SELECTION PROCESSES: FIRMS VERSUS CAPABILITIES

Annetta Fortune
LeBow College of Business
Drexel University
101 N. 33rd Street, Academic 323
Philadelphia, PA 19104
E-mail: af69@drexel.edu
Telephone: (215) 895-1796
Fax: (215) 895-2891

Will Mitchell
Fuqua School of Business
Duke University
Towerview Drive
Durham, NC 27708
Email: willm@mail.duke.edu
Telephone: (919) 660-7994
Fax: (919) 681-6244

Version AvD_2005_05_24c: May 24, 2005

Key words: selection, capabilities, acquisition, and dissolution
SELECTION PROCESSES: FIRMS VERSUS CAPABILITIES

Abstract

Evolutionary theory studies selection processes by which organizational entities exit environments that they do not fit, but most work has underemphasized the distinction between selection of firms and selection of their underlying capabilities. This paper argues that the extent of organizational capabilities that struggling firms possess affects the type of selection process they face when they exit an industry. Dissolution represents selection of the entire firm, including its underlying capabilities. In contrast, acquisition represents selection of only the corporate entity, while representing adaptation at the capability level through the preservation of potentially valuable capabilities. Acquirers have incentives to acquire failing firms that possess potentially valuable capabilities because these firm-specific capabilities face market failures in discrete exchange. Hence, the more organizational capabilities that a struggling firm possesses, the more likely it will be acquired rather than dissolved when it exits the industry. We assess managerial and functional capabilities in terms of the number and nature of executive positions, which provide generalizable measures of organizational capabilities, as well as using business age and size as general measures of organizational capabilities. The study advances evolutionary theory by demonstrating that organizational capabilities create selective and adaptive implications in the evolution of the market by influencing the mode of exit for struggling firms.
Studies of industry evolution typically view the exit of failing firms as the result of a selection process that removes struggling businesses from an industry (Nelson and Winter, 1982; Hannan and Freeman, 1989). Selection means elimination of an entity that does not suit a particular environment. In turn, several studies argue that dissolution and acquisition exits represent distinctly different selection processes, such that business dissolution removes both a corporate entity and its underlying capabilities, while business divestiture removes a failing corporate entity while preserving some of its organizational capabilities (Aldrich, 1979; Baum and Korn, 1999). Several studies imply that the existence of potentially valuable capabilities that would face market failure in discrete exchange creates incentives for other companies to acquire struggling firms, rather than let them dissolve (Wernerfelt, 1984; Capron, Dussauge, and Mitchell, 1998). No studies, though, have examined whether the availability of organizational capabilities discriminates between the acquisition and dissolution of failing firms. This paper measures organizational capabilities and determines whether the presence of the capabilities affect selection processes of struggling firms.

The foundation for the study draws on theories that emphasize the importance of firm-specific capabilities in business strategy. The core literature includes evolutionary economics (Nelson and Winter, 1982), resource-based theory (Wernerfelt, 1984), and dynamic capabilities arguments (Teece, Pisano, and Shuen, 1997; Eisenhardt and Martin, 2000; Karim and Mitchell, 2000). We focus on two types of capabilities: managerial and functional capabilities. We predict that failing firms with stronger managerial and functional capabilities are more likely to become acquisition targets than to shut down. The study advances evolutionary theory and related views of the business organization by demonstrating that acquisition provides a selection mechanism that helps preserve failing firms' organizational capabilities within the business landscape.
The analysis focuses on business exits of 172 struggling firms in the Internet sector during 2001. We measure managerial and functional capabilities based on the number and nature of executive positions within the firms. Established research in sociology and organizational theory supports the idea that executive positions reflect important activities within a firm. The use of executive positions as measures of managerial and functional capabilities extends resource-based and dynamic capabilities research by providing generalizable process-oriented measures of capabilities.

**THEORY**

**Background: Selection, Firms, Capabilities, and Market Failure**

Evolutionary theories of organizational change (e.g., Nelson and Winter, 1982; Aldrich, 1999) note that some firms struggle to meet the demands of their environment and reside at the margins of survival. Struggling firms that do not improve typically exit their industries, whether by shutting down or by being acquired by another company.

We will focus on how different selection events affect struggling firms and their capabilities. Firms are legal entities that operate in a business environment. Capabilities are the physical assets, human capital, and organizational knowledge that firms use as inputs for their business activities (Amit and Shoemaker, 1993). Some capabilities are quite general and can be transferred easily among firms. Many capabilities, though, involve organizational processes that face substantial market failures in discrete exchange between firms (Penrose, 1959; Wernerfelt, 1984). We will refer to capabilities that involve extensive organizational processes as organizational capabilities.

Exit by dissolution and exit by acquisition denote different selection events for firms and their organizational capabilities. At the level of the firm, both dissolution and acquisition are
forms of selection – the firm ceases to exist as an independent entity. At the level of organizational capabilities, however, the two types of exit contrast selection with adaptation outcomes. As we noted earlier, selection means the elimination of entities that do not suit an environment (Nelson and Winter, 1982). In parallel, we use the term adaptation to mean changing an entity in a way that creates the potential to survive in a given environment (Levinthal, 1994).

Dissolution is a form of capability selection, because dissolution removes firms’ organization-specific capabilities from the economic and social landscape (Aldrich, 1979). Typically, dissolution means that organizational units of the closing firm disband, which eliminates the firm’s organizational capabilities. Thus, dissolution results in selection of the firm and its capabilities.

By contrast, acquisition represents adaptation at the level of organizational capabilities, despite being a form of firm-level selection. Acquisitions have the potential to preserve some of the organizationally-embedded capabilities and resource configurations that existed within the acquired firm, albeit often after being altered within the acquirer’s legal and organizational entity. Post-acquisition capability adaptation typically involves some combination of selective retention, elimination, and reconfiguration of elements of the organizational capabilities. That is, the acquirer usually retains some of the target’s organizational processes in their original form, eliminates some organizational processes that were part of the target, and incorporates other acquired organizational processes with processes at the acquiring firm. The process of retention, elimination, and reconfiguration results in substantial changes of the original organizational capabilities, but without the wholesale destruction that takes place in the case of dissolution.
Hence, acquisitions and dissolutions have substantially different impact on organizational capabilities and, indeed, on the overall evolution of the markets in which firms use capabilities. Acquisitions retain organizational capabilities within markets, albeit typically in changed form. By contrast, dissolution breaks up organizational capabilities and releases them from a market (Mitchell, 1994).

The importance of capabilities that are embedded in organizational processes is a central argument of strategy theory. In her seminal resource-based arguments, Penrose (1959) highlighted the importance of resource manipulation in generating competitive advantage, as opposed to the nature of the resources themselves. The more recent dynamic capabilities perspective builds on this sentiment by emphasizing organizational capabilities as key contributors to competitive advantage (Teece et al., 1997; Eisenhardt and Martin, 2000).

Table 1 summarizes the literature addressing organizational capabilities, highlighting the distinction between managerial and functional capabilities. Managerial capabilities are processes that coordinate and integrate overall firm activities, while functional capabilities are processes involved in the production of specific goods and services. We distinguish between managerial and functional capability endowments because they have a different scope of activity, with managerial capabilities typically spanning more broadly across an organization than functional capabilities, which tend to dig more deeply within particular classes of activities.

********** Table 1 about here **********

The concept of market failure is an important part of the capabilities perspective on business dissolution and acquisition. Market failure arises when it is difficult to negotiate and accomplish an exchange for an asset. Some market failures arise because one party knows more about the value of an asset than another party (asymmetric information). Other market failures
arise because neither party can accurately specify the value of an exchange (bilateral lack of information). Market failure arguments suggest that firms sometimes use business acquisitions to obtain organizational capabilities resident within another firm (Capron, Dussauge, and Mitchell, 1998). As we discuss below, the more extensive the organizational capabilities of a struggling firm, the more likely that it will become an acquisition target rather than simply shut down.

Conceptual Model: Independently Viable Firms versus Exiting Struggling Firms

The conceptual frame of this work, which Figure 1 depicts, involves two questions: first, whether a firm is viable as an independent entity and, second, if not independently viable, whether dissolution or acquisition will occur. The lower portion of the figure depicts our core question, concerning how organizational capabilities influence the exit mode (dissolution versus acquisition) of struggling firms. The upper portion of the figure, which is beyond the scope of the study, depicts a similar research question concerning firms that are independently viable.

******* Figure 1 about here *******

Figure 1 highlights the need to distinguish between viable and struggling firms. Because many acquisition targets are profitable businesses with strong capabilities (Ravenscraft and Sherer, 1989), including successful firms in the study could overstate the capability endowments of firms that exit via acquisition relative to those that shut down. In turn, this would confound the effects of profitability and organizational capability in determining business fates. To avoid this selection issue, we will limit the sample to struggling firms, as we discuss in the data section.

HYPOTHESES: CAPABILITIES AND BUSINESS EXITS

Managerial Capabilities

Since the work of Penrose (1959), the resource-based view of the firm emphasizes the value of resource manipulation. Contemporary work echoes this sentiment and suggests that this
responsibility predominately resides in the managerial levels of the firm (Mahoney, 1995). Specifically, capabilities residing within the hands of upper management involve coordination, integration, and deployment of other resources throughout the organization (Teece et al., 1997). Processes that fall within this category include processes that enable a firm to integrate, utilize, and reconfigure firm activities (Henderson and Cockburn, 1994), including capabilities related to changing a firm’s mission and activities (Collis, 1994).

The notion of managerial capabilities has roots in several other notions, as Table 1 reports. Relevant managerial processes include architectural competence (Henderson and Cockburn 1994), integrative capabilities (Lawrence and Lorsch 1967), dynamic capabilities (Teece, Pisano, and Shuen 1992), collective knowledge (Spender 1996), organizational architecture (Nelson 1991), combinative capabilities (Kogut and Zander 1993), managerial systems, values, and norms (Leonard-Barton 1992), and invisible assets (Itami 1987). The common thread connecting these terms is the directive nature of the capabilities.

Several empirical studies have focused on the presence and impact of managerial capabilities. Studies of processes with names such as architectural competence (Henderson and Cockburn, 1994), integrative capability (Yeoh and Roth, 1999), and integration capability (Zollo and Singh, 2002) show that managerial capabilities influence firm performance. Other work finds similar results when investigating more specific types of managerial processes, such as customer, internal, and technology integration activities (Iansiti and Clark, 1994), as well as change management, innovation management, and participative management (Hall, 1993).

Market failures create incentives for firms to acquire struggling firms as a means for accessing their managerial capabilities. Managerial capabilities face market failure due to the
embeddedness of these capabilities within the broader context of the organization, which makes it difficult to isolate and value these capabilities discretely.

Managerial capabilities typically involve both people and processes. In order to obtain a set of managerial capabilities, a buyer typically would need to identify a wide range of individuals throughout a firm who work together to carry out managerial activities across the firm. Negotiating individual contracts with multiple members of a formal or informal managerial team is often impossible. Moreover, many of the activities that the team of individuals carries out in their managerial roles involve a wide range of processes such as accounting systems, incentive and reward systems, planning systems that are difficult to extract from their organization-specific context. As a result of the inability to purchase managerial capabilities discretely, owing to the market failures, firms can turn to acquisition of the entire firm as a way to obtain the capabilities, intending to undertake the process of extracting and revising the capabilities after the acquisition (Capron, et al. 1998).

Thus, the difficulty in replicating the desired managerial capabilities of another firm contributes to the use of business acquisition as a mode of obtaining potentially valuable capabilities. Part of the value inherent in a set of managerial capabilities resides in the complex and causally ambiguous nature of the capabilities and their embeddedness within the firm (Barney, 1991). Moreover, similar to other organizational skills, managerial capabilities possess an element of path dependence (Teece et al., 1997) and involve a given pattern of learning (Zollo and Winter, 2002), which inhibits the precise replication of these capabilities because recreating the historical context is impossible. Consequently, a struggling firm possessing extensive managerial capabilities is more likely to exit via acquisition as opposed to dissolution because the possession of managerial capabilities makes the struggling firm a more attractive target.
It may appear surprising the acquirers would be interested in the managerial capabilities of a struggling firm. After all, the fact that the firm is struggling suggests that it has limited managerial competence. However, even struggling firms often have elements of strong capabilities that are not sufficient by themselves to engender a successful business, but would have value in helping another firm build an aggregate set of capabilities. Thus, even struggling firms may possess desirable capabilities that attract potential acquirers.

**Hypothesis 1**: The more managerial capabilities that a struggling firm possesses, the more likely the firm will exit via acquisition rather than by dissolution.

**Functional Capabilities**

The roots of functional capability lie within functional areas of the firm (Amit and Schoemaker, 1993) and reside in the line and staff activities of the firm (Teece et al., 1997). Functional capabilities embody the operational functioning of the firm (Zollo and Winter, 2002) and relate to "the [firms’] ability to do specific things…” (Hall, 1993: 610). Functional capabilities include activities such as R&D (Verona, 1999; Henderson and Cockburn, 1994), marketing (Verona, 1999; Collis, 1994; Henderson and Cockburn, 1994), distribution (Collis, 1994), manufacturing (Verona, 1999), and production (Collis, 1994) processes. The notion of functional capability encompasses concepts such as component competence (Henderson and Cockburn, 1994) and technical systems (Leonard-Barton, 1992; Teece, Pisano, and Shuen, 1992), as Table 1 reports. Because functional capabilities often evolve within a firm-specific context, they often lack direct substitutes and may be difficult to imitate, which implies that functional capabilities represent potential contributors to competitive advantage (Barney, 1991).

Empirical evidence supports the idea that a distinct set of organizational processes falls within the category of functional capability. Prior research indicates that measures of component capability, technological capability, technical capability, and research capability contribute to
sustained advantage (Yeoh and Roth, 1999), improved performance (Lee, Lee, Pennings, 2001), entrepreneurial wealth (Deeds, 2001), and IPO capital (Deeds, Decarolis, and Coombs, 1997).

Similar to managerial capabilities, the combined effects of market failure and barriers to replication create incentives to use acquisitions in order to obtain the functional capabilities of a struggling firm. Market failures arise because historical context and learning processes influence the development of functional capabilities, which in turn lead to organizational embeddedness. Consequently, the possession of extensive functional capabilities makes a struggling firm an attractive acquisition target.

**Hypothesis 2:** The more functional capabilities that a struggling firm possesses, the more likely the firm will exit via acquisition rather than by dissolution.

The question arises of whether managerial or functional capabilities will have greater influence on exit types. We expect managerial capabilities to have stronger impact than functional capabilities in influencing acquisitions. As we noted above, both managerial and functional capabilities incur market failures. However, managerial capabilities will commonly face greater market failures as a result of their directive role and involvement of people and processes that permeate the entire organization. This integrative role makes the discrete transfer of managerial capabilities more difficult than transfer of functional capabilities, which often relate more closely to people and processes within a specific area within the firm. As a consequence of increased market failure, managerial capabilities will have more influence than functional capabilities in determining the likelihood a struggling firm will exit via acquisition.

**Hypothesis 3:** Managerial capabilities will be more influential than functional capabilities in determining acquisition of struggling firms.
Business Age and Size

Finally, we consider the relationship of business age and size to organizational capabilities. Age and size complement the investigation of managerial and functional capabilities, because they do not indicate the presence of specific categories of organizational capability.

Previous work demonstrates that younger and smaller firms have a higher failure rate relative to older and larger firms. Population ecology research demonstrates that failure rates decline with age and size (Carroll and Delacroix, 1982; Carroll, 1983; Freeman, Carroll, and Hannan, 1983; Singh, House, and Tucker, 1986), arguing that liabilities of newness and smallness result from a lack of resources, legitimacy, and stability. Similarly, institutional theory suggests a higher failure rate new and small firms that lack connections, approval, and support of the institutional environment (Meyer and Rowan, 1977; Scott and Meyer, 1983; Baum and Oliver, 1991). This work builds on such studies by exploring the capability-based rationale for the effects of age and size in determining which type of exit that struggling firms encounter.

Because capabilities build up over time, older firms tend to possess larger stocks of organizational capabilities. Learning and storage of knowledge necessitate the passage of time because the learning process entails both repetition and experimentation (Teece et al, 1997: 520). Persistent poor performance, which precipitates the inability of the struggling firm to continue independently, suggests the presence of a misalignment with the environment. Nonetheless, even a struggling firm may possess valuable capabilities. Consequently, an older struggling firm is more likely than a younger firm to exit via acquisition as opposed to dissolution.

**Hypothesis 4a**: The older a struggling firm, the more likely the firm will exit via acquisition rather than by dissolution.
Larger firms also tend to have greater stock of organizational capabilities. The social and interactive aspects of organizational learning reside within groups (Teece et al., 1997). Increased firm size contributes to the development of organizational capabilities by providing the potential for a more varied and complex set of interactions. This condition contributes to the value of organizational capabilities by hampering imitation and replication (Teece et al., 1997; Barney, 1991), in addition to increasing causal ambiguity.

Greater firm size indicates two potential sources of value within a struggling firm. First, greater size indicates the potential presence of well developed organizational capabilities because larger size creates more opportunities for learning. Second, greater firm size indicates the potential presence of firm-specific learning mechanisms, which may possess value in the continued development and improvement of organizational and functional capabilities. Consequently, larger struggling firms are more likely to exit via acquisition than by dissolution.

**Hypothesis 4b**: The larger a struggling firm, the more likely the firm will exit via acquisition rather than by dissolution.

In sum, this work argues that possession of organizational capabilities influences the selection processes that struggling firms face. The presence of organizational capabilities makes the firm more valuable as a whole because their development is path dependent and idiosyncratic to the individual firm. The embeddedness of firm-specific capabilities compromises the ability to access or obtain these capabilities as discrete resources, causing market failures that motivate the use of acquisition to access the organizational capabilities. In the case of struggling firms, the possession of managerial and technical capabilities and the characteristics that indicate the possession of organizational capabilities, such as age and size, distinguish acquisitions from dissolutions.
Case Examples

eMation, Inc. and iWant.com, Inc. are two firms that demonstrate how managerial and functional capabilities, firm age, and firm size influence acquisition and dissolution of struggling firms. Both of these firms were private companies with headquarters in Massachusetts that operated in the software and programming industry with a primary SIC code of 7372 in the late 1990s. eMation developed device relationship management software for use in automated computing monitoring and control, while iWant.com developed direct response advertising infrastructure software. Both firms were struggling in the early 2000s. During 2001, eMation was acquired, while iWant.com shut down. The differences between eMation and iWant.com offer insights regarding why some struggling firms shut down and others are acquired.

Founded in Israel in 1986 as PC Soft, eMation had developed a relatively extensive set of managerial and functional capabilities when it was acquired in 2001. By 2001, the company had about 165 employees and $12 million in annual sales, but with a net loss of about $14 million in the 2001 fiscal year. The company’s executive team encompassed a wide range of business processes. eMation had eleven distinct executive positions across five levels ranging from senior scientist to chief officer. Senior executives acting in positions such as CEO, CFO, president, senior vice president, and general managers of geographic regions were responsible for an extensive set of integrative managerial processes within the company. In parallel, senior executives in functional positions for human resources, sales, marketing, and R&D were responsible for an extensive set of functional processes.

In 2001, the software company Ravisent acquired eMation for about $27 million, and then in 2002 combined the two businesses to create an enterprise software and services company called Axeda Systems, Inc. When it announced the acquisition of eMation, Ravisent stated that it
wanted to obtain eMation’s skills in the “pervasive computing” market, particularly eMation’s technology that gives users access to remote computers. Navisent stated that it planned to focus its attention on the products and services that it acquired with eMation, and that the executive team of the target company would play critical roles in helping Navisent develop the acquired technology. The CEO of eMation joined Navisent’s board and then became President of Axeda, while senior technical and sales executives from eMation also played leading roles in the new company, along with members of their staffs.

The contrasting example, iWant.com, began operations in 1999, raising about $20 million of initial investment capital. The company began as a “shop-by-request” web-based service in which buyers posted notices about products that they wanted to buy, and then attempted to transform itself into a web-based advertising services firm. iWant grew to about 25 employees and $1 million in revenue, but had substantial losses. iWant.com shut down in June 2001, after the company and its venture capital investment firm failed in attempts to attract a buyer.

iWant.com’s limited range of capabilities contributed to its inability to find a buyer. iWant was smaller and younger than eMation. In addition, iWant had a simpler underlying set of capabilities, reflected in its smaller and less elaborate executive team. iWant.com had only six executive positions, ranging from area director to chief officer. The positions of CEO, CFO, and director of finance encompassed the firm’s managerial processes. In parallel, executive positions related to engineering, operations, and sales encompassed iWant’s functional processes. Relative to eMation, iWant.com possessed a smaller range of business processes. Firms that wanted to gain access to iWant’s skills could simply hire individual senior executives, rather than purchase the company; for instance, after the dissolution, the company’s CFO became CFO of a wireless system provider that was funded by one of the investment companies that had provided iWant’s
initial capital. The differences across these two case examples illustrate the idea that endowments of managerial and functional capabilities help distinguish between acquisitions and dissolutions of struggling firms.

METHODS

Data and Methods

We tested the hypotheses in the context of existing internet businesses during 2001. The context suits the study because of the varied capability base of the companies (Whinston, Barua, Fang, and Susaria, 2001), as well as the high incidence of acquisition and dissolution activity within this sector. During calendar year 2001, about 537 Internet companies shut down (Webmergers, Inc., 2002a) and another 1,289 acquisitions occurred (Webmergers, Inc., 2002b). We were able to obtain detailed information that we could use to construct capability profiles for 177 of the exiting firms.

We used several different sources to identify the population and to establish the sample, which included public and private firms in multiple industries within the Internet sector. OneSource and Lexis-Nexis databases provided the primary sources for company information. We also used publications of Webmergers, Inc, the Industry Standard, and the Securities and Exchange Commission (SEC) to gather additional information and to track company status. Due to the lapse of time that sometimes occurs between the halt of operations and a subsequent acquisition, we continued the data collection during 2002 to confirm that none of the apparent dissolutions in the sample later became acquisitions.

We employed two sample selection techniques to eliminate successful acquisition targets from the sample. First, we excluded firms that reported positive net income from the sample, but profitability information was available for only about one-third of the sample. Second, when we
lacked profitability information, we excluded firms from the sample if their productivity efficiency ratio (sales per employee) exceeded 0.30. We determined the productivity efficiency cutoff based on the analysis of productivity levels and company exits at the end of 2001 for a random sample of 300 taken from a population of 17,262 firms within the high technology product classification codes of the OneSource database. At productivity efficiency levels of 0.30, the incidence of dissolution decreased noticeably. At sales per employee below 0.30 (inefficient firms), the incidence of dissolution was 41%; at productivity efficiency levels above 0.30 (efficient firms), the incidence of dissolution was only 19%. We eliminated five acquisitions from the sample based on the profitability and productivity benchmarks for successful operations. This reduced our original sample size from 177 to 172 firms, each of which we could appropriately identify as a struggling firm, with 90 firms that shut down and 82 firms that were acquired during 2001.

Several major characteristics of the firms in the sample stand out. Fifty-nine percent of the firms fell within the SIC Major Group 73 of business services, such as prepackaged software and information retrieval service firms. The remaining firms were distributed among eleven other SIC Major Groups. Private firms account for 70% of the sample. Parent companies account for 87% of the sample. The firms were often young and small. About 50% of the firms in the sample had annual sales of $11 million or less, while about 50% of the firms had 100 or fewer employees. Furthermore, about 70% of firms in the sample were five years old or younger (90% were less than 10 years old).

We used logistic regression to explore the impact of organizational capabilities on the acquisition and dissolution of struggling internet businesses. Logistic regression is an appropriate technique given the dichotomous dependent variable (acquisition versus dissolution).
Variables

Managerial and functional capabilities. We measured managerial and functional capabilities with counts of the number of executive positions in the firms. The motivation for using these measures of capability draws from a desire to develop generalizable, process-oriented measures of capability. Previous measures of capability such as patents, the number of drugs in clinical trials, and R&D spending are industry specific and not appropriate for an investigation of a diverse set of firms such as those active in the Internet sector. Such measures are also primarily outcome-based measures since because reflect the result of organizational capabilities rather than the capabilities themselves. By drawing measures of organizational capabilities from the executive lists of firms, we aim to capture the presence of organizational processes.

Sociology and organizational research offers support for the relationship between executive positions and underlying organizational processes. Inkson, Pugh, and Hickson (1970) originally showed that counts of organizational positions were valid measures of functional specialization. Kazanjian and Rao (1999) later drew on the Inkson et al. work to support using the count of job positions as a measure of engineering/technology-based capabilities. In a seminal paper within the sociological stratification literature, meanwhile, Baron and Bielby (1986) found that proliferation of job titles and positions reflected technical and administrative imperatives aimed at increasing the efficiency of firm activities. The study rejected the alternative argument that a proliferation of job titles simply indicated political and institutional processes, rather than economic value. These findings indicate that job titles reflect underlying task activities within an organization, which supports the relevance of job titles as measures of organizational capabilities.
Interviews with two knowledgeable executives corroborated the arguments from sociology and organizational research that counts of executive positions provide meaningful measures of organizational capabilities. The executives held senior positions within their firms (CEO and Chief Relationships Officer). Discussions with both executives confirmed that the positions listed on the executive lists reflect important activities and processes within their firms, even though the executives of smaller firms sometimes fill multiple roles. In addition, the discussions corroborated the distinction between managerial and functional positions.

Table 2 depicts the scheme for classifying the executive positions as managerial and functional. We considered all C-level positions as managerial. We classed executives with general duties as managerial positions. We classed executives with specific operational duties as functional positions. The analysis grouped the measures of managerial and functional capability within similar levels. We combined all C-level positions within one group. A second group includes Executive Vice Presidents, Senior Vice Presidents, and Vice Presidents (EVP, SVP, VP). A third "Below VP" group includes Director and lower executive titles.

********** Table 2 about here **********

**Age.** We measured business age as the number of years that the firm existed, beginning with the year of founding and ending in the year the firm exited, whether by dissolution or acquisition.

**Size.** We measured business size as the annual revenue of the firm (millions of dollars). Both annual sales and the number of employees are common measures of firm size. For this study, annual sales represent a more relevant measure of capabilities. The presence of organizational processes that will help produce revenue is our central concern. Consequently, a
measure of size that captures a firm’s ability to generate revenue is more relevant than the number of employees, which may simply indicate inefficient over-staffing.

Table 3 provides the descriptive statistics and the correlation matrix. The most notable correlations are those between firm sales and the measures of managerial and functional capabilities. As one would expect, there are positive correlations between sales and the number of managerial and functional executive positions, but the correlations are far from identities – there is substantial variation in the number of executive positions, independent of firm size. Similarly, there is moderate correlation among some of the managerial and functional capability measures, but again with substantial variation.

********** Table 3 about here **********

**Controls.** We included a business services industry dummy variable to control for macro-level industry segment effects. This variable is coded 1 if the firm is in the business services industry (SIC Major Group 73), which included over 50% of the sample. Sensitivity analyses found no effect of including a dummy variable for firms in the Communications industry (SIC Major Group 48), which had the second highest representation in the sample (about 10%). Sensitivity analyses also found no significant influence for control variables that measured either productivity (sales per employee) or the size of the executive team (number of executive positions, number of people on the executive team, or the number of levels in the executive team).

**RESULTS**

Table 4 reports the results of the logistic regression models. Model 1 serves as the baseline model. The baseline model has significant explanatory power ($\chi^2$ likelihood = 148.8).

********** Table 4 about here **********
Model 1 in Table 4 supports Hypotheses 4a and 4b, showing that the capabilities associated with firm age and size influence selection processes. The significance of the age and size effects is highly consistent across models, although the magnitude of the effects becomes smaller once we add the other capability measures.

Model 2 of Table 4 adds the managerial capability measures. The results support hypothesis 1 with respect to executives with responsibility for the most wide-ranging business processes, showing that C-level managerial capability has a significant impact on acquisition ($\beta = 0.31$, $p=0.03$).

It is notable that only the C-level variable among the managerial capability measures influenced acquisition. The other two measures of managerial capability (EVP-SPV-VP; below VP managerial executives) had no influence on selection processes. This contrast suggests that the capabilities with the strongest firm-specific value to acquirers are those with the most general and greatest degree of integrative scope across a firm's activities, which is the primary purview of C-level executives. At the same time, though, there is substantial correlation of C-level positions with the other two managerial capability measures ($r= 0.50$), so that to some extent the C-level measure is picking up a more general factor of managerial skill.

Model 3 of Table 4 replaces the managerial capability variables with the measures of functional capability. The results do not support hypothesis 2 for either of the two measures of functional capabilities. Indeed, the functional capability variable that denotes the number of executives at the vice president level (EVP-SVP-VP) has the opposite direction of the predicted relationship, falling just outside common significance levels ($\beta = -0.14$, $p=0.13$). This result suggests that acquirers seem to prefer struggling targets with less functional capability, which is both counterintuitive and intriguing. Consequently, this result generates additional questions...
regarding the influence of other factors, such as a favored configuration or a curvilinear effect, which may explain this relationship. We discuss investigations that probe this unexpected result toward the end of this section.

To explore robustness of the results, we estimated models that entered each of the managerial and functional capability measures separately along with the variables of the baseline model. For brevity, we do not report results of these sub-models. The results for the individual capability measures in the sub-models were consistent with the results in Models 2 and 3.

Model 4 of Table 4 includes all the measures of managerial and functional capability. The results continue to support hypothesis 1, as C-level managerial capability holds its significance in this model ($\beta = 0.32, p=0.02$). The first functional capability measure (EVP, SVP, VP) continues to have a near-significant unexpected negative impact on acquisition ($\beta = -0.17, p=0.11$). Thus, the results in model 4 support Hypothesis 3, which predicted that managerial capability would be a more important determinant of an acquisition than functional capability.

Model 5 tests the robustness of the effects of C-level managerial capability and functional capability (EVP, SVP, VP). The model drops the insignificant capability measures. In this analysis, C-level managerial capability ($\beta = 0.23, p=0.04$) and EVP, SVP, VP functional capability ($\beta = -0.19, p=0.07$) maintain the same direction as in the previous models, while the negative functional capability effect increases in significance.

In sum, the results support hypotheses concerning managerial capabilities age, and size, while rejecting the functional capability prediction. Struggling firms with higher levels of C-level managerial capability are more likely to be acquired than to shut down (H1), with managerial capability having more impact than functional capability in determining selection.
processes (H3). Furthermore, the likelihood of acquisition increases with firm age (H4a) and size (H4b). The rejection of H2, which predicted that higher levels of functional capabilities would lead to acquisition, is particularly interesting because the result is in the opposite direction to that which we predicted.

We explored the functional capability results with two investigations of whether the configuration of functional executives might influence the selection process. First, we examined the breadth of functional capabilities, which is the number of different functional areas in which a firm has functional executives. Conceptually, capability breadth raises potential competing influences on acquisition, stemming from market failure and fragmentation. A market failure argument would suggest that thinly dispersed functional capabilities would lead to acquisition rather than dissolution because this situation exacerbates the problem of identifying and distinguishing these capabilities from the firm in which they reside. On the other hand, a fragmentation argument would suggest that more narrowly-focused functional capabilities (i.e., less dispersed) will more likely lead to acquisition because of the value of depth and understanding in a targeted set of activities. The fragmentation argument would be particularly relevant in the case of the acquisition of a struggling firm, whose overall performance indicates substantial weakness. A potential acquirer may be more interested in a struggling firm that demonstrates depth and understanding in a given functional area. To explore the role of capability breadth on the acquisition of struggling firms, we estimated additional models that included two variables specifying the number of functional capability areas (EVP to VP, below VP), as well as any interaction effects between functional capability and the breadth of functional capability. However, the variables for breadth of functional capabilities did not produce significant influence on selection processes.
Second, we estimated models to investigate the possible presence of curvilinear effects for the level and breadth of functional capabilities, which also might arise as influences of capability configuration. The level of functional capability did not have a significant curvilinear impact. Functional breadth of executives below VP, though, does have a marginally-significant curvilinear effect, as Model 6 reports. These results ($\beta_1 = -0.86, p = 0.11$ and $\beta_2 = 0.32, p = 0.12$) reveal a weak U-shaped relationship between functional capability breadth and the acquisition of struggling firms. This result suggests that acquirers have at least some interest in struggling firms with a wide range of lower level functional capabilities, where the breadth of the capabilities would create both potential value and substantial market failure in attempting to simply hire the individual executives.

**DISCUSSION AND CONCLUSIONS**

This study provides a bridge between adaptation (Cyert and March, 1963; Levitt and March, 1988) and selection (Hannan and Freeman, 1977) views on organizational change. Recent research in organizational change views adaptation and selection as complementary and interdependent processes (Singh et al, 1986; Levinthal, 1991; Aldrich, 1999). This study shows that adaptation and selection can operate concurrently at different levels of analysis. From the standpoint of organizational capabilities, acquisition represents an adaptive mechanism that preserves organizational capabilities, while dissolution represents selection because dissolution removes capabilities from the business landscape. Hence, the focus on organizational capabilities within the context of acquisition and dissolution sheds light on adaptation and selection as complementary mechanisms of market evolution. That is, acquisition and dissolution are mechanisms that connect firm-level selection with capability-level adaptation.
Specifically, acquisition represents an adaptive response that creates two selective implications for struggling firms. First, the findings suggest that acquisition targets among struggling firms are more likely to possess extensive directive and coordinating managerial capabilities, as well as somewhat broadly based functional capabilities. Second, acquisition targets are more likely to possess time-dependent and complexity-dependent capabilities, because since increased age and size provide the opportunity for capability development. In turn, struggling firms that lack directive managerial capability and broadly based functional capability face strong selection pressures at both the firm and capability level.

The finding that capabilities influence the mode of exit for struggling firms highlights the relevance of intersecting resource-based arguments with the study of business dynamics and evolutionary theory. The presence of market failure in the organizational capabilities favored by acquisition – managerial capabilities and, to a lesser extent, thinly dispersed functional capabilities – supports the resource-based rationale for acquisition and provides an insight into the role of acquisition and dissolution as mechanisms of market evolution. These results indicate that the presence of market failure in these capabilities represents an operative feature that links capability level adaptation and firm level selection within the context of struggling firms.

Following the resource-based rationale for acquisition, acquisition represents an adaptive response to obtain the capabilities within another firm given the presence of market failure for the desired capabilities. This adaptive response at the capability level selectively eliminates struggling firms that do not possess the desired capability set. Hence, the presence of market failure fostered by the characteristics of the desired capabilities links that fate of a struggling firm to the fate of its capabilities. This finding informs the discussion of market evolution given that the nature of capabilities possessed by a struggling firm influence selection processes,
acquisition versus dissolution, which represent different outcomes for the evolution of the market at both the firm and capability levels.

The results contrast with an institutional perspective on business acquisitions, which emphasizes the importance of environmental level influences such as legitimacy and isomorphism (DiMaggio and Powell, 1983) in determining the fate of firms. The institutional perspective acknowledges the effects of age and size, which represent firm level factors, but ties the explanation of these firm level effects to the connection, approval, or support of the institutional environment (Meyer and Rowan, 1977; Scott and Meyer, 1983). Hence, the institutional perspective suggests the absence of an effect for any firm level factor beyond that of age and size in determining the fate of firms. Therefore, if institutional theory is correct in its focus on environmental influences, we would not expect managerial and functional capability endowments to impact selection processes. By contrast, the presence of an effect for managerial and functional capabilities on the acquisition versus dissolution outcome demonstrates the relevance of a firm level orientation in general, and a capabilities approach in particular, when investigating the mechanisms of market evolution.

Overall, this work depicts how firm specific characteristics influence the evolution of the market, as well as stimulating additional inquiry at the intersection of the resource-based and evolutionary perspectives. The first step in continuing to enrich our understanding of the role of capabilities in organizational change would involve investigating similar, resource-based research questions across different outcomes and industries. In addition to exploring the boundary conditions of this study’s findings, additional research at the intersection of resource-based thinking and evolutionary theory could enrich our understanding of the mechanisms driving different aspects of market evolution. For example, investigating research questions that
provide a more fine-grained understanding of how and why organizational resources or capabilities influence organizational outcomes represents a fruitful line of inquiry. Lastly, the development and investigation of resource-based research questions that delineate the predominance of opposing perspectives such as adaptation versus selection and economic versus institutional provide the opportunity to advance work at the intersection of resource-based thinking and business dynamics, as well as to engage key debates within the broader strategy literature.
REFERENCES


Lawrence PR, Lorsch JW 1967. *Organization and Environment: Managing Differentiation and Integration*. Division of Research, Graduate School of Business Administration, Harvard University: Boston, MA.


Figure 1
Conceptual Model

Firm

- Financial Performance

+ Capabilities

- Capabilities

Not Viable Independently

+ Acquisition

- Acquisition

Viable Independently

- Continue Independent

More valuable in current firm

More valuable in another firm

Dissolution
### TABLE 1. MANAGERIAL VERSUS FUNCTIONAL CAPABILITIES

<table>
<thead>
<tr>
<th>Related terms &amp; dichotomies</th>
<th>Managerial Capabilities</th>
<th>Functional Capabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Henderson and Cockburn (1994)</td>
<td>Architectural competence</td>
<td>Component competence</td>
</tr>
<tr>
<td>Teece, Pisano, and Shuen (1997)</td>
<td>Dynamic capability</td>
<td>Organizational routines/competences</td>
</tr>
<tr>
<td>Verona (1999)</td>
<td>Integrative capability</td>
<td>Functional capability</td>
</tr>
<tr>
<td>Yeoh &amp; Roth (1999)</td>
<td>Integrative capability</td>
<td>Component capability</td>
</tr>
<tr>
<td>Tyler (2001)</td>
<td>Cooperative competencies</td>
<td>Technical competencies</td>
</tr>
</tbody>
</table>

**Definition**
- Processes associated with the integration and coordination of firm resources and activities.
- Processes associated with the day-to-day operational activities of the firm that are directed toward the production of products and services.

**Predominant Location in the Firm**
- Managerial levels
- Line and staff levels

**Relation to Other Firm Capabilities**
- Pervasive, directive, and transcending
- Segregated, but complementary

**Examples**
- Strategy, HR/personnel, finance, and legal
- Production, marketing/sales, engineering, and R&D

### TABLE 2. CLASSIFICATION OF EXECUTIVE POSITIONS

<table>
<thead>
<tr>
<th>Positions</th>
<th>Designation</th>
<th>Capability</th>
<th>Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>C-level (e.g. CEO, CFO)</td>
<td>All</td>
<td>Managerial capability</td>
<td># Levels on the executive list</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td># C-level positions</td>
</tr>
<tr>
<td>Executive vice president (EVP)</td>
<td>Undesignated</td>
<td>Managerial capability</td>
<td># Managerial positions EVP, SVP, VP</td>
</tr>
<tr>
<td>Senior vice president (SVP)</td>
<td>Business unit, or Division</td>
<td>Managerial capability</td>
<td># Managerial positions below VP</td>
</tr>
<tr>
<td>Vice president (VP)</td>
<td>Strategy</td>
<td>Managerial capability</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Finance/Legal</td>
<td>Managerial capability</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Human resources/Personnel</td>
<td>Managerial capability</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Administration/Communication</td>
<td>Managerial capability</td>
<td></td>
</tr>
<tr>
<td>Director</td>
<td>Marketing/Sales</td>
<td>Functional capability</td>
<td># Functional positions EVP, SVP, VP</td>
</tr>
<tr>
<td>Manager</td>
<td>Development/R&amp;D</td>
<td>Functional capability</td>
<td># Functional positions below VP</td>
</tr>
<tr>
<td>Other</td>
<td>Operations</td>
<td>Functional capability</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Engineering</td>
<td>Functional capability</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Customer relations</td>
<td>Functional capability</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Technology/E-biz/E-commerce</td>
<td>Functional capability</td>
<td></td>
</tr>
</tbody>
</table>
### TABLE 3. DESCRIPTIVE STATISTICS AND CORRELATION MATRIX

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Min</th>
<th>Max</th>
<th>Mean (Median)</th>
<th>SD</th>
<th>DV</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependent Variable</td>
<td>172</td>
<td>0</td>
<td>1</td>
<td>0.48</td>
<td>0.50</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Levels</td>
<td>172</td>
<td>1</td>
<td>7</td>
<td>3.24</td>
<td>1.29</td>
<td>.00</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Mgr. C-level</td>
<td>172</td>
<td>0</td>
<td>9</td>
<td>3.41</td>
<td>1.80</td>
<td>.14</td>
<td>.42</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Mgr. EVP, SVP, VP</td>
<td>172</td>
<td>0</td>
<td>7</td>
<td>1.21</td>
<td>1.43</td>
<td>.03</td>
<td>.55</td>
<td>.50</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Mgr. below VP</td>
<td>172</td>
<td>0</td>
<td>10</td>
<td>2.13</td>
<td>2.75</td>
<td>.14</td>
<td>.58</td>
<td>.50</td>
<td>.35</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Fun. EVP, SVP, VP</td>
<td>172</td>
<td>0</td>
<td>9</td>
<td>1.45</td>
<td>1.70</td>
<td>-.14</td>
<td>.47</td>
<td>.23</td>
<td>.37</td>
<td>.12</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Fun. Below VP</td>
<td>172</td>
<td>0</td>
<td>8</td>
<td>0.44</td>
<td>0.98</td>
<td>.05</td>
<td>.14</td>
<td>-.16</td>
<td>-.12</td>
<td>-.15</td>
<td>.00</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Communications</td>
<td>158</td>
<td>0</td>
<td>1</td>
<td>0.18</td>
<td>0.39</td>
<td>-.16</td>
<td>.03</td>
<td>-.10</td>
<td>.01</td>
<td>.01</td>
<td>.07</td>
<td>.03</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Business services</td>
<td>158</td>
<td>0</td>
<td>1</td>
<td>0.64</td>
<td>0.48</td>
<td>.11</td>
<td>.00</td>
<td>.01</td>
<td>-.09</td>
<td>-.09</td>
<td>-.01</td>
<td>.13</td>
<td>-.63</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Sales</td>
<td>137</td>
<td>0.30</td>
<td>359</td>
<td>32.75 (10.70)</td>
<td>60.61</td>
<td>.22</td>
<td>.21</td>
<td>.43</td>
<td>.36</td>
<td>.36</td>
<td>-.04</td>
<td>-.14</td>
<td>-.06</td>
<td>-.15</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>10. Employees</td>
<td>156</td>
<td>2</td>
<td>4476</td>
<td>267 (100)</td>
<td>549</td>
<td>.01</td>
<td>.11</td>
<td>.29</td>
<td>.35</td>
<td>.18</td>
<td>.04</td>
<td>-.12</td>
<td>.03</td>
<td>-.16</td>
<td>.62</td>
<td>1</td>
</tr>
<tr>
<td>11. Age</td>
<td>161</td>
<td>1</td>
<td>69</td>
<td>5.02 (3.00)</td>
<td>6.27</td>
<td>.24</td>
<td>.07</td>
<td>.11</td>
<td>-.04</td>
<td>.17</td>
<td>-.04</td>
<td>.03</td>
<td>-.12</td>
<td>-.02</td>
<td>.05</td>
<td>.05</td>
</tr>
</tbody>
</table>

r = 0.15 significant at p<0.05

### TABLE 4. LOGISTIC REGRESSION ESTIMATES OF HOW ORGANIZATIONAL CAPABILITIES INFLUENCE SELECTION PROCESSES OF STRUGGLING FIRMS

(172 cases; positive coefficient = more likely to exit by acquisition than by dissolution)

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Managerial capability: Positions (H1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td># C-level</td>
<td>0.306**</td>
<td>0.320**</td>
<td>0.227**</td>
<td>0.203*</td>
<td></td>
<td></td>
</tr>
<tr>
<td># managerial EVP, SVP, VP</td>
<td>-0.128</td>
<td>-0.064</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td># managerial below VP</td>
<td>-0.095</td>
<td>-0.088</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Functional capability: Positions (H2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td># functional EVP, SVP, VP (positions)</td>
<td>-0.13813</td>
<td>-0.16711</td>
<td>-0.190*</td>
<td>-0.169*</td>
<td></td>
<td></td>
</tr>
<tr>
<td># functional below VP (positions)</td>
<td>0.024</td>
<td>0.035</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breadth of functional capabilities: Areas</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td># functional areas below VP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-0.85711</td>
<td></td>
</tr>
<tr>
<td>(# functional areas below VP)^2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.31912</td>
<td></td>
</tr>
<tr>
<td>Age (H4a)</td>
<td>0.921**</td>
<td>0.143**</td>
<td>0.141**</td>
<td>0.145**</td>
<td>0.128**</td>
<td>0.121**</td>
</tr>
<tr>
<td>Sales (H4b)</td>
<td>0.136**</td>
<td>0.011**</td>
<td>0.012**</td>
<td>0.011**</td>
<td>0.009**</td>
<td>0.009**</td>
</tr>
<tr>
<td>Business services industry (a)</td>
<td>0.012**</td>
<td>0.853**</td>
<td>0.931**</td>
<td>0.865**</td>
<td>0.905**</td>
<td>0.964**</td>
</tr>
<tr>
<td>Log likelihood</td>
<td>-148.84</td>
<td>-144.85</td>
<td>-147.51</td>
<td>-143.28</td>
<td>-144.55</td>
<td>-142.83</td>
</tr>
<tr>
<td>Log likelihood ratio v. model 1 (df)</td>
<td>8.0 (3)**</td>
<td>2.7 (2)</td>
<td>11.1 (5)**</td>
<td>8.6 (2)**</td>
<td>12.0 (4)**</td>
<td></td>
</tr>
</tbody>
</table>

** p<0.05;  * p<0.10 (one-tailed tests)

(a) Compared to 11 other industries in the Internet sector

Note: Models 4 to 6 support H3, which predicts that managerial capabilities will have more impact than functional capabilities on acquisition.

Note: Sensitivity analyses found no influence of control variables for firm productivity or the size of the executive team.