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Slack Resources and the Performance of Privately Held Firms

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SLACK RESOURCES AND THE PERFORMANCE OF PRIVATELY HELD FIRMS

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Empirical findings from publicly traded firms and behavioral arguments suggest a positive influence of resource slack on financial performance. While this area has remained unexplored in privately held firms, conceptual arguments indicate that resource constraints may enhance performance. Longitudinal data on 900 privately held firms confirm the differing influences of forms of slack on performance. Results indicate that a combination of behavioral and resource constraints arguments are necessary to explain the slack-performance relationship in privately held firms. The implications of these findings for theories of resources and entrepreneurship are discussed.

Organizations are continually challenged to foster growth and improve performance while enduring strong exogenous pressures and endogenous constraints. Management scholars have offered strategic and behavioral explanations of factors that induce or impel organizations to compete and excel in these evolving competitive landscapes. An emergent dialog within this paradigm is the role of resources and their influence on managers' aspirations. Resources act as inducements to experiment, take risks, and make proactive strategic choices. Resources are also deployed to build capabilities that make firms competitive, maintain coalitions that ensure the convergence of personal and organizational goals, and act as buffers in periods of economic duress. Given this critical role, the presence or absence of excess resources and their impact on performance carries substantive implications for scholarship in organizational theory and the practice of management.

Slack is potentially utilizable resources that can be diverted or redeployed for the achievement of organizational goals. These resources vary in type (e.g., social or financial capital) and form (e.g., discretionary or nondiscretionary). Studies have used financial slack in different forms as a predictor of risk taking (Wiseman & Bromiley, 1996), innovation (Nohria & Gulati, 1996), and performance (Bromiley, 1991; Tan & Peng, 2003). Some researchers have noted that explanations for the influence of different forms of slack on performance do not articulate a priori arguments but tend to present post hoc rationalizations (Deephouse & Wiseman, 2000; Greve, 2003). Additionally, studies have focused on publicly traded firms and have largely ignored privately held firms, leaving a gap in scholars' understanding of how financial slack may influence performance in these firms. Privately held firms tend to be undercapitalized (Holtz-Eakin, Joulfaian, & Rosen, 1994a, 1994b) and the mechanisms by which slack influences performance may vary, as managers of privately held firms differ in their decision-making process from their counterparts in public firms (Busenitz & Barney, 1997). In this article, I articulate differing relationships between the forms of financial slack and the performance of privately held firms.

Two theoretical streams help explain the role of slack in privately held firms: research on the behavioral theory of the firm (Cyert & March, 1963; March, 1994), and the resource constraints literature (Baker & Nelson, 2005; Mosakowski, 2002). Behavioral theory treats firms as coalitions of actors, and its proponents argue that slack provides opportunities for managers to appease their political coalitions by allowing parties to pursue their own agendas (Cyert & March, 1963). Researchers have amplified this concept by arguing that slack relaxes internal controls and creates funds that can be redirected toward projects with uncertain outcomes, fostering an environment for innovation. Along these lines, evidence indicates a positive effect of slack on the innovation and performance

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of public firms (Bromiley, 1991; Damanpour, 1987; Greve, 2003).

Alternatively, according to studies that can collectively be termed the resource constraints literature, firms with fewer resources are likely to leverage them more efficiently (Baker & Nelson, 2005; Starr & Macmillan, 1990). The claim is that resource constraints alter the behavior by which resources are garnered and expended, forcing managers to improve allocative efficiency. While the resource constraints literature has tended to focus on entrepreneurial firms, I believe that the theoretical assumptions of resource constraints, private ownership, and private ownership's implications for managerial behavior are similar for entrepreneurial and privately held firms. Most entrepreneurial firms are privately held, but entrepreneurial firms typically have higher growth rates than other private firms. For example, studies using privately held firms and entrepreneurial firm samples concur that resources are sparse in both types of firms and elicit "bootstrapping" modes of managerial responses (Baker, Pricer, & Nenide, 2000; Holtz-Eakin et al., 1994a, 1994b). Similarly, entrepreneurial new ventures and privately held firms exhibit comparable managerial responses to resource utilization, as ownership structures in these firms are homogeneous and foster risk taking (George, Zahra, & Wiklund, 2005). Accordingly, I develop arguments using both behavioral theory and the resource constraints literature.

Some studies have used economic arguments to articulate the influence of slack on firm performance (e.g., Deephouse & Wiseman, 2000). Popular among them are agency theory, according to which the interests of firms' owners (principals) and managers (agents) may diverge (Jensen & Meckling, 1976), and X-efficiency theory, according to which firms are necessarily inefficient in the allocation of resources (Leibenstein, 1980). Agency theory may not be as applicable in privately held firms as in large public firms because in private firms, principals and agents are more likely to be the same individuals (Fama & Jensen, 1983). Though there are recent conceptual arguments that some agency relationships may exist in family-owned private businesses, empirical validation is limited. Therefore, I build my arguments using organizational theories on slack. In some instances, I reconcile these arguments with X-efficiency theory.

Scholars have articulated two critical influences on an organization's ability to utilize resources effectively, namely, age and environment (Stinchcombe, 1965; Thompson, 1967). Age is an important moderator of the effectiveness with which firms deploy resources. Some firms are created with substantial resource endowments, while others are disadvantaged at founding and are born out of scarcity. Young firms may be particularly vulnerable to the quantity of their resource endowments. Excess resources permit investments in developing capabilities to overcome the liabilities of newness in start-ups, thereby increasing the probability of survival (Hannan, 1998). As firms evolve with age, they may require resources to renew capabilities or build new competencies, whereas other established firms may have fewer resource demands. Therefore, studying the impact of age provides insights into the effectiveness with which young and old firms deploy their slack resources to improve performance.

Slack resources allow firms to adapt to complex competitive landscapes (Levinthal, 1997), thereby impacting firm performance. Industry complexity refers to the competition in an industry that stems from concentration, or the market share dominance of one or more firms (Dess & Beard, 1984). The presence of adequate or excess resource endowments provides the flexibility for a firm to decide on a course of action when trying to adapt to its environment (Thompson, 1967). Slack resources also help buffer firms from environmental shocks and influence the enactment of strategies. Firms may adapt to industry complexity by reconfiguring their resource endowments to form new capabilities or by shifting resources into or away from their existing markets. Firms with larger slack resource endowments are more likely to have freedom in their responses to competitor strategies, thereby influencing performance. This study extends existing literature by capturing the influence of age and industry complexity as moderators of the slack-performance relationship.

The significance of this research is threefold. The impact of resource deployment on the achievement of organizational goals is fundamental to theories of how organizations act, evolve, and perform. A major contribution of this study is to distinguish among forms of slack and to articulate the pattern of their relationships with performance. Second, it is the first longitudinal study of slack in privately held firms. Even though there are more than 25 million such firms, generating over 70 percent of U.S. employment (Small Business Administration [SBA], 2003), previous studies of slack have not focused on the relevance and patterns of slack in privately held firms. There are substantial difficulties with collecting reliable data for privately held firms. Their owners tend to be more reluctant to share financial and other information than the managers of publicly traded firms, creating barriers that could explain the low number of large-sample

longitudinal studies. Given a void in behavioral explanations of privately held firm actions, some authors have called for a systematic investigation of this topic (Baum, Locke, & Smith, 2001). Finally, I examine the effects of age and environment on the slack-performance relationship. Investigating the nexus of organizational and environmental influences on the accumulation and deployment of slack resources strengthens the contributions of this study to management theory and practice.

THEORY DEVELOPMENT

Slack is used to stabilize a firm's operations by absorbing excess resources during periods of growth and by allowing firms to maintain their aspirations and internal commitments during periods of distress (Cyert & March, 1963; Levinthal & March, 1981; Meyer, 1982). Slack provides that cushion of actual or potential resources that allows an organization to adapt successfully to internal pressures for change in policy as well as to initiate changes in strategy (Bourgeois, 1981). Through this dual internal and external role, slack influences performance.

Only three conceptual studies have articulated a rationale for the existence of forms of slack (Bourgeois, 1981; Bourgeois & Singh, 1983; Sharfman, Wolf, Chase, & Tansik, 1988). These studies have forwarded classifications of slack based on *managerial discretion* in the deployment of resources. Sharfman and colleagues suggested that slack resources are anchored along a continuum of managerial discretion, wherein "low-discretion slack" provides less flexibility to managers and their strategic options. These authors noted that absorbed slack, or excess costs in specialized assets, is low discretion, while unabsorbed slack is high discretion. Though the discretionary dimension is continuous, these authors argued that low- and high-discretion slack coexist and often are employed together, implying nonexclusivity in forms of slack resources. Examples of high-discretion financial resources are cash and receivables, and low-discretion resources may include debt, fixed assets, and excess capacity. It is important to recognize that both low- and high-discretion slack resources offer implicit benchmarks for managers of their own firm's resources as compared to their competitors'. This comparison of absolute levels of resources may motivate managers' strategic actions and competitive behaviors.

In privately held firms, the allocation and utilization of resources are likely to dominate managerial decisions. Using the personal tax returns of private business owners, Holtz-Eakin and coauthors (1994a) found that when extra resources were introduced through windfall gains such as inheritance, these businesses tended to have higher survival rates and to disclose earnings increases of up to 20 percent in subsequent years. These authors attributed this increase in earnings to productive investments, in capital equipment, for example, suggesting that private firms are undercapitalized and resource infusion enhances performance. Although researchers have found that in public firms, low- and high-discretion resources vary in their impacts on performance, it is unlikely that similar relationships hold in privately held firms. Tan and Peng (2003) noted that organizational theory was useful to explain a positive relationship between high-discretion slack and performance, while agency theory could better explain the negative performance impact of low-discretion slack. These authors argued that managers of public firms tended to exhibit agency problems when low-discretion slack was available, perhaps by implementing excessive diversification. However, as agency issues are minimized in privately held firms because owners tend to be managers as well, divergence in the effects of high- and low-discretion resources is unlikely. Therefore, I expect both low- and high-discretion slack to be positively related to performance, as the presence of slack implies that these firms are adequately capitalized rather than undercapitalized.

Behavioral arguments suggest that slack enhances experimentation and risk taking, which influence the innovativeness (Nohria & Gulati, 1996) and performance (Bromiley, 1991; Singh, 1986) of large firms. Therefore, I see two reasons for the positive effect of both high- and low-discretion slack on the performance of privately held firms. First, slack eases capital restrictions and improves the strategic choices of managers for investments with positive performance implications. Second, it allows experimentation and risk taking, which may also have positive performance consequences.

However, performance declines are likely to be seen at higher levels of slack. Slack may insulate a firm from exogenous shocks (Thompson, 1967), engendering managerial complacency or irrational optimism. Firms with large resource reserves might be less impelled to undertake initiatives through experimentation, which may decrease performance because new entrepreneurial opportunities are not exploited. Another possibility is that managers may become overly optimistic and implement inappropriate strategic actions (Cooper, Dunkelberg, & Woo, 1988; de Meza and Southey, 1996) that decrease performance (Bateman & Zeithaml, 1989). Private managers may be susceptible to biases in

decision making such as the planning fallacy (Kahneman & Lovallo, 1994) and escalation of commitment (Ross & Staw, 1993). The planning fallacy consists of overconfidence about the duration and viability of projects, and escalation of commitment involves defending and continuing a course of action in spite of negative outcomes. Both biases are likely to occur at high levels of slack. If managers perceive that their absolute levels of both high- and low-discretion slack far exceed those of competitors, they are likely to be more optimistic about courses of action and may inadvertently implement strategic actions that decrease performance. Therefore,

Hypothesis 1a. In privately held firms, financial performance will increase and then decrease with increases in high-discretion slack.

Hypothesis 1b. In privately held firms, financial performance will increase and then decrease with increases in low-discretion slack.

Dynamism in the generation and deployment of slack resources is important to the evolution of managerial behavior and firm strategy (Greve, 2003; Levinthal & March, 1981). Prior studies have focused on "absolute" levels of slack rather than slack "relative to demand." Although organizations' aspiration levels change with a concomitant need to generate slack (March, 1994), researchers have not explored the implications of resource demand on the slack-performance relationship. Even though this availability-demand concept has been theorized (Bourgeois & Singh, 1983; Sharfman et al., 1988), the tendency in empirical analyses has been to emphasize the excess resources of a firm relative to its industry or comparison group, rather than excess resources relative to the focal firm's operational demands.

Here, I introduce *transient slack,* defining it as excess resources available after resource demands for operations have been met. The concept of transient slack emphasizes the ephemeral nature of slack, whereas both high- and low-discretion slack capture absolute levels (as compared to peer firms' resources). This distinction is theoretically meaningful and important for two reasons. First, transient slack separates resource availability from the resource demands placed on a system. By doing so, it emphasizes the temporal patterns of an organization's resource generation and deployment profiles, as the goals and the needs of an organization evolve in a dynamic competitive landscape. Second, one can uniquely identify the performance effects of resource availability and resource demand using transient slack. That is, firms facing high demands but having few resources, like many growth-oriented firms, may enact materially different strategies from firms with greater resource availability but lower demands. This comparison of availability and demand is pertinent to studying privately held firms as well as new ventures where entrepreneurs cobble together resources to satisfy needs (Baker & Nelson, 2005). Therefore, I develop arguments for transient slack, as it provides valuable and relevant insights into the impact of resources on performance, especially in entrepreneurial firms.

Behavioral theory and resource constraints arguments appear to diverge with regard to predictions for transient slack. Behavioral arguments suggest that resource demand and its availability are intertwined. That is, slack not only reflects absolute levels across peer firms but also is relative to internal needs such as maintaining coalitions (Cyert & March, 1963; March, 1994). Both the absolute and relative levels of slack influence managerial choice, engendering experimentation and risk taking that have positive performance consequences. Here, behavioral arguments lead to a positive relationship between transient slack and performance.

However, the literature on resource constraints suggests that firms with fewer resources than their operational demands require are likely to be more efficient as they find ways to leverage and stretch their available resources. Supporting the resource constraints argument, some authors have hypothesized that firms bootstrap their limited resources to achieve goals (Levi-Strauss, 1966; Starr & MacMillan, 1990). In a cross-sectional sample of 177 privately held firms, Baker, Pricer, and Nenide (2000) found that undercapitalized firms "outperformed" those with excess capital. These authors inferred that resource constraints bridled the optimism of managers. Economic arguments of X-efficiency (Leibenstein, 1980) are also consistent with the resource constraints literature. Leibenstein suggested that firms are inefficient in the deployment of resources. Therefore, if demands for resources exceed their availability, firms are likely to be more efficient in the deployment of resources to enhance performance.

My view is that behavioral arguments and resource constraints arguments are not necessarily incongruent but operate at different slack levels. When transient slack is negative (demand substantially exceeds availability), privately held firms may bootstrap and find more efficient and effective uses for limited capital. However, at higher levels of transient slack (availability substantially exceeds demand), firms may begin to experiment and become proactive in their strategic choices. At zero or marginally positive levels of transient slack (avail-

ability equals demand), the incentives to experiment or bootstrap are minimal. Combining these arguments, I expect a curvilinear relationship in which performance is high when transient slack is substantially positive or substantially negative but in which performance is low when transient slack is near zero. Given that transient slack is a function of resource availability and demand, I hypothesize separate relationships:

Hypothesis 2a. In privately held firms, resource availability will be related in a curvilinear manner with financial performance. Specifically, performance will decrease and then increase with increases in resource availability.

Hypothesis 2b. In privately held firms, resource demand will be related in a curvilinear manner with financial performance. Specifically, performance will increase and then decrease with increases in resource demand.

The Influence of Age

A unique moderator of the slack-performance relationship is likely to be the age of a firm. Younger firms may behave differently in evolving landscapes than older, more established firms. Slack is also time-dependent in both its accumulation and its deployment (Cyert & March, 1963; Sharfman et al., 1988; Thompson, 1967). Accordingly, age and slack levels are likely to be positively related. Behavioral arguments suggest that as firms grow older, the number of their internal political coalitions also increases. Managers anticipate and deploy slack as a means to appease these coalitions. For example, managers induce experimentation and risk taking by funding multiple projects that have profit potential and by searching for alternative competencies (Levinthal & March, 1981; March, 1994). By increasing experimentation, these older firms are likely to enjoy higher performance than younger firms that possess fewer resources with which they can experiment.

Scholars have suggested that resources assume greater importance in young firms (e.g., Stinchcombe, 1965). Some have argued that substantial resource endowments at a younger age may provide for greater investments in capability development, enhancing a firm's prospects for survival (Hannan, 1998). However, young firms tend to be resource-constrained and to suffer from the "liability of newness," and they are thus less likely to have the experience to predict their resource needs. Therefore, young firms are likely to make less efficient use of resource slack than older firms. Sharfman and coauthors (1988) argued that older firms have had the opportunity to experiment with different types of resources and select the ones that best fit their demands. These firms, owing to their maturity, have more predictable needs and can better envision slack deployment to improve performance. In sum, older firms are more likely to possess large amounts of slack than younger firms and to be aware of their resource demands, conditions that help the older firms generate and deploy slack effectively. Therefore, I posit the following moderated effect:

Hypothesis 3. In privately held firms, the impact of slack on performance will be more positive in older firms than in younger firms.

The Influence of Industry Complexity

The competitive environment in which firms interact plays a critical role in their survival and performance (Levinthal, 1997). Publicly held and privately held firms compete in overlapping product-markets and may use similar distribution channels and suppliers. Therefore, it becomes critical for firms to adapt their strategies to their competitive environments. Industry complexity significantly influences the enactment of strategic responses. As noted above, industry complexity refers to the competition arising from high concentration of market share among a few dominant players (Dess & Beard, 1984). For example, large firms control the market and restrict smaller players' strategic choices, including pricing power, branding, and leverage in distribution and logistics. In complex industries, slack protects an organization from environmental pressures. By being insulated, the managers of privately held firms are not compelled to enact responses to the strategic moves of competitors that might decrease financial performance.

In complex environments, the managers of privately held firms are also likely to be constrained in their strategic choices. When slack is present, these managers perceive it as some guarantee of firm survival and execute "satisficing" rather than performance-maximizing strategies (March, 1994; Sharfman et al., 1988). Smith, Grimm, Gannon, and Chen (1991) found a negative relationship between slack and the probability of reacting to competitor actions: managerial responses were attenuated because of the buffer of extra resources. When slack is high, managers may deny that solutions exist and become rigid in their strategies (Staw, Sandelands, & Dutton, 1981), stances that negatively impact performance. This behavioral reasoning is consistent with economic arguments that firms are inefficient in their deployment of resources (Leibenstein,

TABLE 1
Descriptive Statistics and Correlations[a]

Variables[a]	Mean	s.d.	1	2	3	4	5	6	7	8	9	10	11	12
1. Firm size	16.54	2.21												
2. Industry profitability	0.06	0.04	−.02											
3. Number of competitors	185.10	98.50	.15	.12										
4. Size of competitors	3,787.50	2,622.00	.11	−.25	−.25									
5. Industry complexity	0.21	0.23	−.13	.23	−.67	−.09								
6. Number of plants	0.50	0.50	.60	.02	.19	.02	−.11							
7. Firm age	19.30	19.40	.31	−.03	−.12	.08	.00	.13						
8. Family management	0.32	0.46	−.30	.05	−.35	.11	.29	−.23	.07					
9. High-discretion slack[b, c]	41.10	305.30	.34	.00	.09	.02	−.05	.12	.21	−.09				
10. Low-discretion slack[d]	0.00	24.29	−.02	.00	−.00	−.00	.00	−.01	−.00	.02	−.03			
11. Resource availability[c]	−20.10	781.80	−.09	−.01	.01	−.03	.00	−.03	−.22	.02	−.40	.02		
12. Resource demand[c]	104.80	768.20	.37	−.01	.05	.04	−.05	.13	.27	−.08	.84	.01	−.61	
13. Performance[c]	147.08	707.70	.53	.01	.09	.03	−.07	.19	.39	−.12	.67	.01	−.27	.71

[a] Number of observations = 3,598. Correlations above .03 are significant at $p < .05$. Year and industry dummies are not reported.
[b] Cash.
[c] Millions of dollars.
[d] Debt-to-equity ratio.

1980), and an industry environment where profitability is low is likely to exacerbate this performance effect. Therefore, I posit a second moderated effect:

Hypothesis 4. In privately held firms, the impact of slack on performance becomes more negative in high-complexity industries than in low-complexity industries.

DATA AND MEASURES

A sample with diverse industry structures and competitive conditions was developed through selection of five technology-intensive industries (National Science Foundation, 2000) and five non-technology-intensive industries, and 43 subsectors; industry was defined at the three-digit SIC level, and subsector, at the four-digit level. The industries included were meat-packing products, textiles, paper and packaging, wood products, metal products, computers and equipment, pharmaceuticals, electronics, instrumentation, and telecommunications. By including multiple industries, the sample incorporates high variation in industry and firm growth rates (Dess & Beard, 1984), which may be material to the accumulation and deployment of slack. The data were drawn from the Dun & Bradstreet database and supplemented with data from *Ward's Business Directory of Privately Held Firms*. We selected a four-year window (1994–97) because slack may be accumulated and deployed over time. This window also maximized the number of firms reporting financial data for contiguous years, yielding a sample of 900 firms (3,598 observations).

We used financial ratios for calculating slack, as has been done in other studies (Bromiley, 1991; Deephouse & Wiseman, 2000; Singh, 1986). The use of financial ratios follows from arguments that financial data provide verifiable indicators of managerial behavior (Bourgeois, 1981; Tan & Peng, 2003). Though slack can exist in organizational capabilities and other assets, it is difficult to capture such slack in a longitudinal sample of private firms. While surveys might provide finer-grained measures, sampling and temporal variability would raise concerns of measurement error and validity. I calculated the financial measures of slack for each of the four years.

For *high-discretion slack,* I measured the level of cash reserves in a given year. Cash is the most easily deployed resource and provides managers the greatest degree of freedom in allocating it to alternate uses. For *low-discretion slack,* I measured the debt-to-equity ratio. In private firms, debt capacity is typically lower than in publicly traded firms because the private firms tend to be undercapitalized (i.e., have less equity in the business). With higher debt levels, the freedom to reallocate resources or raise additional debt to meet expedient needs becomes restricted. Private firms also tend to raise debt and invest these funds in fixed assets; debt thereby serves to temper managerial overconfidence (deMeza & Southey, 1996). The measures are consistent with those adopted in other studies of publicly traded firms (Bromiley, 1991; Deephouse & Wiseman, 2000).

For transient slack, I developed two measures to capture the ephemeral nature of slack. *Resource*

availability was the permanent capital of a firm (i.e., owner's equity plus debt) less fixed assets and other noncurrent assets. *Resource demand* was an estimate of cash required (five days worth of sales) plus accounts receivable and inventory less accounts payable. Though these measures are marginally complex, they have advantages over other measures used in previous research. First, measures such as the current ratio reflect short-term assets relative to short-term liabilities and do not accurately reflect a firm's resource requirements. Second, separating availability from demand helps to differentiate among patterns of resource deployment and allows testing if higher performance results from resource constraint—that is, demand is greater than availability. This measure is also used in financial software packages for loan default predictions (e.g., Fintel).

Given the variety in industry context in the sample, it is likely that slack also differs across industries. Since slack is operationally defined as excess absolute levels of resources (Nohria & Gulati, 1996), I calculated slack as the deviation from the mean of each of the 43 industry subsectors. This procedure provided a close estimate of excess resources compared to industry norms. The recalculated data were used for the analyses.

Firm age was years since incorporation. *Industry complexity* was Herfindahl's index of homogeneity in industry competition and concentration of resources, measured as the sum of the squared market shares of publicly traded firms in a sector (four-digit SIC). This index assumes a value of 0 to 1, where 0 reflects perfect competition among numerous incumbents with infinitesimal market shares. A high value represents large players and a disproportionate concentration of sales that restricts smaller firms' ability to enhance performance by limiting their strategic choices (Dess & Beard, 1984). High concentration is associated with high industry complexity.

Performance was gross profit, calculated as revenues less the cost of goods sold. Gross profit, a good indicator of profitability, was correlated with net income at .94 ($p < .0001$) and with net worth at .96 ($p < .0001$). We refrained from using net income or net worth because possible variability in the tax treatment of income in private firms might undermine the reliability of estimates of performance.

Control variables for year, industry, and firm effects were also used. For year effects, I dummy-coded each year as a categorical variable to help control for the performance effects of any general economic event or trend. For industry effects, I included five measures. *Industry profitability* was the average return on assets (ROA) of publicly traded firms operating in the same industry as a sample firm. A high ROA would suggest that the industry was profitable and had the potential to generate slack. *Number of competitors* was the number of public firms competing in the same industry as the sample firm, and *size of competitors* was the average number of employees of those public firms. Finally, I included *industry* dummy variables for each three-digit SIC code represented in the sample. Data for variables on publicly traded companies were drawn from Standard & Poor's COMPUSTAT.

The firm effects for which I controlled were firm size, number of plants, and type of management. Because slack is likely to be size dependent, controlling for size effects is important. Transformations such as the logarithmic value of slack variables are ineffective in controlling for size owing to attrition in sample size when the mean-centered slack variables are transformed. Also, dividing slack variables by assets would have confounded analyses here through common denominators in regression equations, leading to biased estimates. Therefore, an independent control for *firm size,* the logarithm of the value of sales in a given year, was used here. For *number of plants,* I included a categorical variable if a firm had multiple plant locations (single plant = 0). This measure partially controls for firm size, as larger firms are also likely to have multiple locations. Finally, a categorical variable for *family management* was included, coded 1 if a firm was categorized as family-owned by *Ward's Directory.*

METHODS AND RESULTS

Using ordinary least squares to estimate panel data can result in biased estimates because of unobserved heterogeneity. Although a random- or fixed-effects model can capture these relationships, such a model would not account for autocorrelation and heteroskedasticity (unequal error variance in the regression errors) in time series data. I adopted a cross-sectional time series feasible generalized least squares (FGLS) regression model because it provided reliable estimates in the presence of heteroskedasticity and autocorrelation (Wooldridge, 2002). Table 1 reports the descriptive statistics and correlations between the variables. The inclusion of slack variables and moderating effects increased model fit and explanatory power significantly; Table 2 gives the results of the FGLS regression analyses. The "log-likelihood" increased from –18,203.7 for the base model to –12,653.7 for the full model.

TABLE 2
Cross-Sectional Time-Series FGLS Estimates of Slack as a Predictor of Performance[a]

Variables	Model 1	Model 2	Model 3
Firm size	26.00*** (2.21)	3.45*** (0.62)	2.85*** (0.69)
Industry profitability	−18.85 (25.38)	−6.49 (6.92)	−7.92 (6.78)
Number of competitors	0.03 (0.02)	0.01 (0.01)	0.007 (0.01)
Size of competitors	−.0007 (0.001)	−.0003† (0.0001)	−0.0002 (0.0001)
Industry complexity	−2.31 (9.69)	0.13 (2.84)	0.72 (2.81)
Number of plants	−17.30** (5.96)	−3.03* (1.48)	−2.36 (1.58)
Firm age	1.23*** (0.24)	0.18** (0.06)	0.08 (0.06)
Family management	−4.39 (5.75)	1.55 (1.44)	1.04 (1.46)
High-discretion slack		0.92*** (0.04)	0.32** (0.11)
High-discretion slack squared		−.00001 (0.00001)	0.00007 (0.0001)
Low-discretion slack		0.07*** (0.02)	0.01 (0.01)
Low-discretion slack squared		−0.0003*** (0.0001)	−0.00006† (0.00003)
Resource availability		−0.15*** (0.01)	0.01 (0.02)
Resource availability squared		−.00001*** (.000003)	−0.000004 (0.000003)
Resource demand		1.22*** (0.03)	1.20*** (0.03)
Resource demand squared		−.0001*** (.000004)	−0.00006*** (0.00001)
High-discretion slack × firm age			0.01*** (0.001)
High-discretion slack × age			−0.000001* (0.000001)
High-discretion slack × complexity			−1.79* (0.73)
High-discretion slack squared × complexity			−0.0001 (0.001)
Low-discretion slack × age			
Low-discretion slack squared × age			
Low-discretion slack × complexity			
Low-discretion slack squared × complexity			
Resource availability × age			
Resource availability squared × age			
Resource availability × complexity			
Resource availability squared × complexity			
Resource demand × age			
Resource demand squared × age			
Resource demand × complexity			
Resource demand squared × complexity			
Constant	−412.30***	−56.71***	−45.13***
Log-likelihood	−18,203.70	−14,424.40	−14,133.60
Wald χ^2	161.17***	3,328.01***	2,596.70***
Incremental change (χ^2)		2,447.70***	102.83***

[a] Number of observations = 3,598; number of firms = 900. Year and industry controls are included but not reported. Unstandardized

† $p < .10$
* $p < .05$
** $p < .01$
*** $p < .001$

To check for robustness across different model specifications, I conducted a time series fixed-effects analysis, finding significant change in the amounts of variance explained (baseline model, $R^2 = .30$ [$F = 21.16$, $p < .0001$]; model with "main effects" added, $R^2 = .41$ [$F = 129.23$, $p < .0001$]; full model, including interaction effects, $R^2 = .56$ [$F = 184.20$, $p < .0001$]). Also, to check if the results were sensitive to firm size beyond the control variables used, I included the product terms of the slack variables and total firm assets as predictors. The pattern and significance of the results did not change, with the exception of low-discretion slack, where the squared term remained significant in the direction reported in Table 2, but the main effect became statistically insignificant. I also analyzed lagged ordinary least squares (OLS) and time series Arellano-Bond models with one- and two-year lags. When lagged models were included, the number of observations was reduced by half (data had to be available for four contiguous years). As heteroskedasticity (as determined by a Sargan test) was significant, the Arellano-Bond models required two-step estimators that did not provide reliable coefficient estimates. Since heteroskedasticity is a concern, I report the FGLS estimates controlling for heteroskedasticity and autocorrelation across panels using STATA statistical software.

TABLE 2
Continued

Model 4		Model 5		Model 6		Model 7	
3.34***	(0.61)	1.41***	(0.42)	2.04***	(0.59)	2.39***	(0.45)
−6.67	(6.91)	−6.09	(3.96)	−8.02	(6.65)	−20.74***	(4.14)
0.01†	(0.01)	0.003	(0.01)	0.01	(0.01)	0.003	(0.004)
0.0003†	(0.0001)	−0.0001	(0.0001)	−0.0002	(0.0001)	−0.0003***	(0.0001)
0.42	(2.81)	−0.40	(1.94)	3.85	(3.06)	0.91	(1.82)
−2.91*	(1.45)	−0.78	(0.98)	−1.15	(1.41)	−1.19	(1.03)
0.17**	(0.06)	0.06	(0.04)	0.15*	(0.06)	0.04	(0.03)
1.55	(1.42)	1.32	(0.90)	1.23	(1.40)	0.70	(0.83)
0.93***	(0.03)	0.43***	(0.04)	0.63***	(0.04)	−0.49***	(0.10)
−0.00001	(0.00001)	−0.00004**	(0.00001)	0.00001	(0.00001)	0.0002**	(0.0001)
0.07	(0.04)	0.02	(0.01)	0.04*	(0.02)	0.01	(0.02)
−0.0004**	(0.0001)	−0.0001***	(0.00003)	−0.0002***	(0.0001)	0.0001*	(0.0001)
−0.15***	(0.02)	0.08***	(0.02)	0.06	(0.04)	0.34***	(0.04)
−0.00001***	(0.00001)	0.0001***	(0.00001)	−0.00005*	(0.00002)	0.0001*	(0.00003)
1.22***	(0.03)	1.26***	(0.03)	1.35***	(0.04)	1.50***	(0.05)
−0.0001***	(0.000004)	−0.0001***	(0.00002)	−0.00005*	(0.00002)	−0.0002***	(0.00002)
						0.01***	(0.002)
						−0.000002*	(0.000001)
						2.50***	(0.66)
						−0.003**	(0.001)
−0.003	(0.003)					0.0001	(0.002)
0.00001	(0.00001)					−0.000009	(0.00001)
−0.02	(0.12)					−0.01	(0.08)
0.0003	(0.001)					−0.0001	(0.001)
		−0.002***	(0.001)			−0.004***	(0.01)
		−0.000001***	(0.0000001)			−0.000001***	(0.0000002)
				−0.94***	(0.27)	−0.77***	(0.26)
				0.0004*	(0.0002)	0.0001	(0.0001)
		0.002**	(0.001)			−0.0001	(0.001)
		0.000001***	(0.0000002)			0.000001***	(0.0000002)
				−0.95***	(0.29)	−1.58***	(0.28)
				−0.00005	(0.0002)	0.00009	(0.0002)
−55.33***		−22.96***		−35.45***		−35.57***	
−14,427.10		−13,052.10		−14,355.40		−12,653.70	
3,400.40***		4,239.60***		2,844.06***		7,870.50***	
2.39		104.73***		36.01***		419.38***	

coefficients are reported; standard errors are in parentheses.

As for the individual hypotheses, the nonlinear relationship between high-discretion slack and performance was not supported (Hypothesis 1a). The linear positive term was significant ($p < .001$), but not the squared term (model 2, Table 2). Hypothesis 1b, stating an increase and subsequent decrease in performance with increases in low-discretion slack, was supported ($p < .001$). Since transient slack was composed of resource availability and resource demand, testing their individual effects (rather than deriving a difference score measure) also allowed the parameter estimates to adjust independently rather than forcing the estimates to be equal. The curvilinear relationship between resource availability and performance was significant. Interestingly, both the linear and squared terms were negative and significant ($p < .001$), findings that were contrary to the hypothesized increase in performance at high levels of resource availability (Hypothesis 2a). Hypothesis 2b, which states that there will be a curvilinear relationship between resource demand and performance with a positive linear coefficient ($p < .001$) and a negative squared term, was supported ($p < .001$).

To test the interaction effects of Hypotheses 3 and 4, I included the product terms of age and complexity with the different forms of slack. Because I hypothesized curvilinear relationships for

FIGURE 1a
Moderating Effects of Age on the Relationship between High-Discretion Slack and Performance[a]

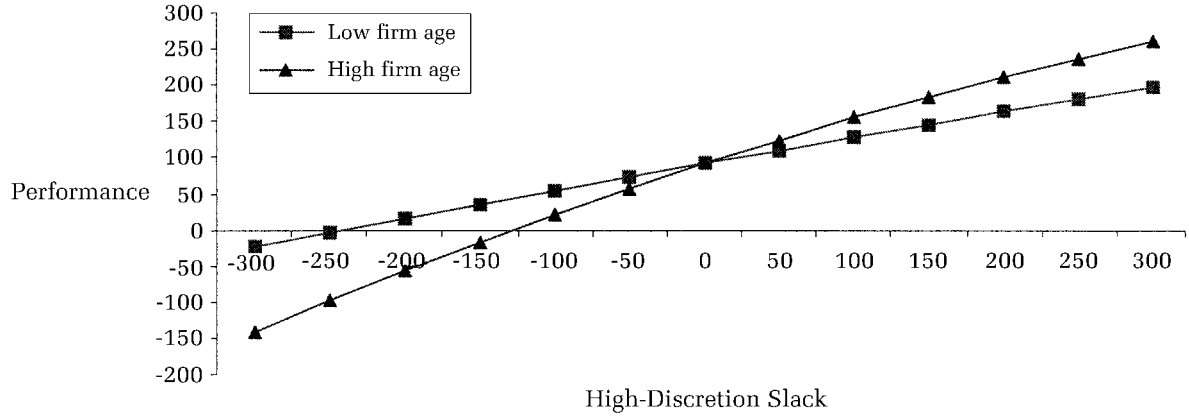
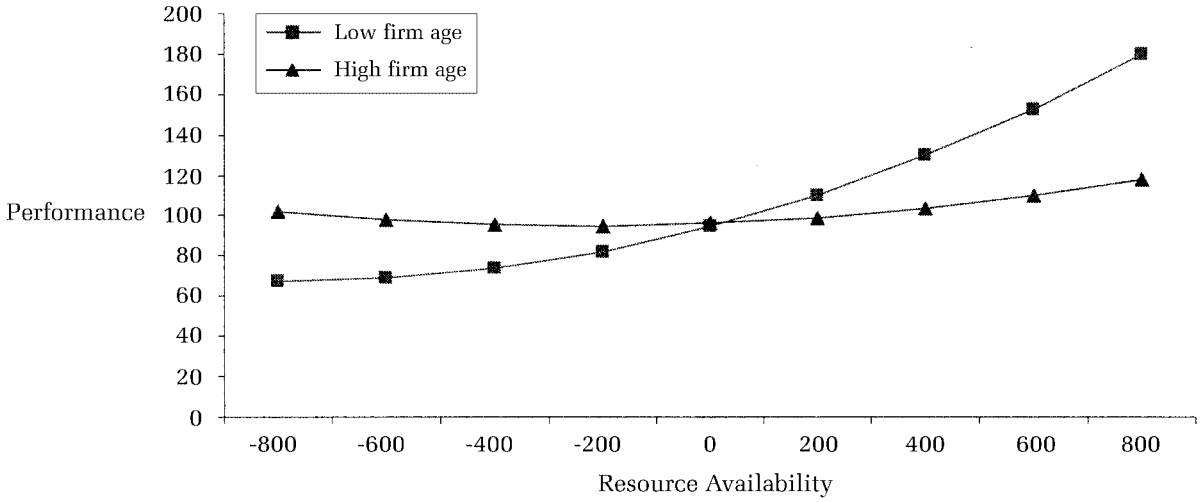


FIGURE 1b
Moderating Effects of Age on the Relationship between Resource Availability and Performance[a]



[a] Performance and slack were measured in millions of dollars.

the main effects, I included the product terms of moderators for the linear as well as the squared terms of the slack variables. By doing so, I was able to identify positive and negative concave relationships (Cohen & Cohen, 1983). The squared terms provide a more complete explanation by preventing misinterpretation of effects due to linearity and additivity in correlated variables (Cortina, 1993). The moderating effect of age on the slack-performance relationship (Hypothesis 3) was supported in both high-discretion (model 3) and transient slack measures (resource availability and resource demand, model 5) but not in low-discretion slack measures (model 4). As illustrated in Figure 1a, the relationship between high-discretion slack and performance is stronger (has a steeper positive slope) in older firms than in younger firms. The moderating effects of industry complexity on the slack-performance relationship (Hypothesis 4) were supported for both high-discretion and transient slack but not for low-discretion slack. As seen in Figures 2a–2c, the slack-performance relationship becomes negative (has a steeper negative slope) in more complex than in less complex industry environments. Unlike age, for which the squared product terms were significant, industry complexity had significant squared product terms only for resource availability, and not for the other forms of slack. The implications are discussed next.

DISCUSSION AND IMPLICATIONS

This study provides valuable insights into the accumulation and deployment of resources to

FIGURE 2a
Moderating Effects of Industry Complexity on the Relationship between High-Discretion Slack and Performance

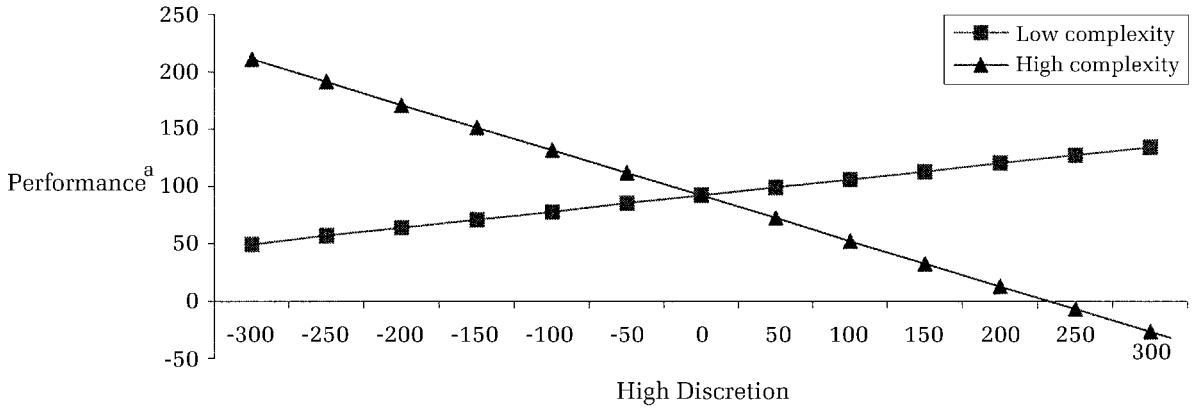
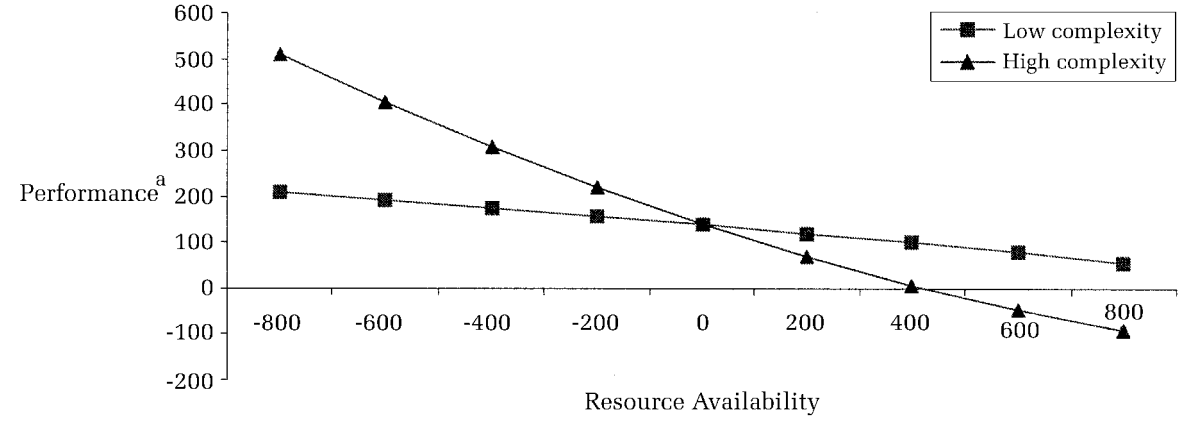


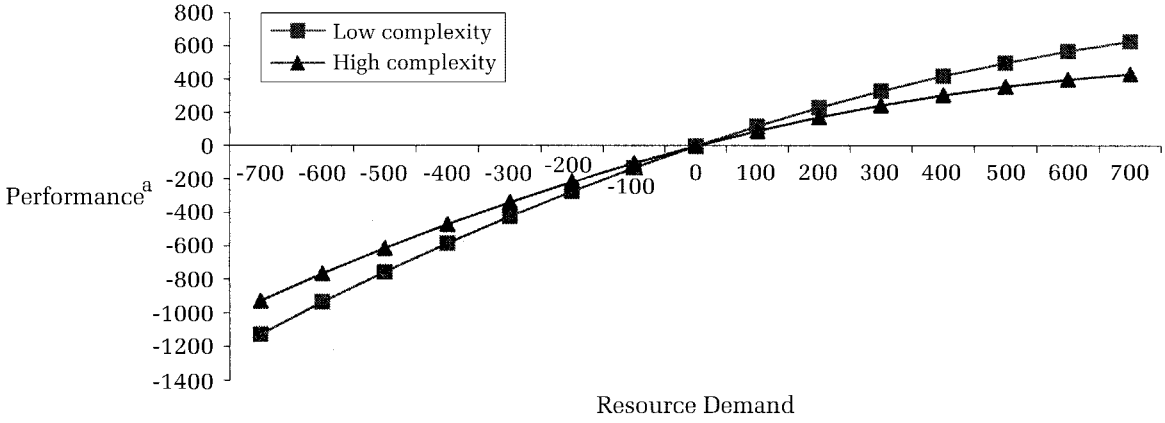
FIGURE 2b
Moderating Effects of Industry Complexity on the Relationship between Resource Availability and Performance



[a] Measured in millions of dollars.

achieve performance in privately held firms and enriches the ongoing dialog on the importance of resources. The study makes three important contributions to organizational theory. First, a major contribution is to develop causal logic for the influence of different forms of slack on firm performance. Though included in studies examining the relationship between risk and return, a rationale for the influence of slack has hitherto not been the focus of much theory building and empirical testing (Deephouse & Wiseman, 2000). Also within this domain, I have introduced the concept of transient slack, which captures slack availability relative to a focal firm's resource demands. Second, this is the first study to test and find support for the impact of resource constraints on the performance of privately held firms using longitudinal data. The finding that when resource demands exceed availability, performance is likely to be higher in privately held firms is meaningful and valuable for scholars, entrepreneurs, and managers of private firms. Third, this study explores the implications of age and industry complexity for the slack-performance relationship. The influence of age on slack informs the resource constraints and entrepreneurship literatures. Also, most studies have tested the implications of slack and environment for strategic choices (Meyer, 1982; Smith et al., 1991) but not for financial performance. By doing so, this study makes strong theoretical and empirical contributions by informing both the behavioral theory and the resource constraints literatures.

FIGURE 2c
Moderating Effects of Industry Complexity on the Relationship between Resource Demand and Performance



[a] Measured in millions of dollars.

Behavioral and Resource Constraints Roles in Entrepreneurship

Is more better? Is less more? Proponents of behavioral theory have argued for the positive benefits of slack (Bourgeois, 1981; Cyert & March, 1963), while others have argued that having fewer resources may improve performance (Baker & Nelson, 2005; Mosakowski, 2002). My arguments here combine both behavioral and resource constraints views. The results provoke a reframing of the theoretical question for future research from the simple question of *whether* slack is good for performance to a more complex set of questions: *How much of what form* of slack is good for performance? and *When* is slack good for performance?

Two distinct findings from this study inform a behavioral perspective on resource slack. First, economic performance increases and then decreases with an increase in low-discretion slack, but performance is positively related in linear manner to increases in high-discretion slack. Behavioral arguments emphasize a linear positive relationship, emphasizing the principle that more slack is better for appeasing coalitions, experimentation, and risk taking. My finding suggests that specific forms of slack may have decreasing returns, depending on the level of discretion that the slack provides managers, and that redeployment of large amounts of low-discretion slack can be counterproductive.

Second, when the resource demand and resource availability components of transient slack are analyzed separately, the results are intriguing and informative. Resource demand has a strong, positive relationship with performance; expressed graphically, it is slightly concave rather than inverted U-shaped. Greater resource demand is related to higher levels of performance. Resource availability exhibits a slightly concave relationship with performance: substantially negative (−1 standard deviation [s.d.] from the mean) resource availability was associated with high performance ($240.1 million), and substantially positive (+1 s.d.) resource availability was associated with low performance ($5.57 million), while the mean level of resource availability was associated with moderate performance ($131.9 million). Resource demand had a greater impact on performance ($−788.1 to 1,036.8 million at −1/+1 s.d.) than resource availability.

This finding is theoretically important because it underscores that resource availability in excess of resource demand is unlikely to enhance performance in privately held firms. These results encourage researchers to consider a distinction between "absolute-to-external peers" and "relative-to-internal demands" forms of slack. Although these results support the idea of resource constraints having a positive performance effect, further exploration using samples of entrepreneurial high-growth firms is necessary before conclusions about the nature and dynamism of this relationship can be drawn. The present results should be suggestive enough to persuade scholars to pay close attention to the research question and its sensitivity to the different forms of slack. In sum, behavioral arguments that suggest linear positive relationships between all forms of slack and performance do not receive unconditional support in privately held firms. The results suggest possible boundaries to the assumptions of behavioral theory arguments, particularly the argument that managerial discretion has positive performance consequences in all contexts.

Age and Industry Effects

There are interesting organizational and environmental findings in this study. The interaction between age and slack was significant in most cases, with the exception of low-discretion slack. High-discretion slack appeared to be of greater importance for older firms that have more predictable resource needs. Age modified the slope of the relationship between slack and performance (Figures 1a and b). A shortfall (−1 s.d.) of high-discretion slack had a greater negative consequence ($–106.2 million) for the performance of older firms than for the performance of younger firms ($–7.91 million). An excess (+1 s.d.) of high-discretion slack had a greater positive effect on performance in older firms ($281.5 million) than in younger firms ($213.7 million). Younger firms tended to exhibit sharper increases in performance when resource availability was high ($179.8 million) than when availability was low ($67.8 million). Even when availability was negative relative to the industry average, younger firms tended to show positive performance levels (Figure 1b). The impact of age on resource availability in older firms was more modest; there were marginal increases in performance from $102.3 million at low availability (−1 s.d.) to $118.3 million at high resource availability (+1 s.d.). This finding suggests that the impact of slack varies with age of a firm and the type of resource.

Interesting results in the moderating effects for industry complexity emerged as well. Findings supported my hypothesis that an increase in industry complexity makes the relationship between slack and performance more negative (Hypothesis 4). Further analysis revealed that the pattern of influence on resource availability requires a more complicated explanation (Figure 2b). In low-complexity industries, performance changes from $208.7 million to $60.9 million at −1/+1 s.d. of resource availability. However, in high-complexity industries, performance changes from $521.1 million to $−84.1 million at −1/+1 s.d. of resource availability. We find that when resource availability is constrained (−1 s.d.), performance is substantially higher in high-complexity industries than in low-complexity industries. When resource availability is high (+1 s.d.), performance is lower (more negative) for high-complexity industries. The effects of complexity appear to be more pronounced when resource constraints exist. This finding directly addresses the managerial and theoretical relevance of resource constraints by articulating the impact of environment on slack deployment.

The moderating effect of complexity on the relationship of resource demand and performance also adds to the value of my findings. The magnitude of effect for resource demand on performance appears to be higher than the impact of resource availability on performance. In low-complexity industries, performance changes from $−1,049.9 million to $709.5 million at −1/+1 s.d. of resource demand (Figure 2c). In high-complexity industries, performance changes from $−861.8 million to $461.1 million at −1/+1 s.d. of resource demand. Here, as resource demand increases, performance increases in tandem, but it does so at a slower rate when complexity is higher. Taken together, findings on resource availability and demand have competing influences on performance. In a broader pattern, higher resource demand is associated with higher levels of performance, while moderate negative levels of resource availability are associated with positive performance levels. These moderated effects suggest that resource constraints mechanisms are more complex and dependent on organizational and environmental factors than theorized in this paper and in other studies. Both age and complexity interaction effects imply that resource constraints influence performance, but further research is required to fully explore the intricacies of this argument.

Publicly Held versus Privately Held Firms

Some studies of slack have combined behavioral and agency theory explanations of risk taking in publicly held firms (Deephouse & Wiseman, 2000). Although agency explanations may be appropriate in large, publicly held firms, the agency relationships in privately held firms may be different or absent (Fama & Jensen, 1983). The theoretical and practical implications of slack levels in firms raise important and interesting questions. However, the lack of sampling and measurement consistency across studies of slack forecloses comparison of public and private firms. It is likely that slack is important for different reasons in public and in private firms. Future research will need to reconcile the theoretical differences and the pattern of relationships between privately and publicly held firms in a longitudinal setting.

My study focused on privately held firms, but fine-tuning of the current sample could expand researchers' limited knowledge of slack and its role in organizational processes. For example, the distinction between nascent ventures, high-growth firms (prior to initial public offering) and high-growth (post-IPO) firms may increase the theoretical richness of the slack construct. Similarly, the motivations and behaviors of managers may differ for pre-IPO and post-IPO firms as the scrutiny of

public markets and the pressing need to deliver positive results every fiscal quarter is minimized in pre-IPO firms. Further research may help categorize the behavioral differences among these firms and may help further refine the logic for the slack-performance relationship.

Limitations and Conclusions

Despite the care taken with the analysis and the benefits of longitudinal study of privately held firms, the present research has some limitations. First, though the classification using the discretionary nature of assets is appropriate for diverse forms of slack, operational definition of slack using financial data does not account for other types of slack. For example, resource endowments in social capital, human capital, or organizational capabilities can be extended for the influence of slack within these types of resources and its impact on entrepreneurial outcomes such as new market entry. Because firms need to invest resources to build organizational capabilities and, therefore, incur costs before any payoffs are imminent (e.g., George, 2005), slack resource endowments may play a particularly important role in the enactment of strategies and the evolution of firms. Further investigation of the multiple forms of slack resources and entrepreneurial firms' ability to leverage and deploy slack across potential alternate applications for a specific resource are interesting and fruitful avenues for scholarly inquiry.

Second, the longitudinal design provides some temporal stability to these results, but these data are restricted to a single time frame (1994–97). Though I controlled for year effects, an extension to this study might use panel data to account for different economic scenarios. Also, a longer time frame could capture the dynamism in slack over time. It is likely that slack levels change over time, and tracking this change might allow for a richer theoretical argument than presented in this article. Third, since slack and size are correlated, there are likely to be variations across industries in the impact of slack on performance. Though I controlled for industry effects, further studies might examine multiple forms of slack in a single industry. For example, augmenting work on slack in network resources in the biotech industry and its impact on innovation (e.g., George, Zahra, & Wood, 2002), inclusion of financial and other forms of slack such as human and social capital could provide a holistic picture of an organization's use of multiple resource endowments. Finally, the influence of age on slack deployment is an understudied area. Slack may assume greater levels of strategic importance at certain stages of growth. For instance, slack may be critical during growth stages but may be absent then. The implications of slack for growth in entrepreneurial firms is an important issue that needs to be addressed methodically.

Limitations aside, this is the first study to theorize and test causal relationships between slack and performance in a longitudinal sample of privately held firms. I found that the pattern of relationships differs with the form of slack (high-discretion, low-discretion, transient), and this finding contributes to organizational theory that has, hitherto, addressed positive linear relationships between slack and performance. The results support the resource constraints argument in privately held firms. Support for this argument is seen especially when organizational age and industry complexity are considered as moderators. Taken together, the findings offer preliminary evidence of the compatibility of behavioral and resource constraints arguments in explaining the dynamic of the slack-performance relationship in the context of privately held firms.

Although I concentrated on privately held firms, my findings on the pattern of resource demand and availability might also apply in public firms. Thus, this study contributes to pertinent discussion on the leveraging of organizational resources to enhance performance through the adaptation and enactment of strategies in competitive environments. Future studies can leverage these findings to provide comprehensive behavioral explanations for the patterns and temporal dynamism in the generation and deployment of slack resources to achieve organizational goals.

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