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

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2007/61/ST

**SELECTION CAPABILITY: HOW CAPABILITY GAPS AND INTERNAL SOCIAL  
FRICTIONS AFFECT INTERNAL AND EXTERNAL STRATEGIC RENEWAL**

by  
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**Forthcoming in *Organization Science***

**ACKNOWLEDGMENTS**

We are grateful to Gautam Ahuja, Ranjay Gulati, Will Ocasio, Jeffrey Reuer, Karen Schnatterly, Myles Shaver, Klaus Weber and seminar participants at London Business School, the University of Michigan, North Carolina, Northwestern, and Minnesota, and at the 2007 Chicago Conference on Strategic Renewal for their valuable feedback on earlier drafts of this paper. We appreciate careful copy-editing by Tamzin Mitchell. We thank the Guest Editors, Rasjhree Agarwal and Connie Helfat and the three anonymous referees for their support and guidance during the review process.

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**SELECTION CAPABILITY: HOW CAPABILITY GAPS AND INTERNAL SOCIAL  
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**ABSTRACT**

The dynamic capabilities literature suggests that firms need to use both internal development and external sourcing in order 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 under-emphasized 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.

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). 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 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, open 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 under-emphasized 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), alliances (Kale, Dyer and Singh, 2002), 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 stem 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: 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 arise 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 arise from their internal social context will be more effective at developing new capabilities when choosing between internal development and external sourcing, and 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, Madsen and Carini, 2002). Both established telecommunications firms and industry newcomers faced substantial need to acquire new capabilities that would suit the changing environment (Chen, Williams and Agarwal, 2006).

The study uses three sets of data. While developing our conceptual arguments, we conducted twenty-six interviews with knowledgeable executives in order 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: 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, in order 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 both dissimilar from needed capabilities (capability distance) and when the 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 capabilities and its 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 needed 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 telecommunications 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 U.S. 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 multi-dimensional 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 quotes below 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, Nelson and Winter, 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 versus 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.<sup>1</sup> 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 non-equity joint ventures or R&D and marketing partnerships. Acquisitions

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<sup>1</sup> The 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 co-vary together, separately from internal sourcing.

involve obtaining majority control of other entities, including acquiring entire corporations and purchasing individual businesses from ongoing corporations.

Internal development offers advantages and disadvantages relative to external sourcing of new capabilities. External sourcing often raises appropriation concerns due to difficulties in screening and transferring capabilities into the firm (Williamson, 1975), thereby creating incentives for internal sourcing in order to protect the value of the capabilities (Teece, 1986; Gulati and Singh, 1998). When a targeted capability has 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, Dyer and Singh, 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, due to 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 search for new capabilities (Penrose, 1959; Cohen and Levinthal, 1990; Kraatz and Zajac, 2001), and to look inside rather than outside the firm (Pisano, 1990; Barney, 1999; Rao and Drazin, 2002; White, 2000; Cuervo-Cazurra, 1999; Delmas, 1999). Furthermore, when firms lack key resources, they may face what Dierickx and Cool (1989) refer to as time compression diseconomies, which impose time constraints in dynamic environments (D'Aveni, 1994).

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 geographical 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 to 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 necessary to pursue the development of needed capabilities. Internal social constraints arise when internal friction inhibits internal development of capabilities.

## **INTERNAL DEVELOPMENT VERSUS 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: 753) argue that capability gaps affect the likelihood, speed, and mode of market entry. In particular, they argue that “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 its 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: 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 we 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 Polodny (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 optical disk industry, Rosenkopf and Nerkar (2001) found that exploration that did not span firm boundaries had 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 Schmittlein, 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, the 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 for a start-up operation (Kogut and Zander, 1992). The firm may even consider abandoning the development of the targeted capabilities if the capability 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 geographical markets (Carow, Heron and Saxton, 2004; Krishnan, Satish and Krishnan, 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, Mitchell and Dussauge, 1998) or use the ally's strength (Dussauge, Garrette and Mitchell, 2000). Examining the product line evolution of firms in the US 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 non-acquirers 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 yields valuable firm-specific capabilities.

Prevailing routines act as a truce in intra-organizational conflict (Nelson and Winter, 1982: 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: 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). They may even shun the development of new capabilities in order 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 will place it on rigid trajectories if the firm does not find alternative means of obtaining new capabilities. As Powell and Smith-Doerr (1994: 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 non-rational, behavioral components of the firm's capacity to develop new capabilities internally. It closely parallels Abernathy and Clark's (1985) and Tushman and Anderson's (1986) notion 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 internal 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. The 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. Lastly, 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 a survey of telecommunications firms that were located in countries 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 twenty-six 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 eleven open-ended interviews to gather information on the industry, the types of capabilities 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?”, and “How do you intend to acquire those needed skills?” Each interviewee then discussed the modes of acquiring new capabilities that their 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 IP (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 to develop the needed capabilities. 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 on-site interviews allowed a rich interaction with people at the firms, as the executives introduced us to colleagues in order 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 pre-tested the survey with senior North American and European executives from diverse backgrounds. We pilot-tested the revised survey instrument with on-site 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 US, 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 includes 162 telecommunications firms.

Third, we collected survival data on our 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 the 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 to that of their main competitors, in three capability areas: 1) R&D capabilities, 2) IT 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 firm-wide 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 7-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  $\alpha$ -Cronback 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  $\alpha$ -Cronback 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  $\alpha$ -Cronback 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).  $\alpha$ -

Cronback 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 inter-organizational 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 compared to smaller firms. We measured firm size using a five-point scale based upon the number of employees worldwide (1 for firms that have fewer than 200 employees; 5 for firms that have more than five thousand 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 firm's age using a five-point scale (1 for firms that are younger than two years; 5 for firms that are older than twenty 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 five percent; 5 equal to an ROE above twenty percent).

*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 Moreck and Yeung's (1992) measure, 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 two percent of their sales on R&D; 5 for firms that spend more than fifteen percent). 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, Hillman and Keim, 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.

\*\*\*\*\* **Insert Table 1 about here** \*\*\*\*\*

### **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, with 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 firms' 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 non-

respondents to establish whether sampling bias was a problem. We found no significant differences in the financial and economic profile of 27 respondents and 63 non-respondents 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 non-respondents 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 mediating variable ( $\eta_1$ ) influenced the results, we followed the unmeasured latent variable approach from Podsakoff, MacKenzie, Lee and Podsakoff (2003). In the structural models that we describe below, 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, while 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 percent of the variance. Because no single dominating factor emerged, common method variance is 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 limits the chance that answers to one set of questions would determine answers to later questions, and reduces 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 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  $\eta = \beta\eta + \Gamma\xi + \zeta$ , 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 ( $\eta_2$ ). 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  $y = \Lambda_y \eta + \varepsilon$ ;  $x = \Lambda_x \xi + \delta$ . In this formulation,  $y$  is a

( $p \times 1$ ) vector of endogenous indicators,  $x$  is a ( $q \times 1$ ) vector of exogenous indicators,  $\Lambda_y$  is a ( $p \times m$ ) matrix of regression coefficients of  $\eta$  on  $y$ ,  $\Lambda_x$  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 Anderson and Gerbing's (1988) two-step approach, 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).

\*\*\*\*\* **Insert Table 2 about here** \*\*\*\*\*

All the non-fixed 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 in order 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 1a reports the structural model. The results support the hypotheses, with one intriguing exception.

\*\*\*\*\* **Figure 1a here** \*\*\*\*\*

The results strongly support hypothesis one, 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 two, 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 US, in particular those from Europe, are more likely to exit. Firms outside the US might have

been affected more negatively by the changes in the telecom industry and the difficulties of acquiring new capabilities compared to US firms that had access to a wider pool of talents, partners, and acquisition targets in capability areas such as marketing and IT.

Several supplemental analyses demonstrated the robustness of the results. We re-estimated 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 still 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 (1-7 scale); 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 (1-7 scale). 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, while 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 7-point scale items, which capture the extent to which the firm had 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 1b shows, the initial results remained

robust.

\*\*\*\*\* **Figure 1b here** \*\*\*\*\*

Two results in Figure 1b concerning sourcing experience had intriguing implications. First, there was no systematic direct effect of the firm's combined internal development and external sourcing experience on its ability to change and survive. This null result suggests that simply resorting to both modes of sourcing does not guarantee superior performance. Instead, firms must select sourcing modes that reflect particular contexts. Second, firms with substantial experience in both modes of capability sourcing were more likely to evaluate their technical capability gaps and the fit of the targeted capabilities with their internal systems when making capability sourcing choices. Thus, experience helped firms develop the dynamic capability to select appropriate capability sourcing modes.

## **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. While 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 under-emphasized. 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 counter-intuitive. 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, while limiting 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 costs of over-emphasizing 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. While 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 routines. Clearly, of course, these implications are preliminary and would benefit from additional research.

The study has several limits. We assume that managers make at least partially deliberate efforts to close capability gaps (Dosi, Nelson and Winter, 2000). Organizational inertia, individuals' emotional and cognitive sunk costs, and entrenched interests constitute hurdles to the deployment of efforts for closing capability gaps. Managers may decide not to start the search process or may abandon efforts after initial attempts fail, notably when capability gaps or internal frictions are too high. In a similar vein, we assume that managers have the ability to identify the capabilities they need. Yet, managers may be rationally bounded and not fully capable of assessing their capability needs, notably in industries with rapid change and high uncertainty about the value of future capabilities. Indeed, there may be a more fundamental selection capability that represents firms' ability to identify relevant capabilities.

We also assume that managers can give a retrospective estimate of their capability needs, which may create biases, notably when uncertainty associated with the needed capabilities declines over time. Judgmental bias may occur when decision makers gain information over time and then try to recall prior knowledge. Fischhoff (1975) refers to this as hindsight bias, which is the tendency to exaggerate what one knew before. This exaggeration narrows the gap between what we knew and what we know, and distorts our ability to provide a fair retrospective estimate of the capability gap.

In addition, we do not control whether other firms' actions influence a focal firm's capability sourcing choices (Abrahamson; 1991; Greve and Taylor, 2000). However, if highly visible firms emphasize external sourcing, then a geographically proximate firm or a firm in a close competitive product-market might be more likely to undertake similar actions when attempting to fill capability gaps.

Finally, we recognize that our results may have limits in generalizing to different industry settings. The telecom industry is characterized by rapid changes, technological uncertainty, deregulation, and competitive intensity. In such fast-moving sectors, external sourcing may trump internal development for a greater range of projects while, in slower moving industries, the benefits of internal development may dominate even if the technology is not close to current capabilities if firms have greater time to develop capabilities (Dierickx and Cool, 1989).

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 which 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, to manage choices of capability sourcing, and 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 the 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, Cho and Chen, 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, Pisano and Shuen, 1997; Eisenhardt and Martin, 2000; Helfat, et al., 2007). 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.

## REFERENCES

- Abernathy, W.J., K.B. Clark. 1985. Innovation: Mapping the winds of creative destruction. *Res. Policy*, **14**:3-22.
- Abrahamson, A. A. (1991). Managerial fads and fashions: The diffusion and rejection of innovations. *Acad. of Management Rev.* **16** (3): 586-612
- Amit, R., P.J.H. Schoemaker, 1993. Strategic assets and organizational rent. *Strategic Management J.*, **14**: 33-46.
- Anderson, E., D.C. Schmittlein. 1984. Integration of the sales force: An empirical examination. *RAND J. of Econom.*, **15**(3): 385-395.
- Anderson, J.C., D.W. Gerbing. 1988. Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin.* **103**(3): 411-23.
- Arbuckle, J.L. 2002. *Amos 4.0. Users Guide*. Chicago: SPSS Inc.
- Armstrong, J.S., T.S. Overton. 1977. Estimating non-response bias in mail surveys. *J. of Marketing Res.* **14**: 396-402.
- Arora, A., A. Gambardella. 1990. Complementary and external linkages: The strategies of the large firms in biotechnology. *J. of Industrial Econom.* **3**(4): 361-379.
- Barkema, H., F. Vermeulen. 1998. International expansion through start-up or acquisition: A learning perspective. *Acad. of Management J.* **41**: 7-26.
- Barney, J. 1999. How a firm's capabilities affect boundary decisions. *Sloan Management Rev.* **40**(3): 137-145.
- Bartlett, C., S. Ghoshal. 1989. Managing innovation in the transnational corporation. In C.A. Bartlett, Y. Doz and G. Hedlund (Eds.). *Managing the Global Firm*. London and New York: Routledge, 215:255.
- Baumgartner, H, J.B. Steenkamp. 2001. Responses styles in marketing research: A cross-national investigation. *J. of Marketing Res.* **38**:143-156.
- Bollen, K.A. 1989. *Structural equations with latent variables*. John Wiley. New York.
- Bonardi, J.-P., A.J. Hillman, G.D. Keim. 2005. The Attractiveness of Political Markets: Implications for Firm Strategy. *Acad. of Management Rev.* **30**(2): 397-413.
- Capron, L. 1999. The long-term performance of horizontal acquisitions. *Strategic Management J.* **20**: 987-1018
- Capron, L., P. Dussauge, W. Mitchell. 1998. Resource Redeployment Following Horizontal Acquisitions in Europe and North America, 1988-1992. *Strategic Management J.* **19** (7): 631-661.
- Capron, L., N. Pistre. 2002. When do Acquirers Earn Abnormal Returns? *Strategic Management J.* Lead Article. Vol. 23 (9) : 781-794.
- Carmines, E.G., R.A Zeller. 1979. Reliability and validity assessment. Sage University Paper Series in *Quantitative Applications in the Social Sciences*. Beverly Hills. CA: Sage.
- Carow, K., R. Heron, T. Saxton. 2004. Do early birds get the returns? An empirical investigation of early-mover advantages in acquisitions. *Strategic Management J.* **25**: 563-585.
- Chatterjee, S. 1990. Excess capabilities, utilization costs, and mode of entry. *Acad. of Management J.* **33**:780-800.
- Chen, P-L., F.C. Williams, R. Agarwal. 2006. Flexibility and change: Growing through shifting technology standards in the U.S. cellular technology. Paper presented at Acad. of Management Conf. Atlanta, GA. August 11-16.
- Chi, T. 1994. Trading in strategic capabilities: Necessary conditions, transaction cost problems, and choice of exchange structure. *Strategic Management J.* **15**: 271-290.
- Cho, T.S., D.C. Hambrick. 2006. Attention as the mediator between top management team characteristics and strategic change: The case of airline deregulation. *Organ. Sci.* **17** (4): 453-469.
- Cohen, W.M., D. Levinthal. 1990. Absorptive capacity: A new perspective on learning and innovation. *Admin. Sci. Quart.* **35**: 128-152.
- Cuervo-Cazurra, A. 1999. Resource development through the co-evolution of capabilities and scope. Unpublished doctoral dissertation, MIT.
- Cyert, R.M., J.G. March. 1963. *A Behavioral Theory of the Firm*. Englewood Cliffs, NJ: Prentice-Hall.
- D'Aveni, R. 1994. *Hypercompetition: Managing the dynamics of strategic maneuvering*. New York: Free Press.
- Delmas, M. 1999. Exposing strategic assets to create new competencies: The case of technological acquisition in the waste management industry in Europe and North America. *Indust. and Corporate Change.* **8**(4): 635-671.
- Delmas, M., Y. Tokat. 2005. Deregulation, governance structures, and efficiency: the U.S. electric utility sector, *Strategic Management J.* **26**(5): 441-460.
- Dierickx, I., K. Cool. 1989. Asset stock accumulation and sustainability of competitive advantage. *Management Sci.* **35**: 1504-1514.
- Dillman, D. 1978. *Mail and telephone surveys: The total design method*. New York: Wiley.
- DiMaggio, P.J., W.W. Powell. 1983. The iron cage revisited: Institutional isomorphism and collective rationality in

- organizational fields. *Amer. Sociological Rev.* **48**:147-160.
- Dosi, G. 1982. Technological paradigms and technological trajectories. *Res. Policy.* **11**:147-162.
- Dosi, G., R.R. Nelson, S.G. Winter. 2000. Introduction: the nature and dynamics of organizational capabilities”, in G. Dosi, R.R. Nelson, and S.G. Winter (eds.), *The Nature and Dynamics of Organizational Capabilities*. Oxford University Press: New York.
- Dussauge, P., B. Garrette, W. Mitchell. 2000. Learning from competing partners: Outcomes and durations of scale and link alliances in Europe, North America and Asia. *Strategic Management J.* **21**: 99-126.
- Eisenhardt, K.M., J.A. Martin. 2000. Dynamic capabilities: What are they? *Strategic Management J.* Special issue: **21**: 1105-1121.
- Eisenhardt, K., C. Schoonhoven. 1990. Organizational growth: Linking founding team, strategy, environment, and growth among U.S. semiconductor ventures, 1978-1988. *Admin. Sci. Quart.* **35**: 504-529.
- Fischhoff, B. 1975. Hindsight/foresight: the effect of outcome knowledge on judgment under uncertainty. *J. of Experimental Psychology: Human Perception and Performance*, 1 (3): 288-299.
- Fornell, C., D. Larcker. 1981. Evaluating structural equation models with unobservable variables and measurement error. *J. of Marketing Res.* **18**:39-50.
- Galunic, D.C., S. Rodan. 1998. Resource recombinations in the firm: Knowledge structures and the potential for Schumpeterian recombination. *Strategic Management J.* **19**:1193-1201.
- Gersick, C.J.G. 1991. Revolutionary change theories: A multilevel exploration of the punctuated equilibrium paradigm. *Acad. of Management Rev.* **16**: 10-36.
- Gibson, C.B., J. Birkinshaw. 2004. The antecedents, Consequences and Mediating Role of Organizational Ambidexterity. *Acad. of Management J.* **47**(2): 209-226.
- Ginsberg, A. 1994. Minding the competition: From mapping to mastery. *Strategic Management J.* Winter Special Issue, **15**: 153-174.
- Golden, B.R. 1992. The past is past – or is it? The use of retrospective accounts as indicators of past strategy. *Acad. of Management J.* **35**: 848-860.
- Grant, R. 1996. Towards a knowledge-based theory of the firm. *Strategic Management J.* **17**:109-122.
- Greve, H.R., A. Taylor. 2000. Innovations as Catalysts for Organizational Change. *Admin. Sci. Quart.* **45** (1): 54-80.
- Gulati, R., H. Singh. 1998. The architecture of cooperation: Managing coordination costs and appropriation concerns in strategic alliances. *Admin. Sci. Quart.* **43**: 781-814.
- Hambrick, D.C., T.S. Cho, M.J. Chen. 1996. The influence of top management team heterogeneity on firms' competitive moves, *Admin. Sci. Quart.* **41**: 659-684.
- Hannan, M.T., J. Freeman. 1984. Structural inertia and organizational change. *Amer. Sociological Rev.* **49**:149-164.
- Helfat, C.E. 1994. Evolutionary trajectories in petroleum firm R&D. *Management Sci.* **40**:1720-1747.
- Helfat, C.E., M.B. Lieberman. 2002. The birth of capabilities: Market entry and the importance of pre-history. *Indust. and Corporate Change.* **11**(4): 725-760.
- Helfat, C.E., M. Peteraf. 2003. The dynamic-resource-based view: Capability lifecycles. *Strategic Management J.* **24**(10): 997-1010.
- Helfat, C.E., S. Finkelstein, W. Mitchell, M.A. Peteraf, H. Singh, D.J. Teece, S.G. Winter. 2006. *Dynamic capabilities: Understanding strategic change in organizations*. Blackwell.
- Hennart, J.F., Y., Park. 1993. Greenfield vs. acquisition: The strategy of Japanese investors in the United States. *Management Sci.* **39**: 1054-1070
- Henderson, R.M., K.B. Clark. 1990. Architectural innovation: The reconfiguration of existing product technologies and the failure of established firms. *Admin. Sci. Quart.* **35**: 9-30.
- Jacobides, M., S. Winter. 2005. The co-evolution of capabilities and transaction costs: Explaining the institutional structure of production. *Strategic Management J.* **26**: 395-413.
- Jacobides, M., S. Billinger. 2006. Designing the boundaries of the firm: From “Make, Buy, or Ally” to the dynamic benefits of vertical architecture. *Organ. Sci.* **17** (2): 249-261.
- Jehn, K. 1997. A qualitative analysis of conflict types and dimensions in organizational change. *Admin. Sci. Quart.* **42**: 530-555.
- Kale, P., J. H. Dyer, H. Singh. 2002. Alliance capability, stock market response, and long term alliance success: The role of the alliance function. *Strategic Management J.* **23**:747-767.
- Karim, S., W. Mitchell. 2000. Reconfiguring business resources following acquisitions in the U.S. medical sector, 1978-1995. *Strategic Management J.* Special Issue, **21**:1061-1081.
- Katila, R., A. Ahuja. 2002. Something old, something new: A longitudinal study of search behavior and new product introduction. *Acad. of Management J.* **45** (6): 1183-1194.
- Kogut, B. 1991. Joint ventures and the option to expand and acquire. *Management Sci.* **37**: 19-33.

- Kogut, B., U. Zander. 1992. Knowledge of the firm, combinative capabilities, and the replication of technology. *Organ. Sci.* **3**:383-397.
- Kogut, B., U. Zander. 1996. What firms do? Coordination, identity and learning. *Organ. Sci.* **7**:502-518.
- Kraatz, M., E. Zajac. 2001. How organizational resources affect strategic change and performance in turbulent environments: Theory and evidence. *Organ. Sci.* **12**(5): 632-660.
- Krishnan, R., J. Satish, H. Krishnan, 2004. The influence of mergers on firms' product-mix strategies. *Strategic Management J.* **25**: 587-611.
- Lavie, D. 2006. Capability reconfiguration: An analysis of incumbent responses to technological change. *Acad. of Management Rev.* **31**(1): 153-174.
- Leonard, D. 1995. *Wellsprings of knowledge*. Boston, MA: Harvard Business School Press.
- Levinthal, D.A. 1991. Organizational adaptation and environmental selection – Interrelated processes of change. *Organ. Sci.* **2**(1): 140-146.
- Liebeskind, J.P. 1996. Knowledge, Strategy, and the Theory of the Firm. *Strategic Management J.* **17**: 93-107.
- Mayer, K., N. Argyres. 2004. Learning to contract: Evidence from the Personal Computer Industry. *Organ. Sci.* **15** (4): 394-411.
- McGrath, J.E. 1984. *Studying Groups*. Englewood Cliffs, NJ: Prentice-Hall.
- McNulty, T., A. Pettigrew. 1999. Strategists on the board. *Organ. Stud.* **20**:47-74.
- Menon, T., J. Pfeffer. 2003. Valuing internal vs. external knowledge: Explaining the preference for outsiders. *Management Sci.* **49**(4):497-514.
- Miller, D. 1993. The architecture of simplicity. *Acad. of Management Rev.* **14**:116-138.
- Mitchell, W.M. 1994. The dynamics of evolving markets: The effects of business sales and age on dissolutions and divestitures. *Admin. Sci. Quart.* **39** (4):575-602.
- Monteverde, K., D.J. Teece. 1982. Supplier switching costs and vertical integration in the automobile industry. *Bell J. of Econom.* **13**: 206-213.
- Morck, R., B. Yeung. 1992. Internalization, An event study test. *J. of Internat. Econom.* **33**:41-56.
- Nelson, R.R., S.G. Winter. 1982. *An evolutionary theory of economic change*. Cambridge: Belknap Press.
- Ocasio, W. 1997. Towards an attention-based view of the firm. *Strategic Management J.* **18**: 187-206.
- Oliver, C. 1997. Sustainable competitive advantage: Combining institutional and resource-based views. *Strategic Management J.* **18**:697-713.
- Penrose, E. 1959. *The theory of the growth of the firm*. New York: John Wiley.
- Peteraf, M.A., J.B. Barney. 2003. Unraveling the resource-based tangle. *Managerial and Decision Econom.* **24**(4): 309-323.
- Pisano, G. 1990. The R&D boundaries of the firm: An empirical analysis. *Admin. Sci. Quart.* **35**:153-176.
- Podsakoff, P.M., D.W. Organ 1986. Self-reports in organizational research: Problems and Prospects. *J. of Management.* **12**(4): 531-544.
- Podsakoff, P.M., S.B MacKenzie, J. Lee, N.P. Podsakoff. 2003. Common method bias in behavioral research: A critical review of the literature and recommended remedies. *J. of Applied Psych.* **88**(5): 879-903.
- Powell, W.W., L. Smith-Doer. 1994. Networks and economic life. In N.J Smelser and R. Sweberg (eds.). *The Handbook of Economic Sociology*. Princeton: Princeton Univ. Press, 368-402.
- Priem, R.L., J.E. Butler. 2001. Is the Resource-Based "View" a useful perspective for Strategic Management Research? *Acad. of Management Rev.* **26**(1): 22-40.
- Rao, H., R. Drazin. 2002. Overcoming resource constraints on product innovation by recruiting talent from rivals: A study of the mutual fund industry, 1986-94. *Acad. of Management J.* **45**: 491-507.
- Reed, R., R. DeFillippi. 1990. Causal ambiguity, barriers to imitation and sustainable competitive advantage. *Acad. of Management Review.* **15**(1): 88-102.
- Richardson, G.B., 1972. The organization of industry. *Econom. Journal*, **82**: 883-896.
- Romanelli, E., M.L. Tushman. 1994. Organizational transformation as punctuated equilibrium: An empirical test. *Acad. of Management J.* **37**:1141-1166.
- Rosenkopf, L., A. Nerkar. 2001. Beyond local search: Boundary-spanning, exploration, and impact in the optical disc industry. *Strategic Management J.* **22**: 287-306.
- Rosenkopf, L., P. Almeida. 2003. Overcoming local search through alliances and mobility. *Management Sci.* **49**(6):751-766.
- Santos, F.M., K.K. Eisenhardt. 2005. Organizational Boundaries and Theories of Organization. *Organ. Sci.* **16**(5): 491-508.
- Sastry, A. 1997. "Problems and paradoxes in a model of punctuated organizational change" *Admin. Sci. Quart.* **42**: 237-275.

- Scott, W.R. 1987. The adolescence of institutional theory. *Admin. Sci. Quart.* **32**: 493-511.
- Shaver, M., W. Mitchell 2003. Who buys what? How integration capability affects acquisition incidence and target choice. *Strategic Organ!* 1: 171-202.
- Siggelkow, N. 2001. Change in the presence of fit: The rise, the fall and the renaissance of Liz Clairbone. *Acad. of Management J.* **44** (4): 838-858.
- Singh, K., W. Mitchell. 2005. *Growth dynamics: The bi-directional relationship between interfirm collaboration and business sales in entrant and incumbent alliances*, *Strategic Management J.*, 26: 497-522.
- Stuart, Toby E., J.M. Podolny. 1996. Local search and the evolution of technological capabilities. *Strategic Management J.* **17** (Evolutionary Perspectives on Strategy Supplement): 21-38.
- Sudman, S., N.M. Bradburn, 1973. Effects of time and memory on response. *J. of the Amer. Statistical Association.* **68**(344): 805-815.
- Szulanski, G. 1996. Exploring Internal Stickiness: Impediments to the transfer of best practice within the firm. *Strategic Management J.* Winter Special Issue, **17**: 27-43.
- Teece, D.J., 1986. Profiting from technological innovation: Implications for integration, collaboration, licensing, and public policy. *Res. Policy.* **15**: 285-305.
- Teece, D.J., G. Pisano, A. Shuen. 1997. Dynamic capabilities and strategic management. *Strategic Management J.* **18**: 509-533.
- Tripsas, M., G. Gavetti. 2000. Capabilities, cognition, and inertia: Evidence from digital imaging. *Strategic Management J.* **18**: 509-533.
- Tushman, M.L., C.A. O'Reilly. 1996. The ambidextrous organization: Managing evolutionary and revolutionary change. *California Management Rev.* **38**(4): 8-30.
- Tushman, M.L., P. Anderson. 1986. Technological discontinuities and organizational environments. *Admin. Sci. Quart.* **31**: 439-465.
- Uzzi, B. 1996. The sources and consequences of embeddedness for the economic performance of organizations: The network effect. *Amer. Sociological Rev.* **61**(4): 674-698.
- Vermeulen, F., H. Barkema. 2001. Learning through acquisitions. *Acad. of Management J.* **44**(3):457-476.
- Walker, G., T. Madsen, G. Carini. 2002. How does institutional change affect heterogeneity among firms. *Strategic Management J.* **23**(2): 89;105.
- Wernerfelt, B. 1984. A resource-based view of the firm. *Strategic Management Journal*, 5: 171-180.
- White, S. 2000. Competition, capabilities, and the make, buy, or ally decisions of Chinese state-owned firms. *Acad. of Management J.* **43**(3): 324-341.
- Williams, C., W. Mitchell. 2004. Focusing firm evolution: The impact of information infrastructure on market entry by U.S Telecommunications Companies, 1994-1998. *Management Sci.* **50**(11):1561-1575.
- Williamson, O.E. 1975. *Markets and Hierarchies*. New York: Free Press.
- Winter, S. 1990. Survival, selection and inheritance in evolutionary theories of evolution. In *Organizational evolution: New directions*, 269-296 (J.V. Singh, ed.), Sage, Newbury Park, CA.
- Yip, G.S. 1982. Diversification entry: Internal development versus acquisition. *Strategic Management J.* **3**:331-345.
- Zollo, M., H. Singh. 2004. Deliberate learning in corporate acquisitions: Post-acquisition strategies and integration capability in U.S. bank mergers. *Strategic Management J.* **25**:1233-1256.
- Zollo, M., S.G. Winter. 2002. Deliberate learning and the evolution of dynamic capabilities. *Organ. Sci.* **13**(3): 339-351.

**Table 1. Descriptive statistics**

|   | Scale | Mean | Std. Dev. | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   | 13   | 14   | 15   | 16   | 17   | 18   | 19   | 20   | 21   | 22  | 23  | 24  |
|---|-------|------|-----------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----|-----|-----|
| 1. Closeness of existing technical capabilities             | 1-7   | 4.99 | 1.41      | 1    |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |     |     |     |
| 2. Strength of existing technical capabilities              | 1-7   | 5.17 | 1.44      | .59  | 1    |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |     |     |     |
| 3. Closeness of existing marketing capabilities             | 1-7   | 4.35 | 1.43      | .32  | .17  | 1    |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |     |     |     |
| 4. Strength of existing marketing capabilities              | 1-7   | 4.48 | 1.65      | .23  | .34  | .68  | 1    |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |     |     |     |
| 5. Familiarity with customer in targeted capability area    | 1-7   | 5.36 | 1.24      | .29  | .39  | .45  | .46  | 1    |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |     |     |     |
| 6. Fit of targeted capabilities with firm's systems         | 1-7   | 4.64 | 1.47      | .21  | .17  | .26  | .27  | .09  | 1    |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |     |     |     |
| 7. Fit of incentive systems to hire new people              | 1-7   | 4.41 | 1.51      | -.06 | .07  | .15  | .15  | .03  | .53  | 1    |      |      |      |      |      |      |      |      |      |      |      |      |      |      |     |     |     |
| 8. Fit of incentive systems to integrate newly-hired people | 1-7   | 4.48 | 1.47      | .10  | .12  | .23  | .34  | .05  | .45  | .37  | 1    |      |      |      |      |      |      |      |      |      |      |      |      |      |     |     |     |
| 9. Little competition with targeted capabilities            | 1-7   | 4.78 | 1.48      | .14  | .05  | .08  | .08  | .08  | .34  | .04  | .06  | 1    |      |      |      |      |      |      |      |      |      |      |      |      |     |     |     |
| 10. Little internal resistance for targeted capabilities    | 1-7   | 4.63 | 1.43      | .07  | .07  | .08  | .11  | .13  | .32  | .02  | .12  | .68  | 1    |      |      |      |      |      |      |      |      |      |      |      |     |     |     |
| 11. Firm size   | 1-5   | 3.41 | 1.59      | .03  | -.01 | .03  | .01  | -.01 | -.21 | -.18 | -.06 | -.19 | -.10 | 1    |      |      |      |      |      |      |      |      |      |      |     |     |     |
| 12. Firm age  | 1-5   | 3.96 | 1.20      | .10  | .25  | .14  | .19  | .16  | -.11 | -.16 | -.14 | -.08 | .04  | .32  | 1    |      |      |      |      |      |      |      |      |      |     |     |     |
| 13. Firm geographic scope                                   | 1-3   | 2.07 | .88       | .14  | .28  | .00  | -.01 | .02  | -.11 | -.11 | -.08 | .05  | .07  | .49  | .43  | 1    |      |      |      |      |      |      |      |      |     |     |     |
| 14. Firm R&D Investment/sales                               | 1-5   | 2.68 | 1.38      | .19  | .21  | -.05 | -.08 | -.07 | -.06 | -.03 | -.09 | .00  | -.13 | .09  | .06  | .44  | 1    |      |      |      |      |      |      |      |     |     |     |
| 15. Firm Advertising Investment/sales                       | 1-5   | 2.14 | 1.16      | -.02 | -.15 | .08  | .10  | -.13 | .04  | .16  | .19  | -.15 | -.15 | .19  | -.28 | -.05 | .18  | 1    |      |      |      |      |      |      |     |     |     |
| 16. Firm return on equity                                   | 1-5   | 3.08 | 1.47      | .00  | .12  | .06  | .02  | .18  | -.09 | -.04 | .05  | -.17 | .03  | .12  | .21  | .16  | .07  | .01  | 1    |      |      |      |      |      |     |     |     |
| 17. Firm privately-owned                                    | 0/1   | .47  | .50       | -.03 | -.11 | .02  | .05  | .04  | .19  | .18  | .09  | .18  | .13  | -.44 | -.24 | -.40 | -.02 | -.05 | -.04 | 1    |      |      |      |      |     |     |     |
| 18. Firm stock-listed                                       | 0/1   | .49  | .50       | -.02 | .21  | -.07 | .02  | -.04 | -.06 | .02  | -.10 | -.15 | -.05 | .30  | .23  | .33  | .02  | -.03 | -.05 | -.79 | 1    |      |      |      |     |     |     |
| 19. Importance of regulation on firm strategy               | 1-5   | 3.45 | .97       | -.19 | -.22 | -.12 | -.05 | -.07 | -.18 | -.07 | -.04 | -.11 | -.01 | -.05 | -.09 | -.28 | -.24 | .07  | -.07 | -.03 | .00  | 1    |      |      |     |     |     |
| 20. Firm from Europe  | 0/1   | .52  | .50       | .12  | .02  | -.03 | .00  | -.01 | -.15 | -.20 | .18  | .12  | -.08 | .37  | -.03 | .45  | .34  | .15  | -.08 | -.09 | -.22 | -.20 | 1    |      |     |     |     |
| 21. Firm - Outside Europe and US                            | 0/1   | .09  | .29       | .08  | -.02 | .07  | -.01 | -.09 | .02  | -.05 | -.03 | .00  | -.08 | .04  | .01  | -.10 | -.09 | .05  | .21  | -.08 | -.09 | -.12 | -.41 | 1    |     |     |     |
| 22. Firm ability to obtain targeted R&D capabilities        | 1-7   | 4.64 | 1.39      | .31  | .35  | .09  | .11  | .11  | .01  | .02  | .16  | -.15 | -.17 | -.06 | .08  | .13  | .20  | -.17 | .18  | -.02 | .09  | .04  | -.04 | .07  | 1   |     |     |
| 23. Firm ability to obtain targeted IT capabilities         | 1-7   | 4.33 | 1.31      | .13  | .07  | .10  | .12  | .06  | .19  | .32  | .17  | -.20 | -.20 | -.11 | -.02 | -.15 | .00  | .03  | -.08 | .11  | -.05 | .05  | -.14 | .11  | .40 | 1   |     |
| 24. Firm ability to obtain targeted marketing capabilities  | 1-7   | 4.37 | 1.41      | .01  | .05  | .39  | .38  | .24  | .21  | .19  | .23  | .04  | .02  | .01  | -.06 | -.10 | -.11 | .03  | .04  | .22  | -.13 | -.03 | .12  | -.11 | .10 | .21 | 1   |
| 25. Firm survival   | 1-3   | 2.38 | .84       | .02  | -.01 | .15  | .11  | -.09 | .09  | -.13 | .11  | -.02 | -.01 | -.05 | .08  | -.15 | -.23 | .09  | .04  | .03  | -.16 | .03  | -.14 | .04  | .08 | .12 | .02 |

**Table 2. Measurement Model**

|   | Internal consistency <sup>1</sup> | Average variance extracted <sup>2</sup> | Correlations between latent variables <sup>3</sup> |                   |         |         |          |
|---|-----------------------------------|---|--|-------------------|---------|---------|----------|
|   |                                   |   | $\xi_1$  | $\xi_2$           | $\xi_3$ | $\xi_4$ | $\eta_1$ |
| <b>Latent variables</b>   |                                   |   |  |                   |         |         |          |
| ( $\xi_1$ ) Capability constraints: Distance from existing technical capabilities   | 0.98                              | 0.97                                    | 0.98   |                   |         |         |          |
| ( $\xi_2$ ) Capability constraints: Distance from existing marketing capabilities   | 0.85                              | 0.66                                    | 0.45   | 0.81              |         |         |          |
| ( $\xi_3$ ) Internal social constraints: Fit with systems                           | 0.91                              | 0.63                                    | 0.23   | 0.37              | 0.79    |         |          |
| ( $\xi_4$ ) Internal social constraints: Social acceptance of targeted capabilities | 0.98                              | 0.97                                    | 0.14   | 0.16              | 0.37    | 0.98    |          |
| ( $\eta_1$ ) Firm's ability to create the targeted capabilities                     | 0.90                              | 0.76                                    | 0.38   | 0.33              | 0.34    | -0.31   | 0.87     |
| <i>Measurement paths</i>  |                                   | Parameter                               | Unstandardized                                     | Critical ratio    |         |         |          |
|   |                                   | s                                       | Estimates  | (Estimate/SE) (1) |         |         |          |
| ( $\xi_1$ ) Capability constraints: Distance from existing technical capabilities   |                                   |   |  |                   |         |         |          |
| • Closeness of existing technical capabilities                                      |                                   | $\lambda_{x11}$                         | 0.98   |                   |         |         | 4.96***  |
| • Strength of existing technical capabilities                                       |                                   | $\lambda_{x21}$                         | 1.00   |                   |         |         | Fixed    |
| ( $\xi_2$ ) Capability constraints: Distance from existing marketing capabilities   |                                   |   |  |                   |         |         |          |
| • Closeness of existing marketing capabilities                                      |                                   | $\lambda_{x32}$                         | 0.82   |                   |         |         | 8.26***  |
| • Strength of existing marketing capabilities                                       |                                   | $\lambda_{x42}$                         | 1.00   |                   |         |         | Fixed    |
| • Familiarity with customer in targeted capability area                             |                                   | $\lambda_{x52}$                         | 0.55   |                   |         |         | 6.48***  |
| ( $\xi_3$ ) Internal social constraints: Fit with systems                           |                                   |   |  |                   |         |         |          |
| • Fit of targeted capabilities with firm's systems and culture                      |                                   | $\lambda_{x63}$                         | 1.00   |                   |         |         | Fixed    |
| • Fit of incentive systems to hire new people                                       |                                   | $\lambda_{x73}$                         | 0.70   |                   |         |         | 5.83***  |
| • Fit of incentive systems to integrate newly-hired people                          |                                   | $\lambda_{x83}$                         | 0.62   |                   |         |         | 5.46***  |
| ( $\xi_4$ ) Internal social constraints: Social acceptance of targeted capabilities |                                   |   |  |                   |         |         |          |
| • Development of needed capabilities triggered little or no internal competition    |                                   | $\lambda_{x93}$                         | 0.98   |                   |         |         | 5.98***  |
| • Development of needed capabilities triggered little or no internal resistance     |                                   | $\lambda_{x103}$                        | 1.00   |                   |         |         | Fixed    |
| ( $\eta_1$ ) Firm's ability to obtain the targeted capabilities                     |                                   |   |  |                   |         |         |          |
| • R&D capabilities  |                                   | $\lambda_{y11}$                         | 1.00   |                   |         |         | Fixed    |
| • IT capabilities   |                                   | $\lambda_{y21}$                         | 0.99   |                   |         |         | 4.06***  |
| • Marketing capabilities  |                                   | $\lambda_{y31}$                         | 0.55   |                   |         |         | 2.86***  |

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

<sup>1</sup> Internal consistency =  $(\sum \lambda_{yi})^2 / [(\sum \lambda_{yi})^2 + \sum (1 - \lambda_{yi}^2)]$ . 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.

<sup>2</sup> Average variance extracted (AVE) =  $\sum \lambda_{yi}^2 / [\sum \lambda_{yi}^2 + \sum (1 - \lambda_{yi}^2)]$ . 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.

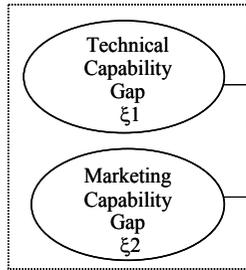
<sup>3</sup> The on-diagonal elements are the square root of the average variance extracted (AVE), which assesses discriminant validity (Fornell and Larcker, 1981).

## Structural Model Results

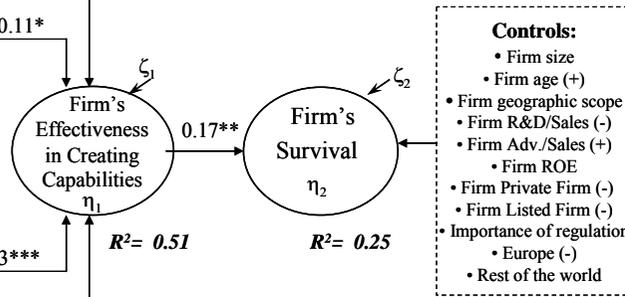
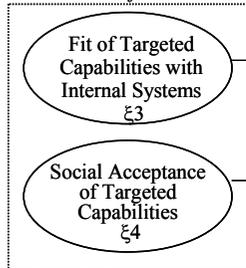
Figure 1a-

Figure 1b-

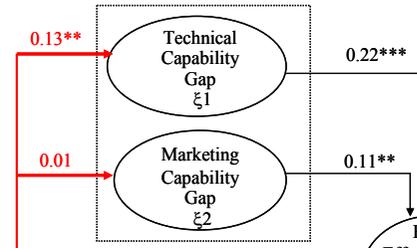
Use of internal development vs. external sourcing based on capability gap



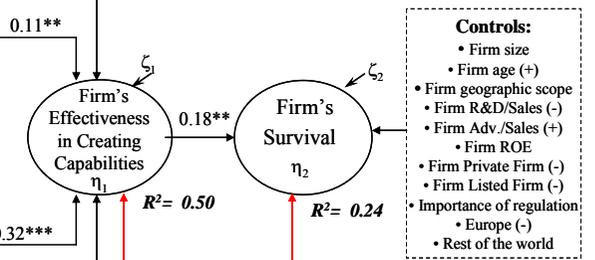
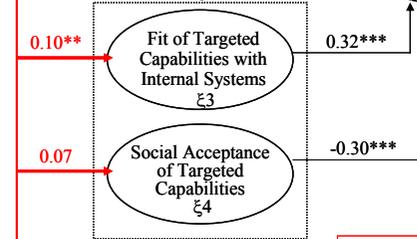
Use of internal development vs. external sourcing based on firm's internal frictions



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



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



Joint Experience in Internal Dev. & External Sourcing

\*\*\*  $p < 0.01$ ; \*\*  $p < 0.05$ ; \*  $p < 0.10$  (two-tailed tests)

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