Selection Capability: How Capability Gaps and Internal Social Frictions Affect Internal and External Strategic Renewal

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The dynamic capabilities literature suggests that firms need to use both internal development and external sourcing to thrive over time, but we have a limited understanding of the conditions that best suit different sourcing choices. This study examines how constraints that arise from firms’ existing stocks of capabilities and from their internal social contexts shape their choices of capability-sourcing modes and, in turn, their ability to obtain new capabilities. Thus, the research focuses on an underemphasized form of dynamic capability: the ability to select appropriate modes of capability sourcing.

We test the arguments with a survey and longitudinal survival study of the international telecommunications industry. We find intriguing variations in the way that firms’ selection capability influences their ability to renew their capabilities and, ultimately, to survive.

**Key words**: modes of capability acquisition; selection capability; resource gap; institutional gap; internal development; external sourcing

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Recent arguments in the dynamic capabilities literature suggest that firms need to develop skills in both internal development and external sourcing to be able to renew their capabilities and thrive over time (Helfat et al. 2006). As Agarwal and Helfat (2009) highlight, we are beginning to understand some of the means by which firms can undertake such strategic renewal both in implementing changes and, more fundamentally, in developing the ability to undertake both internal and external modes of change. Internal development allows a firm to exploit and protect its specific knowledge while also coordinating its development activities (Helfat 1994). In parallel, external sourcing of new capabilities through acquisitions, alliances, and purchase contracts helps a firm develop new capabilities that both guard against obsolescence and resolve organizational inertia (Rosenkopf and Nerkar 2001, Vermeulen and Barkema 2001). Firms that select appropriately between internal development and external sourcing as modes of obtaining new capabilities may renew their capabilities more effectively and gain long-term performance advantages.

Yet firms often struggle to discriminate between conditions that suit internal development and those that suit external sourcing. Although we have a growing understanding of the conditions under which internal development and external sourcing are most appropriate, questions remain concerning the nature of such contingencies (Eisenhardt and Martin 2000) and firms’ ability to select modes of sourcing new capabilities (Shaver and Mitchell 2003). Moreover, no large-scale study has examined the extent to which firms’ ability to select appropriate modes of capability sourcing, and thereby form coherent portfolios of internal and external sourcing projects, improves their ability to create new capabilities and to survive in dynamic environments.

In this study, we aim to examine an underemphasized form of dynamic capability: the firm’s selection capability, which we define as the ability to select among modes of capability sourcing. Several insightful studies examine the ability of firms to implement different modes of capability sourcing after the firms have selected a means of obtaining new capabilities. The studies highlight the importance of skills needed to implement external sourcing modes, such as acquisitions (Zollo and Singh 2004, Puranam et al. 2009), alliances (Kale et al. 2002), corporate venture capital investments (Benson and Ziedonis 2009), and contracts (Mayer and Argyres 2004), while emphasizing the role of recombination capabilities for internal development (Szulanski 1996, Galunic and Rodan 1998, Katila and Ahuja 2002). However, before implementing a particular means of obtaining new capabilities, a firm must select that mode, choosing between internal development and external sourcing. Indeed, there is an implicit assumption that capability-development problems primarily arise from implementation difficulties, rather than from selection mistakes.
We argue that selectively employing both internal and external modes of expansion is necessary for firms to “achieve new resource configurations as markets emerge,” as Eisenhardt and Martin (2000, p. 1107) put it. Firms need to understand the conditions under which internal or external sourcing will be most appropriate for seeking new capabilities (Jacobides and Billinger 2006). Although internal development and external sourcing can serve similar capability-sourcing objectives, they differ in their capacities to cope with constraints that stem from firms’ existing stock of capabilities and in their internal social institutions, such as incentive systems and social values. Internal development offers an effective way of developing new capabilities that complement firms’ existing capabilities (Penrose 1959, Helfat 1994) and are compatible with their internal social context (Nelson and Winter 1982, Scott 1987). In contrast, external sourcing may provide a more effective way of acquiring capabilities that are more distant from the firm’s capabilities (Rosenkopf and Nerkar 2001) or create internal friction (Menon and Pfeffer 2003). We expect that firms that appropriately assess both constraints created by their existing stock of capabilities and those that stem from their internal social context will be more effective at developing new capabilities when choosing between internal development and external sourcing and that they will survive longer than firms that do not take those constraints into account.

We test our arguments with data from the international telecommunications industry from 2000 to 2005. The sector provides a rich setting to study how firms acquire new capabilities in the face of rapid industry changes, including deregulation, price competition, technological convergence, and entry of foreign competitors (Williams and Mitchell 2004). Institutional changes such as deregulation reset an industry’s competitive clock (Delmas and Tokat 2005, Walker et al. 2002). Both established telecommunications firms and industry newcomers faced the substantial need to acquire new capabilities that would suit the changing environment (Chen et al. 2006).

The study uses three sets of data. While developing our conceptual arguments, we conducted 26 interviews with knowledgeable executives to understand what type of capabilities firms needed to develop to survive in their fast-changing environment and how they closed their capability gaps; quotes from the interviews illustrate our arguments. We then conducted a large-scale survey of telecommunications firms operating throughout the world to assess firms’ criteria for choosing among capability-sourcing modes and the initial success of their capability-development activities. We followed up by collecting survival data for the respondent firms during the five years after the survey.

Internal and External Modes of Closing Capability Gaps

Capabilities and Capability Gaps

Following Amit and Schoemaker (1993, p. 35), we define resources as stocks of factors that a firm controls and capabilities as the firm’s capacity to deploy resources for a desired end result. Capabilities are tangible or intangible processes that develop through interactions with the firm’s resources. Hence, to obtain new capabilities, firms commonly also need to obtain new stocks of resources as well as the skills required to deploy the resources. Examples of capabilities in our empirical setting include research capabilities, information technology capabilities, engineering know-how, commercial responsiveness, project management skills, and network management expertise.

We define capability gaps in terms of distance between needed capabilities and the firm’s existing capability base. That is, a capability gap is the set of resources that a firm would need to obtain and deploy to compete in a particular competitive setting (Helfat and Lieberman 2002).

Capability gaps include two dimensions: closeness and strength. A firm faces a small capability gap when its current capabilities are similar to needed capabilities in terms of relevant technical and organizational dimensions (capability closeness) and when the firm already possesses a strong position in the targeted capability area relative to its competitors (capability strength). Firms face their most serious capability gaps when their existing capabilities are dissimilar from needed capabilities (capability distance) and when a firm has only limited strengths in the targeted capability area relative to competitors (capability weakness). Capability strength/weakness is relevant in addition to capability closeness/distance because the firm’s needed and existing capabilities may arise from common technology and organizational processes, yet the firm’s current capabilities may not be strong enough relative to competitors’ to develop an effective set of capabilities. That is, although capability distance and weakness tend to track together, they are not necessarily conjoint issues.

The following examples illustrate the ideas of capability distance and capability weakness. Telecom firms that lacked existing customer service businesses faced capability distance gaps when they faced market pressures to be more responsive to their core consumers, because the new marketing skills required very different organizational processes. In addition, many European telecom incumbents faced capability weakness gaps with respect to data transmission technologies, where they trailed stronger competitors in the United States that had extensive digital telecommunications experience.

Firms face smaller capability gaps when either capability distance or strength is an issue, but not both. In
such off-diagonal cases, we would expect capability gaps to have more moderate, but still meaningful, influences on the sourcing mode choices that we describe later in the paper. Prior research has discussed capability gaps in terms of patents and industry categories, but little research addresses multidimensional gaps in technical and organizational capabilities.

Our discussions with executives showed that both established firms and industry newcomers faced substantial gaps between their existing capabilities and those they needed to compete in the changing competitive environment. On the one hand, deregulation and development of data technologies placed incumbent public telephone organizations (PTOs), such as KPN, British Telecom, France Télécom, Telefonica, Telia, and Deutsche Telekom, at a disadvantage in key capability areas. Incumbents had weak marketing capabilities (e.g., limited ability to manage pricing schemes, analyze traffic, and coordinate corporate accounts) because they traditionally faced limited competition. In the technological area, incumbents had developed strong skills for operating voice transmission networks but had weak capabilities in digital data transmission and data management. On the other hand, new firms and diversifying entrants from markets such as mobile telephony, cable, and data communications (e.g., Global Crossing, Level 3, and Mobilcom) typically had more flexibility than the established PTOs but often lacked customer bases, reputation, and critical size. In our fieldwork, as the following quotes illustrate, executives referred to capability gaps between traditional circuit technology for voice traffic and new packet technology for data traffic. They also cited marketing capability gaps stemming from the traditional low marketing sophistication of PTOs and the emergence of aggressive new competitors.

There is a huge gap between the skills we need to deliver an integrated offering in the ICT [information and communication technology] business and our current competencies. To deliver such an integrated portfolio, we need 80% information technology competencies versus 20% traditional telecom competencies.

Our current skills are based on traditional specialized engineering skills, while we are looking for engineers with a general view of network architecture and with broader responsibility. We also need sales and marketing people more specialized in Internet and carrier products.

This paper views capability-development choices as reflecting at least boundedly rational activity (Dosi et al. 2000, Helfat and Lieberman 2002). We assume that managers are aware of the gaps between their existing capabilities and the capabilities they need to compete successfully in their industries and that they deliberately attempt to take action to close the gaps.

Internal Development vs. External Sourcing for Obtaining New Capabilities

We distinguish between two modes of obtaining new capabilities: internal development and external sourcing. Internal development refers to creating a new capability within the existing boundaries of a firm by recombining the firm’s existing capabilities or creating new ones. Examples of internal development include internal training, internal product development, opening new R&D labs, and hiring new staff members. External sourcing means trading in a strategic capability that stems from external sources. Trading in a strategic capability can occur by three means (Chi 1994): purchase contracts, alliances, and acquisitions. Purchase contracts are cases in which firms buy distinct capabilities, such as off-the-shelf technologies and services, from third parties. Alliances are ongoing relationships among distinct organizations that retain strategic autonomy but agree to work together for a period of time, for example, in equity and nonequity joint ventures or R&D and marketing partnerships. Acquisitions involve obtaining majority control of other entities, including acquiring entire corporations and purchasing individual businesses from ongoing corporations.

Internal development offers advantages and disadvantages. External sourcing often raises appropriation concerns because of difficulties in screening and transferring capabilities into the firm (Williamson 1975), thereby creating incentives for internal sourcing to protect the value of the capabilities (Teece 1986, Gulati and Singh 1998). When a targeted capability has a high value to the firm, internal sourcing provides stronger safeguards to protect its value and prevent leakage (Chi 1994). Several empirical studies support the argument that fear of capability leakage leads to greater use of internal sourcing (e.g., Monteverde and Teece 1982, Pisano 1990), notably when firms lack the skills to govern external exchanges (Kale et al. 2002, Mayer and Argyres 2004, Zollo and Singh 2004). Internal sourcing also allows a firm to coordinate activities needed to build on its existing capability stock (Kogut and Zander 1996). The firm can use internal development to increase the specificity of the capabilities and to establish systemic interdependencies among capabilities (Dierickx and Cool 1989). Internally developed capabilities can thus provide a more stable platform for future development of new capabilities than those acquired externally, because of their greater integration into the firm’s context and knowledge base (Grant 1996, Karim and Mitchell 2000).

Yet a firm’s internal development activities may constrain the development of truly innovative resources (Reed and DeFillippi 1990). Internal development is constricted by the firm’s existing capability endowments (Winter 1990). Several studies examine how historical capability endowments affect a firm’s propensity to

To overcome the limitations associated with internal development, firms may need to resort to external sourcing to enter new capability domains (Stuart and Podolny 1996, Rosenkopf and Nerkar 2001). The choice between internal and external acquisition of new capabilities parallels the spectrum that spans from exploitation to exploration (Vermeulen and Barkema 2001). Internal development is commonly associated with local search (exploitation), as a firm’s internal development of new capabilities has technological and geographic boundaries (Helfat 1994, Stuart and Podolny 1996). Further exploitation and internal development may reinforce existing skills but may also lead to oppressive conformity, blindness, and competency traps (Miller 1993). In contrast, external growth is commonly associated with more distant search (exploration) and helps capability-seeking firms overcome the constraints associated with contextually localized internal search (Rosenkopf and Almeida 2003). External sources such as acquisitions and alliances may help unfreeze mental maps, structures, and processes (Singh and Mitchell 2005).

A quote from our interviews illustrates how one firm assessed its capability needs and the organizational capacities of its internal organization, compared with its external sourcing options.

The first question we ask once we have identified our resource gap, and to make our decision on whether we should we do it by ourselves, is “How far is it from our current skills?” And then we ask: “How fast? How easy is it to acquire those skills compared to training? How much of these skills exist on the labor market? Or if not, can we acquire firms? How costly it is? What is the impact of the imported skills on our internal skills, our people? How do you balance that with our internal people and context?”

The following section discusses how constraints stemming from capability gaps and internal institutions influence the choice of mode for acquiring new capabilities. Capability constraints arise from the lack of capabilities within the firm that are necessary to pursue the development of needed capabilities. Internal social constraints arise when internal friction inhibits internal development of capabilities.

### Internal Development vs. External Sourcing: Contingency Factors

**Taking Capability Constraints into Account**

Several literatures are relevant for discussing capability constraints. The resource-based view posits that a firm’s specific capabilities determine the range of strategic options that it can use to create new capabilities (Penrose 1959). Helfat and Lieberman (2002, p. 753) argue that capability gaps affect the likelihood, speed, and mode of market entry. In particular, they argue, “firms appear to take account not only of the resources they have (and seek to leverage through market entry), but also of gaps between their pre-entry resources and those required for entry.” In sum, firms need to assess the gap between their existing capabilities and the targeted capabilities, that is, whether strategically important internal capabilities are unavailable or inadequate to support the development of needed capabilities.

When a capability gap is small, a firm can typically make the effort to develop the targeted capabilities internally (Leonard 1995). In their analysis of studies that examine market entry, Helfat and Lieberman (2002, p. 747) stress that “firms tend to enter by internal growth when their specialized pre-entry resources, such as marketing and technological resources, as well as local market knowledge, have greater similarity to the required resource profiles in the markets of entry.” When it is feasible, firms prefer to rely on internal development based on their historically developed capabilities. As noted earlier, internally developed capabilities often have both coordination and protection benefits (Liebeskind 1996). Conversely, when the capability gap is large, it is often appropriate to seek new capabilities from outside the firm (Penrose 1959, Cuervo-Cazurra 1999).

Empirical studies show that firms tend to use internal development of technical capabilities in areas closely related to their existing technological capabilities (Helfat 1994, Tripsas and Gavetti 2000). Technological capabilities often involve tacitness, complex organizational processes, and social complexity that require linkages with other functions of the firm such as sales and marketing (Teece 1986, Winter 1990). Such linkages may prevent firms from developing truly innovative technological capabilities through internal development (Henderson and Clark 1990). In their study on the development of technological variation among Japanese semiconductor companies, Stuart and Podolny (1996) found that the propensity of a firm to form alliances increased with the degree to which it innovated in new technical fields. Similarly, in their study of patenting activity in the optical disk industry, Rosenkopf and Nerkar (2001) found that exploration that did not span firm boundaries had a lower impact on subsequent technological evolution.

Similarly, internal development may not suit developing radically new marketing capabilities. Marketing capabilities, such as brand names and sales networks, often
embody complex incentive mechanisms and tacit knowledge about the competitive environment (Anderson and Schimittelein 1984, Dierickx and Cool 1989). Thus, marketing capabilities often lose value when redeployed outside their initial market. Consequently, when dramatic changes in a competitive context create needs for substantially new marketing capabilities, firms may need to acquire capabilities from external sources.

A quote from our fieldwork illustrates the idea that firms need to learn to assess capability constraints when choosing between internal development and external sourcing.

“We went for a long time for internal R&D, but we did not have these competencies. Then we tried to bring these competencies through alliances. Now we do acquisitions to speed up R&D. There is a pattern. We realized that we needed to reach a certain threshold of competencies before we could run effective internal development.”

In parallel with resource-based arguments, the knowledge-based perspective on strategy emphasizes organizational factors that orient firms toward developing new capabilities that relate closely to their existing capabilities. As a result, a firm’s search process for new capabilities is often local, in the sense that a firm commonly searches in the neighborhood of its current technological position (Nelson and Winter 1982, Dosi 1982). Cohen and Levinthal (1990) argue that firms tend to undertake internal changes that build on their existing ability to evaluate and utilize particular knowledge, which they refer to as absorptive capacity. As the firm moves away from its technological and marketing capability base, its probability of success resembles, at best, that of a start-up operation (Kogut and Zander 1992). The firm may even consider abandoning the development of the targeted capabilities if the gap is too large. One alternative to abandonment is to search outside the firm and attempt to import external capabilities that the firm could not have created with its existing internal capabilities. Kogut (1991) argues that firms use internal development for projects that build on related capabilities and, by contrast, rely on joint ventures or acquisitions when the capabilities are distantly related.

In line with the resource-based and knowledge-based arguments, the diversification literature examines the relationship between a firm’s capability endowments and mode of market entry (for a review, see Helfat and Lieberman 2002). An entrant with a high degree of relatedness to a market favors direct entry (Yip 1982, Chatterjee 1990), as does an entrant that expects a large reduction in operating costs from excess capabilities and requires few complementary capabilities (Teece 1986, Chatterjee 1990). Empirical studies in the foreign direct investment literature generally support this pattern, showing that, as firms enter new lines of business in foreign markets, they prefer joint ventures or acquisitions to greenfield investment (Hennart and Park 1993). Similarly, Barkema and Vermeulen (1998) found that firms that expanded abroad into related industries were more likely to set up new ventures than firms that expanded into unrelated businesses, which tended to acquire existing firms.

In turn, the literature on acquisitions and alliances shows that external sourcing facilitates technological and commercial renewal by exposing the firm to new technological domains, product environments, and geographic markets (Carow et al. 2004, Krishnan et al. 2004). Empirical studies show that managers often search for targets or allies with strong capabilities that complement the acquirer’s weaknesses, with a view to redeploying the stronger capabilities from the target (Capron 1999, Capron et al. 1998) or use the ally’s strength (Dussauge et al. 2000). Examining the product line evolution of firms in the U.S. medical equipment sector, for instance, Karim and Mitchell (2000) find that acquisitions provide opportunities for undertaking path-breaking changes by seeking targets that offer capabilities that differ markedly from a firm’s existing skills. They also find that acquirers are more likely than nonacquirers to possess capabilities that have only recently entered the industry, suggesting that firms that use internal development are more likely to pursue path-dependent changes than path-breaking changes. Through acquisitions, firms both acquire unfamiliar new capabilities and learn how to use their existing capabilities in new organizational settings and under competitive conditions (Mitchell 1994, Capron and Pistre 2002, Zollo and Singh 2004).

In sum, external sourcing offers opportunities for firms to overcome their capability deficiencies, allowing more distant search and much faster capability reconfiguration than internal development.

**Hypothesis 1.** Firms that internally develop (externally source) new capabilities when there is a small (large) capability gap will be more effective in obtaining new capabilities and, in turn, will survive longer.

**Taking Internal Social Constraints into Account**

Complementing the resource-based and knowledge-based perspectives, which focus on how capability constraints shape firms’ sourcing choices, evolutionary and institutional theories emphasize the role of institutional factors within the firm as enabling factors for capability development. Internal institutions are the sets of systems and values that exist within a firm’s internal social context (DiMaggio and Powell 1983, Scott 1987). We will use the term *internal social constraints* to refer to barriers that arise from the existing social context within a firm.

The evolutionary argument stresses that a firm’s irreversible investments and limited range of operating routines constrain its ability to develop and use capabilities within the firm. Firms tend to develop proximate capabilities that do not disrupt their existing routines and
processes, thereby maintaining the social fabric that weaves together the firm’s capabilities (Cyert and March 1963). Therefore, switching to new capabilities is difficult, because a firm only partially understands the social knowledge embedded in its current capabilities, and it is often unclear what social fabric would be required to support the new learning (Kogut and Zander 1992). Indeed, the very stability of this social fabric within existing relationships generates valuable firm-specific capabilities.

Prevailing routines act as a truce in intraorganizational conflict (Nelson and Winter 1982, p. 107), and attempts to change routines often provoke a renewal of the conflict, which can be destructive to the individual participants and to the organization as a whole. The fear of breaking the truce is a powerful force that tends to hold organizations on relatively inflexible paths. Substantial local changes imply extensive changes in routines throughout the rest of the organization. When possible, a firm will try to target capabilities with features that will allow its existing routines to function smoothly, in order to maintain the truce that existing routines represent. Thus, the social context in which resource transformation occurs within a firm influences the social acceptance of the targeted resources and capabilities.

Institutional theory suggests that the firm’s institutional context, and notably the social legitimacy and political acceptance of its capabilities, is key to capability, sourcing decisions (Scott 1987). From this perspective, firms operate within a social framework of norms, values, and taken-for-granted assumptions about what constitutes appropriate or acceptable economic behavior (DiMaggio and Powell 1983). Institutional factors surrounding capability decisions constrain the potential of firms to develop new capabilities (Ginsberg 1994). Firms are more likely to use internal development for new capabilities that are socially accepted. Internal development of new capabilities that build on new routines meets institutional barriers. As Oliver (1997, p. 701) notes,

> Whereas knowledge-based theorists assume that managers make rational choices bounded by uncertainty, information limitations, and heuristic bias, institutional theorists assume that managers commonly make irrational choices bounded by social judgment, historical limitations, and the inertial force of habit.

As well as disrupting systems, attempts to develop capabilities that depart from a firm’s values often face resistance from members of the organization. Creating capabilities that will compete with the firm’s existing capabilities often triggers resistance, even when those changes are economically desirable. Individuals may be reluctant to switch to less-familiar practices (Oliver 1997) and may perceive the new capabilities as departing from norms and values (Scott 1987) or as challenging their status and power (Ocasio 1997). Indeed, in theory, targeted capabilities might be close to an organization’s existing capabilities, but, in practice, entrenched individuals or top management teams may not be able to shift their attention to the new capability area (Cho and Hambrick 2006). They may even shun the development of new capabilities to preserve existing values and retain their power, notably when the changes would reduce the value of existing capabilities. A quote from our fieldwork illustrates this point.

In many telecom incumbents, the data traffic department used to be a marginal subsidiary compared to the powerful voice traffic department ruled by circuit technology engineers. The boom in data traffic has raised internal political problems due to the vested interest of the people in place. In some firms, investments and resource allocations toward data technologies have been postponed or limited due to this internal competition.

Avoiding conflict may help maintain a social truce within a firm, but it will place it on rigid trajectories if the firm does not find alternative means of obtaining new capabilities. As Powell and Smith-Doerr (1994, p. 393) posit, the “ties that bind may become the ties that blind.” Shared identity and social ties within a firm may create biases toward continuing patterns of capability development that focus on existing knowledge and preserve vested interests, while preventing the firm from searching for new knowledge that would challenge people’s background and status.

The notion of internal social constraints complements the earlier discussion of capability constraints. It involves nonrational, behavioral components of the firm’s capacity to develop new capabilities internally. It closely parallels the notion (Abernathy and Clark 1985, Tushman and Anderson 1986) of competence destruction, which arises when potential new capabilities will reduce the value of existing capabilities. The base argument concerning competence destruction is that firms tend to avoid changes that involve substantial competence destruction. An extension of the argument is that the presence of competence destruction will influence the modes that firms use to attempt to change despite the potential for competence destruction.

External sourcing of capabilities that would disrupt the firm’s existing internal social context during internal development provides a means of overcoming barriers to developing needed capabilities. Whereas internal players seeking to protect status and power may shun the use of new capabilities regardless of the source, and thus may strongly resist attempts to bring in and build on outside knowledge, the firm will have less immediate need to attempt to adjust existing capabilities in the face of substantial internal conflict. By using external sourcing, firms may avoid major disruption within the existing organization (at least during the earlier part of the process of capability development), thereby circumventing the hurdles brought by entrenched individuals, notably if they separate the newly acquired capabilities from
the existing structure. Only later can the firm undertake the process of integrating the acquired capabilities within the firm and adjusting existing capabilities, once the presence of the new capabilities has become a fait accompli or when market pressures (notably in the case of acquisitions) provide momentum for firms to integrate acquired capabilities and deliver synergies. Furthermore, externally sourced capabilities can be less threatening to individuals within the firm than internally developed capabilities. For instance, Menon and Pfeffer (2003) found in several case studies that managers tended to view external knowledge more favorably than internal knowledge when the targeted capabilities posed status threats for insiders.

In sum, we expect that firms benefit when they use internal development for capabilities that fit with their existing internal social context and turn to external sourcing for capabilities that face social rejection.

**Hypothesis 2.** Firms that internally develop (externally source) new capabilities when the needed capabilities fit (conflict) with their existing social context will be more effective in obtaining new capabilities and, in turn, will survive longer.

Although external sourcing may provide a solution when capability gaps are large or internal friction is severe, several limits arise. First, external sourcing may fail if the capability gap is particularly large. Absorptive capacity logic (Cohen and Levinthal 1990) suggests that a firm needs some level of related internal knowledge to be able to recognize, obtain, and build on external knowledge. Second, firms may decide to stop the search process when a gap is too great. Third, in a newly emerging technological field or market, external sources may be inadequate, because other firms may not yet have developed the needed capabilities. Last, firms vary in their ability to reconfigure internal and external resources (Helfat and Peteraf 2003, Zollo and Singh 2004). Because reconfiguration skills might grow with experience, the analyses will control experience in internal development and external sourcing.

**Data and Methods**

**Data Collection and Sample**

The research developed over three stages. We first conducted a qualitative study to learn about firms’ capability gaps, their use of different capability-sourcing modes, and their criteria for choosing between internal development and external sourcing. We next developed and conducted a survey of telecommunications firms located around the world. We then collected survival data to assess the extent to which the firms that participated in our survey survived in the following years.

The fieldwork included 26 interviews that helped refine our predictions, formulate questions that were relevant to managers, and develop the survey instrument. In the early stage of our fieldwork, we conducted 11 open-ended interviews to gather information on the industry, the types of capabilities that firms were seeking, and the way they filled their capability gaps. We began with the following questions:

What changes in your environment are you facing?  
What type of new competencies and skills do you need to adjust to these changes in your environment?

How do you intend to acquire those needed skills? Each interviewee then discussed the modes of acquiring new capabilities that his or her firm used. We gained access to senior executives through an Executive Education Telecom program at a leading European business school. The interviews, which lasted for one to two hours, drew on a diverse set of managers. We interviewed people who worked for telecom incumbents such as France Télécom, British Telecom, and KPN, as well as newcomers such as Enertel. The executives held positions in areas such as purchasing, marketing, finance, customer service, and data engineering and in businesses such as mobile, data, and fixed lines. We also interviewed a partner at McKinsey who had substantial telecom expertise.

We then conducted eight on-site interviews with managers who held high-level positions in their firms. These included general managers of ICT, E-business, leased line, voice over internet protocol, and innovation businesses. The interviews, which lasted between two and three hours, had three parts. Managers first outlined capabilities they needed to survive in the telecom industry. They next described how they intended to fill the capability gaps and what criteria they used to choose among the different modes for sourcing new capabilities. Typical questions in this part were, “How do you manage the capability gap?” and “When do you decide to go externally rather than doing it by yourself?” With managers whose firms had been involved in recent acquisitions, we asked, “Why did you make these recent acquisitions?” “Why did your firm use acquisitions rather than internal development via an alliance or a market exchange?” and “Was it an effective way of obtaining the needed capabilities?” Finally, the managers reported stresses associated with the modes they chose. Questions in this part included, “How effective has this acquisition (or alliance, market exchange, internal development) been in building the needed skills?” and “What have been the challenges and pressures for your firm associated with this acquisition (or alliance, market exchange, internal development)?” We asked follow-up questions when the people identified issues associated with specific modes. The onsite interviews allowed a rich interaction with people at the firms, as the executives introduced us to colleagues to provide documents and sources for follow-up questions.

We concluded the qualitative data collection by conducting a research workshop with seven senior managers from telecom and technology-related firms to explore our framework and items. The executives received the
assignment as a group to provide feedback on our framework and to brainstorm about complementary influences on the choice of modes of acquiring new capabilities.

Second, we collected survey data from telecommunications firms based in Europe, North America, South America, and Asia to determine the criteria and outcome of the firms’ efforts to create new capabilities. The survey identified the firms’ efforts to assess the nature of their capability gaps, their use of the various capability-sourcing modes, and their criteria for choosing between internal development and external sourcing. We pretested the survey with senior North American and European executives from diverse backgrounds. We pilot-tested the revised survey instrument with onsite interviews with other senior executives, leading to the final version of the questionnaire. We designed and administered the mail survey following Dillman’s (1978) Total Design method.

We used two sources for respondents. During late 2000 and early 2001, we mailed the survey to about 1,500 senior managers (40% in Europe, 40% in the United States, and the remainder distributed throughout the world; we did not send the survey to the executives we interviewed during the initial fieldwork). All respondents held positions equivalent to vice president or above in general management areas such as corporate development. We sent two follow-up letters and two replacement questionnaires within the three weeks following the first mailing. We also administered the survey to 90 senior managers from telecommunications firms that were participating in executive education programs. We obtained 135 responses to the mail survey, which is a reasonable number given the seniority of the respondents and the detailed nature of the questionnaire. In addition, 27 of the executive education participants mailed back their responses. In total, our data include 162 telecommunications firms.

Third, we collected survival data on the respondent firms. We assessed whether the firms continued to operate in 2005, five years after the survey. We were able to identify the current status of 153 of the 162 responding firms, as we describe below.

Performance Variables
One performance variable measures the effectiveness of firms’ attempts to obtain new capabilities ($\eta_1$). To do this, we asked respondents to assess the effectiveness of their firms in creating new capabilities compared with that of their main competitors, in three capability areas: (1) R&D capabilities, (2) information technology capabilities, and (3) marketing capabilities (customer knowledge, branding, and pricing). The three items use a seven-point scale, with 1 for “behind competition” and 7 for “ahead of competition.” We use this variable as a mediating variable in the analysis of survival, which is the ultimate dependent variable in the study.

The survival variable ($\eta_2$) denotes whether the responding firms continued to operate in 2005, five years after the survey. We were able to identify the current status of 153 of the responding firms: 93 (61%) survived, 35 (23%) shut down, and 25 (16%) were acquired (most or all acquisitions involved targets that were struggling, rather than successful firms that had reached the limits of their growth). We created a dependent variable that took the value of 1 for dissolved firms, 2 for acquired firms, and 3 for surviving firms. Although both dissolved and acquired firms typically were troubled firms, we maintained the distinction between those two outcomes because acquisition does not necessarily represent a negative economic outcome.

Independent Variables
We asked the respondents to assess the use and motivation of internal development and external sourcing projects that they had conducted over the three to five years prior to the survey. This approach seeks to identify firmwide patterns in capability-development activities and avoids the selection bias that would arise if respondents focused on a single, self-selected decision. The approach forces respondents to think about all the projects that they undertook, not just the most successful or most recent projects.

The survey provided two measures for capability gaps and two measures that addressed how internal social frictions influenced firms’ decision to select internal sourcing. The first independent variable ($\xi_1$) measures the extent to which respondents assessed the gap between their existing technical capabilities and targeted technical capabilities. For example, we asked managers to rate on a seven-point scale (1 = fully disagree, 7 = fully agree) their agreement with the following statement: “In the past 3 to 5 years, we used internal development rather than external modes when our existing technical capabilities were close to the needed technical capabilities.” We used two items to construct the first independent variable. These items report the extent to which respondents preferred internal development over external sourcing when their existing technical capabilities were close to the needed capabilities (capability closeness, item 1) and when they had a strong competitive position in the technical area (capability strength, item 2). The $\alpha$-Cronbach for $\xi_1$ is 0.74.

The second independent variable ($\xi_2$) measures the extent to which respondents assessed the gap between the targeted marketing capabilities and their existing marketing capabilities when they selected internal over external sourcing. We used three items to construct this variable. These items report the respondents’ assessment of the extent to which they preferred internal development to external sourcing when their existing marketing capabilities were close to the needed capabilities (capability closeness, item 1), when they had a strong competitive position in the marketing area (capability strength,
item 2), and when they already knew the customers in the targeted capability area (capability strength, item 3). The $\alpha$-Cronbach for $\xi_2$ is 0.77.

The third independent variable ($\xi_3$) measures the extent to which respondents assessed the fit of targeted capabilities with their existing social systems when they selected internal or external sourcing. Three items report the respondents’ assessments of the extent to which they preferred internal development to external sourcing when the needed capabilities fit their firm’s system of incentives and culture (item 1), when the firm’s system of incentives suited hiring the needed people (item 2), and when their firm had systems in place to integrate newly hired people (item 3). The $\alpha$-Cronbach for $\xi_3$ is 0.71.

The fourth independent variable ($\xi_4$) measures the extent to which people within the firm would accept targeted capabilities. The two items for this variable report the respondents’ assessments of the extent to which they preferred internal development to external sourcing when the needed capabilities triggered little or no internal competition (item 1) or created little or no internal resistance (item 2). $\alpha$-Cronbach for $\xi_4$ is 0.81.

**Control Variables**

We assessed several other factors that might influence the firm’s success.

**Size.** Size confers both greater status and greater opportunity for cultivating outside options and thereby influences the likelihood that a firm will survive (Uzzi 1996). Size affects patterns of interorganizational social exchanges because of its direct association with status and power; larger firms may find it more difficult to change successfully because of higher inertia than smaller firms. We measured firm size using a five-point scale based on the number of employees worldwide (1 for firms that have fewer than 200 employees, 5 for firms that have more than 5,000 employees).

**Age.** Young firms often lack resources and capabilities needed to withstand a sustained period of poor performance (Levinthal 1991). They also lack skills to search for, select, price, and integrate alliance and acquisition partners. We measure firms’ age using a five-point scale (1 for firms that are younger than two years, 5 for firms that are older than 20 years).

**International Scope.** The geographic diversity of the acquirer’s activities can help screen and integrate capabilities from different environments (Bartlett and Ghoshal 1989). Firms that span several geographic settings develop stronger capabilities for managing complex information-processing and decision-making requirements. We used a three-point variable to measure the firm’s international scope: domestic (1), regional (2), and global (3).

**Profitability.** Profitable firms typically have strong capabilities that they can use for internal development activities. Profitability also provides bargaining power and makes the firm more attractive to alliance partners and acquisition candidates. We used a five-point scale to assess the firm’s return on equity (1 equal to an ROE less than 5%, 5 equal to an ROE above 20%).

**R&D and Advertising Investments.** A firm’s investment in key resources can enable its internal development of new capabilities, as well as help screen and absorb external knowledge. Building on the measure of Morck and Yeung (1992), we calculated the firm’s investment in R&D compared to its sales with a five-point scale (1 for firms that spend less than 2% of their sales on R&D, 5 for firms that spend more than 15%).

We developed a similar measure for the firm’s advertising investments.

**Dependence on Regulation.** Telecommunications firms often deploy regulatory strategies to shape the political environment (Bonardi et al. 2005). We used a five-point scale to measure the extent to which the firm depends on regulation (1 for “not at all,” 5 for “to a very large extent”).

**Ownership Structure.** We expect government-linked firms to be better protected from competitive pressures and thus more likely to survive in their environment compared to their privately owned and stock-listed peers. We used two dummy variables: one with a value of 1 when the firm is privately held and a second with a value of 1 when the firm is stock listed (the baseline is when the firm is state owned).

Table 1 provides descriptive statistics for the variables.

**Assessing Potential Sampling and Method Biases**

Our use of managerial judgments is consistent with our conceptual framing. Firms’ choices between internal and external sourcing depend on their managers’ assessment of their capability constraints and internal social constraints rather than on more objective measures of these concerns. The respondents were senior executives with high-level responsibilities and knowledge of their firms’ decision-making processes, who could reflect on the composition of their firm’s capability-development projects. While a single executive rarely makes all sourcing decisions, our fieldwork indicates that senior executives have sufficient perspective to recognize their firm’s decision rules in capability-sourcing activities.

The study design has several limitations. As with any survey, concerns about retrospective data collection arise. Research indicates that memory degrades exponentially with time (Sudman and Bradburn 1973). Furthermore, top managers often attempt to cast past behaviors and outcomes in a desirable light, especially when they have a reputational or emotional investment in such outcomes (Golden 1992), which may induce ex post rationalizations and/or desirability biases.

Several steps helped reduce the biases. We examined differences between respondents and nonrespondents to
<table>
<thead>
<tr>
<th></th>
<th>Scale</th>
<th>Mean</th>
<th>Std dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1–7</td>
<td>4.99</td>
<td>1.41</td>
</tr>
<tr>
<td>2.</td>
<td>1–7</td>
<td>5.17</td>
<td>1.44</td>
</tr>
<tr>
<td>3.</td>
<td>1–7</td>
<td>4.35</td>
<td>1.43</td>
</tr>
<tr>
<td>4.</td>
<td>1–7</td>
<td>4.48</td>
<td>1.65</td>
</tr>
<tr>
<td>5.</td>
<td>1–7</td>
<td>5.36</td>
<td>1.24</td>
</tr>
<tr>
<td>6.</td>
<td>1–7</td>
<td>4.64</td>
<td>1.47</td>
</tr>
<tr>
<td>7.</td>
<td>1–7</td>
<td>4.41</td>
<td>1.58</td>
</tr>
<tr>
<td>8.</td>
<td>1–7</td>
<td>4.78</td>
<td>1.48</td>
</tr>
<tr>
<td>9.</td>
<td>1–7</td>
<td>4.63</td>
<td>1.43</td>
</tr>
<tr>
<td>10.</td>
<td>1–5</td>
<td>3.41</td>
<td>1.59</td>
</tr>
<tr>
<td>11.</td>
<td>1–5</td>
<td>3.96</td>
<td>1.20</td>
</tr>
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<td>12.</td>
<td>1–3</td>
<td>2.07</td>
<td>0.88</td>
</tr>
<tr>
<td>13.</td>
<td>1–5</td>
<td>2.68</td>
<td>1.38</td>
</tr>
<tr>
<td>14.</td>
<td>1–5</td>
<td>2.14</td>
<td>1.16</td>
</tr>
<tr>
<td>15.</td>
<td>1–5</td>
<td>3.08</td>
<td>1.67</td>
</tr>
<tr>
<td>16.</td>
<td>0/1</td>
<td>0.47</td>
<td>0.50</td>
</tr>
<tr>
<td>17.</td>
<td>0/1</td>
<td>0.49</td>
<td>0.50</td>
</tr>
<tr>
<td>18.</td>
<td>1–5</td>
<td>3.45</td>
<td>0.97</td>
</tr>
<tr>
<td>19.</td>
<td>0/1</td>
<td>0.52</td>
<td>0.50</td>
</tr>
<tr>
<td>20.</td>
<td>0/1</td>
<td>0.39</td>
<td>0.29</td>
</tr>
<tr>
<td>21.</td>
<td>1–7</td>
<td>4.64</td>
<td>1.89</td>
</tr>
<tr>
<td>22.</td>
<td>1–7</td>
<td>4.30</td>
<td>1.31</td>
</tr>
<tr>
<td>23.</td>
<td>1–7</td>
<td>4.37</td>
<td>1.41</td>
</tr>
<tr>
<td>24.</td>
<td>1–3</td>
<td>2.38</td>
<td>0.84</td>
</tr>
<tr>
<td>25.</td>
<td>1–7</td>
<td>4.48</td>
<td>1.43</td>
</tr>
</tbody>
</table>

**Table 1 Descriptive Statistics**
establish whether sampling bias was a problem. We found no significant differences in the financial and economic profile of 27 respondents and 63 nonrespondents who received the surveys during executive education programs. Similarly, we found no significant differences among the 27 executive education responses and the other responses. Nor did we find significant differences in the profitability of respondents and nonrespondents among public firms in the sample or among early and late respondents (Armstrong and Overton 1977).

We generated a rich corpus of measurement scales based on the literature and the interviews. The survey contained multiple items for each construct, distributed throughout each section to avoid consistency bias. We introduced control questions at various points. We deleted the few cases that exhibited a lack of convergence across similar questions. To address possible response-style biases (e.g., yea saying), we introduced items that were heterogeneous in content and worded some items positively and others negatively (Baumgartner and Steenkamp 2001).

Several steps assessed common method biases. To check whether common methods for the independent variables ($\xi_1, \xi_2, \xi_3, \xi_4$) and the mediating variable ($\eta_1$) influenced the results, we followed the unmeasured latent variable approach from Podsakoff et al. (2003). In the following structural models, we added a single unmeasured latent factor with the observed measures as indicators to a measurement model containing all measured items and their corresponding latent constructs. This approach separates trait effects from method effects and random effects. The analysis found no systematic variance among the items, and adding the first-order factor produced low parameter estimates for its indicators. These results suggest that using the questionnaire for the variables did not seriously bias the results. Furthermore, we conducted a Harman one-factor test on the items in the analysis. The factor analysis extracted four factors, with the first factor accounting for 23% of the variance. Because no single dominating factor emerged, common method variance was unlikely to be a serious problem (Podsakoff and Organ 1986). We also placed questions concerning antecedents and outcomes at various points in the survey—this limited the chance that answers to one set of questions would determine answers to later questions and reduced the possibility that the respondents’ implicit theories about reasons for selecting a mode would influence how they answered performance questions. Finally, we used objective data to measure firm survival.

**Structural Model**

We used structural modeling methods to estimate our model. Structural modeling addresses structural and measurement issues that are frequent in survey-designed research. This method suits the hypothesized model because of its ability to consider multiple regressions simultaneously for the analysis of direct, indirect, and spurious relationships; estimate models with latent variables; estimate the loadings of each observed variable in the context of the full model rather than in isolation; accommodate measurement errors in both dependent and independent variables; accommodate reciprocal causation, simultaneity, and interdependence; and account for correlations among error terms (Bollen 1989). We used AMOS 4.0 (Arbuckle 2002), which belongs to the second generation of the multivariate analysis family of techniques such as LISREL.

Estimation of the structural equation model comprises two parts. An inner structural model captures the relationship between the endogenous and exogenous latent variables. An outer measurement model estimates latent variables in terms of observable measures. The structural and measurement models used a full information maximum likelihood estimator.

The inner structural model specifies the relations among the theoretical constructs (latent variables) and is written as $\eta = \beta_1 y_1 + \Gamma \xi + \zeta$, where $\eta$ is a $(m \times 1)$ vector of endogenous latent variables, $\xi$ is a $(n \times 1)$ vector of exogenous latent variables, $\beta$ is a $(m \times m)$ matrix of endogenous variable coefficients, $\Gamma$ is a $(m \times n)$ matrix of exogenous variable coefficients, and $\zeta$ is a $(m \times 1)$ vector of residuals. The latent endogenous variable in this model is firm survival ($\eta_1$). The control variables and the four measures that assess the extent to which firms evaluate capability and internal social constraints when forming portfolios of internal and external sourcing projects are latent exogenous variables ($\xi$). The mediating performance variable is the firm’s effectiveness in creating new capabilities ($\eta_1$).

The outer measurement model is written as $y = \Lambda_1 \eta_1 + \varepsilon_1 = \Lambda_2 \xi + \delta$. In this formulation, $y$ is a $(p \times 1)$ vector of endogenous indicators, $x$ is a $(q \times 1)$ vector of exogenous indicators, $\Lambda_1$ is a $(p \times m)$ matrix of regression coefficients of $\eta_1$ on $y$, $\Lambda_2$ is a $(q \times n)$ matrix of regression coefficients of $\xi$ on $x$, $\varepsilon$ is a $(p \times 1)$ vector of measurement error for the indicators of endogenous variables, and $\delta$ is a $(q \times 1)$ vector of measurement error for the indicators of exogenous variables.

**Measurement Model Results for Latent Variables**

Consistent with the two-step approach of Anderson and Gerbing (1988), we estimated a measurement model prior to examining the structural model. We modeled the two capability constraint constructs ($\xi_1, \xi_2$), the two social constraint constructs ($\xi_3, \xi_4$), and the mediating performance measure ($\eta_1$) as five correlated first-order factors. To provide a metric, we set the factor loading for an indicator of each latent construct at 1 (Bollen 1989). Table 2 reports factor loadings, internal consistency, convergent validity, and discriminant validity, based on measures from Fornell and Larcker (1981).
Table 2 Measurement Model

<table>
<thead>
<tr>
<th>Latent variables</th>
<th>Internal consistency¹</th>
<th>Average variance extracted²</th>
<th>Correlations between latent variables³</th>
</tr>
</thead>
<tbody>
<tr>
<td>(ξ₁) Capability constraints: Distance from existing technical capabilities</td>
<td>0.98</td>
<td>0.97</td>
<td>0.98</td>
</tr>
<tr>
<td>(ξ₂) Capability constraints: Distance from existing marketing capabilities</td>
<td>0.85</td>
<td>0.66</td>
<td>0.45 0.81</td>
</tr>
<tr>
<td>(ξ₃) Internal social constraints: Fit with systems</td>
<td>0.91</td>
<td>0.63</td>
<td>0.23 0.37 0.79</td>
</tr>
<tr>
<td>(ξ₄) Internal social constraints: Social acceptance of targeted capabilities</td>
<td>0.98</td>
<td>0.97</td>
<td>0.14 0.16 0.37 0.98</td>
</tr>
<tr>
<td>(η₁) Firm’s ability to create the targeted capabilities</td>
<td>0.90</td>
<td>0.76</td>
<td>0.38 0.33 0.34 −0.31 0.87</td>
</tr>
</tbody>
</table>

Measurement paths

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Unstandardized estimates</th>
<th>Critical ratio (estimate/SE) (1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(ξ₁) Capability constraints: Distance from existing technical capabilities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Closeness of existing technical capabilities</td>
<td>λₓ₁₁  0.98</td>
<td>4.96∗∗∗</td>
</tr>
<tr>
<td>• Strength of existing technical capabilities</td>
<td>λₓ₁₂  1.00</td>
<td>Fixed</td>
</tr>
<tr>
<td>(ξ₂) Capability constraints: Distance from existing marketing capabilities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Closeness of existing marketing capabilities</td>
<td>λₓ₃₁  0.82</td>
<td>8.26∗∗∗</td>
</tr>
<tr>
<td>• Strength of existing marketing capabilities</td>
<td>λₓ₄₁  1.00</td>
<td>Fixed</td>
</tr>
<tr>
<td>• Familiarity with customer in targeted capability area</td>
<td>λₓ₅₁  0.55</td>
<td>6.48∗∗∗</td>
</tr>
<tr>
<td>(ξ₃) Internal social constraints: Fit with systems</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Fit of targeted capabilities with firm’s systems and culture</td>
<td>λₓ₆₁  1.00</td>
<td>Fixed</td>
</tr>
<tr>
<td>• Fit of incentive systems to hire new people</td>
<td>λₓ₇₁  0.70</td>
<td>5.83∗∗∗</td>
</tr>
<tr>
<td>• Fit of incentive systems to integrate newly hired people</td>
<td>λₓ₈₁  0.62</td>
<td>5.46∗∗</td>
</tr>
<tr>
<td>(ξ₄) Internal social constraints: Social acceptance of targeted capabilities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Development of needed capabilities triggered little or no internal competition</td>
<td>λₓ₹₁  0.98</td>
<td>5.98∗∗∗</td>
</tr>
<tr>
<td>• Development of needed capabilities triggered little or no internal resistance</td>
<td>λₓ₁₀₁  1.00</td>
<td>Fixed</td>
</tr>
<tr>
<td>(η₁) Firm’s ability to obtain the targeted capabilities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• R&amp;D capabilities</td>
<td>λᵧ₁₁  1.00</td>
<td>Fixed</td>
</tr>
<tr>
<td>• Information technology capabilities</td>
<td>λᵧ₂₁  0.99</td>
<td>4.06∗∗</td>
</tr>
<tr>
<td>• Marketing capabilities</td>
<td>λᵧ₃₁  0.55</td>
<td>2.86∗**</td>
</tr>
</tbody>
</table>

Notes. Critical ratio (CR) values greater than 1.64, 1.96, and 2.32 are statistically significant at 90%, 95%, and 99% confidence level, respectively.

¹Internal consistency ($\sum \lambda_{ij}^2/\left[\sum \lambda_{ij}^2 + \sum (1 - \lambda_{ij}^2)\right]$). The internal consistency measure is similar to Cronback’s alpha, except that the alpha measure assumes that each indicator of a construct contributes equally (i.e., the loading is equal to unity). Fornell and Larcker (1981) argue that their measure is superior to Cronback’s alpha because their measure uses item loadings estimated within the causal model.

²Average variance extracted (AVE) = $\sum \lambda_{ij}^2/\left[\sum \lambda_{ij}^2 + \sum (1 - \lambda_{ij}^2)\right]$. AVE reports the average amount of variance in the indicators explained by the latent variable (relative to their average measurement error) and the correlations ($\phi$ estimates) among the latent constructs in the model.

³The on-diagonal elements are the square root of the AVE, which assesses discriminant validity (Fornell and Larcker 1981).

∗∗∗Statistically significant at 99% confidence level.

All the nonfixed indicator loadings for each construct are significant ($p < 0.01$) and range from 0.55 to 0.98. A common rule of thumb is to accept items with more explanatory power than error variance (Carmines and Zeller 1979), which in practice implies accepting loadings greater than 0.70. The data meet this criterion for all but three items. We retained those items to maintain a richer measure of our constructs (we found similar results when we dropped the items). The estimates of the “average variance extracted” range from 0.63 to 0.93, which is higher than the 0.50 threshold that Fornell and Larcker (1981) recommend to demonstrate convergent validity. Each construct shares more variance with its measures than it shares with other constructs (the correlation between any two constructs is less than the square root of the average variance extracted of the two constructs), demonstrating discriminant validity.

Results

Figure 1 reports the structural model. The results support the hypotheses, with one intriguing exception.

The results strongly support Hypothesis 1, concerning capability constraints. Firms that selected internal development rather than external sourcing of new capabilities when technical and marketing capability gaps were small were more effective in developing the needed capabilities and, in turn, more likely to survive than firms that did not evaluate their capability constraints.

The results partially support Hypothesis 2, concerning internal social constraints, with an exception. As expected, firms that selected internal development rather than external sourcing of new capabilities when they expected the new capabilities to fit with their internal systems were more effective in developing needed
capabilities and, in turn, more likely to survive than firms that did not evaluate their internal systems fit.

In contrast, counter to Hypothesis 2, firms that undertook internal development of new capabilities that faced low social acceptance among members of the organization were more successful in developing new capabilities than firms that used internal development only for projects that would not create social conflicts. Hence, although paying attention to internal social context when forming the portfolio of internal development and external sourcing projects is valuable with respect to systems fit, paying too much attention to avoiding conflict can reduce the firm’s ability to renew its capabilities. We return to this result in the discussion section.

Several control variables influenced survival. Older firms, firms with higher advertising investment, and state-owned firms were more likely to survive. Surprisingly, we found a negative relationship between a firm’s R&D investment and its survival, perhaps because too much focus on internal R&D activities rendered firms inward focused and less prone to search for radical new external capabilities. Size had no influence (we found similar results when we estimated models with sales as a measure of size). Thus, age has more impact on survival than size. Perhaps in an industry in which firms grow rapidly through acquisitions while often lacking integration skills, firm age is a better proxy for firm resilience. We found that the home region of a respondent firm affects firm survival such that respondents outside the United States, in particular those from Europe, are more likely to exit. Firms outside the United States might have been affected more negatively by the changes in the telecom industry and the difficulties of acquiring new capabilities than U.S. firms that had access to a wider pool of talents, partners, and acquisition targets in capability areas such as marketing and information technology.

Several supplemental analyses demonstrated the robustness of the results. We reestimated the analyses by collapsing the dissolved and acquired categories within our survival dependent variable ($\eta_2$), thereby creating a dummy that took the value of 1 for surviving firms and 0 otherwise. Our results did not change qualitatively; the relationship between ($\eta_1$) and ($\eta_2$) became slightly weaker, while remaining statistically significant.

We also added direct paths between our four independent variables ($\xi_1$, $\xi_2$, $\xi_3$, $\xi_4$) and survival ($\eta_2$), in addition to their indirect influence on survival through the mediating outcome variable ($\eta_1$). None of the direct paths between the four independent variables and the firm’s survival was significant, while the reported results did not change qualitatively.

Another limit of the existing model is that most of our items address situations where the capability gap is small or internal friction is limited. When we designed the survey instrument, we sought to be parsimonious and to avoid asking two sets of similar questions. We asked the respondents whether they preferred internal development over external sourcing under specific conditions (small technical gap, small commercial gap, fit with systems, low resistance) and did not ask a similar set of questions where we would have asked whether
they would have preferred external sourcing over internal development under the reverse conditions.

Nonetheless, the survey also included a few questions that asked about the firms’ practices when there was a large capability gap or high internal friction. In particular, we asked whether they used acquisitions and alliances to develop radically new capabilities (large capability gap) or capabilities that entailed major internal reorganization (high internal friction). We tested an extended model that added a construct \( \xi_5 \) that captures the extent to which firms resorted to external sourcing to develop distant or conflicting capabilities. The new construct includes two items: The first item is the average of the scores on the two survey questions that ask whether the firm has used acquisitions (question 1) or alliances (question 2) to acquire radically new capabilities (scale of 1–7); the second item is the average of the scores on the two survey questions that ask whether the firm has used acquisitions (question 3) or alliances (question 4) to acquire capabilities that require a major reorganization of the firm (scale of 1–7). This new construct has a positive and significant effect on the firm’s ability to renew its capabilities \( (B = 0.22, CR = 2.05, p = 0.04) \), consistent with the reported results, but the renewal influences in the initial model \( (\xi_1, \xi_2, \xi_3, \xi_4) \) did not change. Thus, these results suggest that firms that use external sourcing to close large capability gaps or obtain resources that do not fit with internal contexts are better able to renew their capabilities than firms that do not use external sourcing for distant capability searches.

Self-selection issues might arise in the study. Firms that survive might be firms that accumulated the highest experience in both internal development and external sourcing. This would generate potentially confounding influences between the firm’s ability to select the appropriate mode of sourcing (based on capability and social constraints) and other benefits that stem from its experience, such as learning by doing and other contingencies that influence the selection of different modes of capability sourcing. To control for potential self-selection, we created a new variable that measured the firm’s combined internal development and external sourcing experience. This variable is the sum of two seven-point scale items that capture the extent to which the firm used internal development and external sourcing to create new capabilities in the past three to five years. A high value on the variable represents significant experience in both internal development and external sourcing.

We estimated a two-stage model where, in addition to a direct effect of the firm’s combined experience in internal development and external sourcing on resource renewal \( (\eta_1) \) and survival \( (\eta_2) \), the experience variable constituted an antecedent of the firm’s ability to select its modes of capability sourcing (i.e., has an effect on \( [\xi_1, \xi_2, \xi_3, \xi_4] \)). We then assessed the remaining effect of the relationship between evaluation of capability and social constraints in sourcing decisions and the firm’s ability to renew its capabilities beyond the pure experience effect. As Figure 2 shows, the initial results remained robust.

**Figure 2 Results Including Influences of Internal and External Sourcing Experience**

<table>
<thead>
<tr>
<th>Use of internal development vs. external sourcing based on capability gap</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical capability gap ( \xi_1 )</td>
</tr>
<tr>
<td>0.13*</td>
</tr>
<tr>
<td>Marketing capability gap ( \xi_2 )</td>
</tr>
<tr>
<td>0.01</td>
</tr>
<tr>
<td>Use of internal development vs. external sourcing based on firm’s internal frictions</td>
</tr>
<tr>
<td>Fit of targeted capabilities with internal systems ( \xi_3 )</td>
</tr>
<tr>
<td>0.10*</td>
</tr>
<tr>
<td>Social acceptance of targeted capabilities ( \xi_4 )</td>
</tr>
<tr>
<td>0.07</td>
</tr>
</tbody>
</table>

**Use of internal development vs. external sourcing based on capability gap**

- Technical capability gap \( \xi_1 \)
- Marketing capability gap \( \xi_2 \)
- Fit of targeted capabilities with internal systems \( \xi_3 \)
- Social acceptance of targeted capabilities \( \xi_4 \)

**Use of internal development vs. external sourcing based on firm’s internal frictions**

- Firm’s effectiveness in creating capabilities \( \eta_1 \)
- 0.32\*           
- Firm’s survival \( \eta_2 \)
- 0.18\*           

**Controls:**
- Firm size
- Firm age (+)
- Firm geographic scope
- Firm R&D/sales (-)
- Firm fixed assets/sales (+)
- Firm ROE
- Firm private firm (-)
- Firm listed firm (-)
- Importance of regulation
- Europe (-)
- Rest of the world

**R\(^2\) = 0.50**

**Note:** *p < 0.05; **p < 0.01 (two-tailed tests).*
Discussion and Conclusion

This paper predicted that firms that select modes of sourcing new capabilities appropriately will be better able to renew their capabilities and will survive longer than firms with weaker selection capabilities. We argue that firms that take into account constraints based on their capabilities and internal social contexts when choosing between internal development and external sourcing will be more effective at developing new capabilities and, in turn, will survive longer than firms that assess those constraints poorly. The core argument is that firms need to develop the ability to assess the most appropriate mode of capability sourcing in the face of constraints that arise from their existing stocks of capabilities and their internal social contexts. The analysis supports most core predictions, with intriguing variations in the impact of some social factors. Overall, the results suggest that capability and social arguments complement the insights of perspectives, such as transaction cost economics, in which external market failures drive firms’ boundary decisions (Jacobides and Winter 2005, Santos and Eisenhardt 2005).

The results concerning capability constraints add voice to a central debate in extending the resource-based view of the firm to an understanding of dynamic capabilities by which firms can attempt to change their existing resources (Peteraf and Barney 2003, Helfat and Peteraf 2003, Lavie 2006). We found that firms that properly consider the role of their existing capabilities in their capability-sourcing decisions fare better than firms that do not consider criteria that the resource-based view highlights. Although the resource-based view of the firm has been criticized for being an ex post rationalization (Priem and Butler 2001), our study suggests that capability-based perspectives offer prescriptive implications.

The results also highlight both the benefits and the costs of heeding social factors when forming the portfolio of internal development and external sourcing projects, an issue that prior research has underemphasized. In particular, the results demonstrate the role of more socially and behaviorally based factors in capability sourcing, as a complement to the seemingly more objective role of stocks of capabilities. Indeed, the contrasting results we obtained between the impact of the two social variables—the benefits of systems fit and the costs of conflict avoidance—on a firm’s performance can be interpreted in light of the literature that discusses the benefits of conflict.

The value of undertaking internal development when the activities would generate conflict rather than avoid conflict initially appeared counterintuitive. A possible explanation emerged, however, in reviewing our interviews with telecommunications industry executives. In particular, as well as having a potential for disruption, conflict can help create new views of problems and generate new insights for solutions. Firms that have learned how to take advantage of conflict, although they limit potential harm, may benefit by initiating internal projects in conflict-strewn environments.

Drilling down into the conflict literature reinforces this interpretation. Traditionally, theorists have viewed conflict as disruptive. More recently, however, some scholars suggest that conflict may help people identify better options, so that firms that learn how to manage conflict may benefit by making sourcing choices that engender conflict (McGrath 1984, Eisenhardt and Schoonhoven 1990). Jehn (1997), for instance, finds that groups that accept conflict around tasks, such as capability development in our context, are particularly effective. Firms that can strike a subtle balance between organizational processes that nurture legacy (align with current incentive systems) and favor adaptation (introduce competing business models) may be able to achieve a degree of organizational ambidexterity that will help them create new capabilities (Tushman and O’Reilly 1996, Gibson and Birkinshaw 2004).

The difference between the benefits of systems fit and the costs of overemphasizing social acceptance highlights a key difference in the nature of these two aspects of internal institutions. Systemic institutions, such as incentive systems, encompass routine-based activities that typically fall outside the control of individuals and are difficult to change quickly. By contrast, a substantial degree of competition resides within the purview of individual members of the organization. Although individuals often have political incentives and inertial values that cause them to oppose changes, it is often easier for individuals to change their direction than it is to change broadly embedded routines. The general speculation that arises from this distinction is that firms may be able to facilitate change by focusing on the flexibility of individuals even when they are constrained by the inertia of...
In 1990 and 1992, the authors examined the relationship between a firm’s constraints, its internal development in the form of in-house growth, and its capability-sourcing strategies. They found that firms may face greater time to develop capabilities (Dierickx and Cool 1989). In fast-moving sectors, external sourcing may dominate even if the competitive environment changes frequently. In slower-moving industries, internal development may trump internal development for a greater range of capabilities. In fast-moving sectors, external sourcing may dominate even if the competitive environment changes frequently. In slower-moving industries, internal development may trump internal development for a greater range of capabilities.

The limitations offer paths for future research. Examining the assumptions about individuals’ rationality and firms’ capability-sourcing strategies is important, notably for a stream of research that is still in its early stage of development. It would also be valuable for further research to use different empirical methods to capture the relationship between a firm’s constraints, sourcing modes, and ultimate performance. Additional qualitative research would deepen the notion of a firm’s ability to assess its capability needs and manage choices of capability sourcing, and to clarify how firms frame internal contexts to balance legacy and change. Insights into whether and when firms decide to abandon their process of searching for new capabilities could be gained through fieldwork. In addition, other contingencies may mediate the relationship between the firm’s survival and the nature of its capability-sourcing choices; candidates include the pace of the competitive environment, capability uncertainty, competitors’ capability development and their modes of capability sourcing, the firm’s internal and external governance skills, social connections, and leadership skills. It would also be useful to examine how the influences of internal factors such as capability and social climate interact with external factors such as market failures. Moreover, it would be helpful to break the aggregate category of external sourcing into a more diverse set of external modes. Finally, further research could test the how well the findings generalize across industries with different innovation rates.

Nonetheless, this study advances the emerging discussion of how firms change in the face of constraints to change. Research in strategy, economics, and organizational theory has been animated by conflicting perspectives about change (Levinthal 1991). On one hand, extensive literature identifies many barriers to firm change. Indeed, a presumption of inertia or, at best, path-dependent change, may be the dominant theme of organizational research during the past quarter century (e.g., Nelson and Winter 1982, Hannan and Freeman 1984, Tushman and Anderson 1986, Cohen and Levinthal 1990). On the other hand, there is a large and diverse branch of literature on adaptive organizational change, addressing topics such as boundary choices for new transactions (Williamson 1975), top management turnover (Hambrick et al. 1996), and changes in leadership decision-making criteria (McNulty and Pettigrew 1999). Traditionally, these two hands have often waved past each other, stressing either constraints or adaptability.

This study helps address the intersection between inertial and adaptive pressures. A small body of research has focused on the interface between constraints and change, attempting to identify ways that firms change in the face of constraints to change. Early work developed the idea of punctuated equilibria (e.g., Gersick 1991, Romanelli and Tushman 1994, Sastry 1997), arguing that major changes occurred infrequently. More recently, strategy research has suggested the idea of dynamic capabilities that help firms undertake substantial ongoing changes (Teece et al. 1997, Eisenhardt and Martin 2000, Helfat et al. 2006). The conceptual framework for the dynamic capabilities perspective is still emerging. One task in pursuing research on firm renewal lies in identifying...
mechanisms that firms use to overcome constraints to change (Siggelkow 2001, Zollo and Winter 2002).

Most generally, this paper suggests that internal and external modes of capability sourcing are key mechanisms by which firms can attempt to change in the face of capability and social constraints. Ultimately, the ability to manage the challenge of selecting appropriate sourcing modes has a substantial impact on a firm’s long-term survival in dynamic environments.

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Endnote

1The three external sourcing modes lie along a continuum (Leonard 1995), where motives for external sourcing strengthen as firms move from purchase contract to alliances to acquisitions. The initial drivers for selecting external sourcing are similar, so that it is appropriate to treat external modes as a category. Arora and Gambardella (1990), for instance, show that use of different external modes tends to covary, separately from internal sourcing.

References


