resources in private firms. We argued that VC and angel investors influence entrepreneurs’ discretion over their slack resources, which is expected to influence the performance consequences of these resources. Specifically, we argued and showed that both VC and angel investors increase the value (decrease the cost) of slack resources. VC investors with a high ownership stake are especially instrumental as a source of resource value creation. Our study points to complex links between different types of outside investors, slack resources, and the performance of private firms.

ACKNOWLEDGEMENTS

We thank three anonymous JMS reviewers, Donald Bergh (the editor), Dan Forbes, Mirjam Knockaert, Ian MacMillan and James Thompson among others, for their helpful feedback. This paper further benefited from seminars at The Sol C. Snider Entrepreneurial Research Center (The Wharton School), Eindhoven University of Technology, Université Catholique de Louvain and Maastricht
NOTES

1. We thank an anonymous reviewer for drawing our attention to this contribution.

2. Scholars have also used agency theory as a framework to explain the negative performance consequences of slack resources (e.g., Nohria and Gulati, 1997). Several scholars, however, have argued that agency issues are minimized in private firms because entrepreneurs are typically the most important owners (George, 2005). This is even the case for private firms that raise outside equity finance. Moreover, private investors use several mechanisms to minimize potential agency issues (Gompers, 1995). Although agency arguments with respect to the misuse of slack may not hold for the type of firms we study, the core assumption of a possible negative relationship between slack and firm performance remains valid (Mellahi and Wilkinson, 2010). Indeed, while there is no apparent concern regarding the objectives of entrepreneurs, they may still have discretion to take actions that lie outside the “zone of acceptance” of investors and invest in dubious projects. Entrepreneurs, for instance, may take actions with the intent to create value, but which are driven by overconfidence. This demonstrates an important distinction between “latitude of objectives” and “latitude of actions” (Hambrick and Finkelstein, 1987), where our study is mainly concerned with the latter.

3. All Belgian firms are required to report gross profit, irrespective of their size. Small firms, however, only need to provide gross profit and not the individual components (including sales and cost of goods produced). Also note that our results are robust for alternative time lags in measuring firm performance (two and four years).

4. Obviously, one can never rule out selection issues entirely and other selection issues may exist. For instance, the “best” entrepreneurial firms may match with the “best” investors. To address this possibility, we added controls reflecting VC investor quality (such as VC age and a dummy for the oldest, most
established Belgian VC investor) in our regression models including VC-backed firms. Results did not change. Unfortunately, we do not have such data for angel investors.

REFERENCES


### Table I
Descriptive statistics and correlation matrix

#### Panel A: VC-backed firms and their peers (n=631)

<table>
<thead>
<tr>
<th>Variable</th>
<th>VC-backed firms</th>
<th>Peer group</th>
<th>Correlations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>S.D.</td>
<td>Mean</td>
</tr>
<tr>
<td>1 Firm age</td>
<td>6.23</td>
<td>8.65</td>
<td>6.25</td>
</tr>
<tr>
<td>2 Firm size</td>
<td>4.37</td>
<td>2.59</td>
<td>3.95</td>
</tr>
<tr>
<td>3 Patents</td>
<td>0.10</td>
<td>0.44</td>
<td>0.01</td>
</tr>
<tr>
<td>4 Potential slack</td>
<td>2.85</td>
<td>9.76</td>
<td>4.80</td>
</tr>
<tr>
<td>5 Absorbed slack</td>
<td>-0.20</td>
<td>0.26</td>
<td>-0.07</td>
</tr>
<tr>
<td>6 Industry profitability</td>
<td>5.93</td>
<td>0.58</td>
<td>5.92</td>
</tr>
<tr>
<td>7 VC dummy</td>
<td>1.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>8 High ownership %</td>
<td>0.52</td>
<td>0.50</td>
<td>N.A.</td>
</tr>
<tr>
<td>9 Financial slack</td>
<td>0.12</td>
<td>0.24</td>
<td>0.08</td>
</tr>
<tr>
<td>10 Human resource slack</td>
<td>-0.11</td>
<td>0.25</td>
<td>-0.09</td>
</tr>
<tr>
<td>11 Profitability</td>
<td>0.34</td>
<td>0.34</td>
<td>0.40</td>
</tr>
</tbody>
</table>

#### Panel B: Angel-backed firms and their peers (n=446)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Angel-backed firms</th>
<th>Peer group</th>
<th>Correlations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>S.D.</td>
<td>Mean</td>
</tr>
<tr>
<td>1 Firm age</td>
<td>3.76</td>
<td>5.33</td>
<td>3.97</td>
</tr>
<tr>
<td>2 Firm size</td>
<td>3.64</td>
<td>1.87</td>
<td>3.56</td>
</tr>
<tr>
<td>3 Patents</td>
<td>0.02</td>
<td>0.13</td>
<td>0.02</td>
</tr>
<tr>
<td>4 Potential slack</td>
<td>6.28</td>
<td>12.99</td>
<td>4.52</td>
</tr>
<tr>
<td>5 Absorbed slack</td>
<td>-0.08</td>
<td>0.30</td>
<td>-0.08</td>
</tr>
<tr>
<td>6 Industry profitability</td>
<td>5.96</td>
<td>0.61</td>
<td>5.95</td>
</tr>
<tr>
<td>7 Angel dummy</td>
<td>1.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>8 High ownership %</td>
<td>0.58</td>
<td>0.50</td>
<td>N.A.</td>
</tr>
<tr>
<td>9 Financial slack</td>
<td>0.10</td>
<td>0.23</td>
<td>0.09</td>
</tr>
<tr>
<td>10 Human resource slack</td>
<td>-0.08</td>
<td>0.29</td>
<td>-0.10</td>
</tr>
<tr>
<td>11 Profitability</td>
<td>0.39</td>
<td>0.39</td>
<td>0.39</td>
</tr>
</tbody>
</table>

Correlations significant at p < 0.05 are in bold. Variables 7 and 8 are binary thus their correlations should be interpreted with care.
Table II
The performance consequences of slack resources in VC-backed firms, angel-backed firms and their respective peers

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
<th>Diff. Model 3 vs. 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>VC-backed firms and peer group</td>
<td>Angel-backed firms and peer group</td>
<td>VC-backed firms and peer group</td>
<td>Angel-backed firms and peer group</td>
<td></td>
</tr>
<tr>
<td>Firm age</td>
<td>0.001 (0.002)</td>
<td>0.001 (0.003)</td>
<td>0.001 (0.002)</td>
<td>0.001 (0.003)</td>
<td></td>
</tr>
<tr>
<td>Firm size</td>
<td>0.015 * (0.006)</td>
<td>0.023 * (0.010)</td>
<td>0.015 * (0.007)</td>
<td>0.021 * (0.010)</td>
<td></td>
</tr>
</tbody>
</table>
| Patents          | 0.022 (0.052)    | -0.099 * (0.040) | 0.036 (0.054)    | -0.100 ** (0.038)*** p < 0.001 (in the regression models, one-tailed tests are used for hypothesized effects, two-tailed tests for control variables).
| Potential slack  | 0.007 † (0.004)  | -0.003 † (0.002) | 0.007 † (0.004)  | -0.004 * (0.002)  |
| Potential slack squared | 0.000 † (0.000) | 0.000 † (0.000) | 0.000 † (0.000) | 0.000 † (0.000) |
| Recoverable slack | 0.198 *** (0.055) | 0.275 ** (0.081) | 0.180 ** (0.055) | 0.245 ** (0.082) |
| Recoverable slack squared | -0.374 ** (0.132) | -0.229 (0.163) | -0.400 ** (0.130) | -0.256 (0.162) |
| Industry profitability | -0.067 * (0.026) | -0.016 (0.026) | -0.065 * (0.026) | -0.024 (0.026) |
| Inverse Mills Ratio | 0.134 *** (0.038) | 0.046 (0.040) | 0.143 *** (0.038) | 0.031 (0.041) *|
| Financial slack  | 0.027 (0.031)    | 0.073 ** (0.027) | 0.005 (0.036)    | 0.061 * (0.027)  |
| Financial slack squared | -0.024 (0.028) | -0.063 * (0.028) | -0.008 (0.033) | -0.051 † (0.030) |
| Human resource slack | 0.164 *** (0.016) | 0.104 *** (0.017) | 0.164 *** (0.017) | 0.087 ** (0.019) **|
| Human resource slack squared | -0.003 (0.018) | -0.060 ** (0.019) | -0.015 (0.019) | -0.056 * (0.021) |
| Venture capital (VC) dummy | 0.027 (0.031) | -0.041 (0.047) | 0.035 (0.065) |
| Angel dummy      |                  | -0.041 (0.047)    |                  |                  |
| Financial slack x VC (angel) dummy |                  | 0.057 † (0.036) | 0.038 (0.050) | -0.046 (0.036) |
| Financial slack squared x VC (angel) dummy |                  | -0.046 (0.036) | -0.053 (0.048) | -0.046 (0.036) |
| Human resource slack x VC (angel) dummy |                  | 0.005 (0.017) | 0.042 * (0.021) | 0.005 (0.017) |
| Human resource slack squared x VC (angel) dummy |                  | 0.038 * (0.019) | -0.019 (0.027) † | 0.038 * (0.019) |
| Constant         | 0.657 *** (0.183) | 0.532 ** (0.178) | 0.635 *** (0.182) | 0.585 *** (0.177) |
| F-statistic      | 9.320            | 4.84             | 8.470            | 4.520            |
| Prob.            | 0.000            | 0.000            | 0.000            | 0.000            |
| R-squared        | 0.284            | 0.206            | 0.326            | 0.272            |
| N                | 631              | 446              | 631              | 446              |

* Industry and year controls are included but not reported. Unstandardized coefficients are reported; standard errors adjusted for heteroskedasticity are in parentheses. † 0.10; * p < 0.05; ** p < 0.01 and *** p < 0.001 (in the regression models, one-tailed tests are used for hypothesized effects, two-tailed tests for control variables).
Table III
Slack resources, performance and the ownership stake of VC investors and angel investors

<table>
<thead>
<tr>
<th></th>
<th>Model 5 Only VC-backed firms</th>
<th>Model 6 Only angel-backed firms</th>
<th>Model 7 Only VC-backed firms</th>
<th>Model 8 Only angel-backed firms</th>
<th>Diff. Model 7 vs. 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firm age</td>
<td>0.001 (0.004)</td>
<td>-0.003 (0.008)</td>
<td>-0.001 (0.003)</td>
<td>-0.001 (0.008)</td>
<td></td>
</tr>
<tr>
<td>Firm size</td>
<td>0.050 *** (0.012)</td>
<td>0.012 * (0.037)</td>
<td>0.047 *** (0.011)</td>
<td>-0.008 (0.035)</td>
<td></td>
</tr>
<tr>
<td>Patents</td>
<td>0.122 (0.084)</td>
<td>-0.755 * (0.315)</td>
<td>0.178 * (0.079)</td>
<td>-0.686 * (0.310)</td>
<td></td>
</tr>
<tr>
<td>Potential slack</td>
<td>-0.001 (0.006)</td>
<td>-0.009 (0.006)</td>
<td>0.002 (0.006)</td>
<td>-0.007 (0.007)</td>
<td></td>
</tr>
<tr>
<td>Potential slack squared</td>
<td>0.000 (0.000)</td>
<td>0.000 (0.000)</td>
<td>0.000 (0.000)</td>
<td>0.000 (0.000)</td>
<td></td>
</tr>
<tr>
<td>Recoverable slack</td>
<td>0.525 ** (0.169)</td>
<td>0.313 (0.264)</td>
<td>0.586 ** (0.168)</td>
<td>0.216 (0.230)</td>
<td></td>
</tr>
<tr>
<td>Recoverable slack squared</td>
<td>0.471 (0.315)</td>
<td>-0.228 (0.397)</td>
<td>0.366 (0.265)</td>
<td>-0.137 (0.414)</td>
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<td>Industry profitability</td>
<td>-0.033 (0.064)</td>
<td>-0.062 (0.084)</td>
<td>-0.080 (0.063)</td>
<td>-0.047 (0.078)</td>
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<tr>
<td>Inverse Mills Ratio</td>
<td>0.295 ** (0.092)</td>
<td>0.469 * (0.205)</td>
<td>0.301 ** (0.088)</td>
<td>0.410 * (0.200)</td>
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<tr>
<td>Financial slack</td>
<td>0.054 † (0.031)</td>
<td>0.022 (0.076)</td>
<td>0.064 * (0.028)</td>
<td>0.008 (0.076)</td>
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<tr>
<td>Financial slack squared</td>
<td>-0.048 † (0.027)</td>
<td>-0.071 (0.067)</td>
<td>-0.020 (0.026)</td>
<td>-0.065 (0.060)</td>
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<td>Human resource slack</td>
<td>0.180 ** (0.053)</td>
<td>0.122 (0.076)</td>
<td>0.201 *** (0.040)</td>
<td>0.156 † (0.081)</td>
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<tr>
<td>Human resource slack squared</td>
<td>0.074 † (0.042)</td>
<td>-0.013 (0.053)</td>
<td>0.073 * (0.036)</td>
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<tr>
<td>High ownership %</td>
<td>0.044 (0.033)</td>
<td>-0.051 (0.054)</td>
<td>0.043 (0.028)</td>
<td>-0.053 (0.051)</td>
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<tr>
<td>Financial slack x High ownership %</td>
<td>0.068 ** (0.028)</td>
<td>-0.078 (0.058)</td>
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<tr>
<td>Financial slack squared x High ownership %</td>
<td>0.034 (0.030)</td>
<td>0.074 (0.061)</td>
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<tr>
<td>Human resource slack x High ownership %</td>
<td>0.089 ** (0.030)</td>
<td>-0.065 (0.043)</td>
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<tr>
<td>Human resource slack squared x High ownership %</td>
<td>0.050 † (0.031)</td>
<td>-0.032 (0.050)</td>
<td>-0.032 (0.050)</td>
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<tr>
<td>Constant</td>
<td>0.178 (0.499)</td>
<td>0.173 (0.653)</td>
<td>0.528 (0.466)</td>
<td>0.205 (0.652)</td>
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<table>
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<td>1.440</td>
<td>0.151</td>
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* Industry and year controls are included but not reported. Unstandardized coefficients are reported; standard errors adjusted for heteroskedasticity are in parentheses. † 0.10; * p < 0.05; ** p < 0.01 and *** p < 0.001 (in the regression models, one-tailed tests are used for hypothesized effects, two-tailed tests for control variables).
Figure 1. Moderating effect of VC investors on the relationship between financial slack and firm performance

Figure 2. Moderating effect of VC investors on the relationship between human resource slack and firm performance
Figure 3. Moderating effect of angel investors on the relationship between human resource slack and firm performance
Figure 4. Moderating effect of VC ownership percentage on the relationship between financial slack and firm performance for VC-backed firms

Figure 5. Moderating effect of VC ownership on the relationship between human resource slack and firm performance for VC-backed firms