

The Strength of Churning Ties:

Tie Portfolios, Tie Interdependence, and the Dynamics of Interorganizational Relationships*

SERGIO G. LAZZARINI

Ibmec São Paulo

R. Quatá 300

São Paulo, SP Brazil 04546-042

Phone: 55-11-4504-2433; Fax: 55-11-4504-2350

E-Mail: SergioGL1@isp.edu.br

TODD R. ZENGER

John M. Olin School of Business – Washington University

1 Brookings Drive, Campus Box 1133

St. Louis, MO 63130-4899

Phone: 314-935-6399; Fax: 935-6359

E-Mail: zenger@olin.wust.edu

August 2007

* Some concepts in this paper build on joint work with Jackson Nickerson. His suggestions and comments are particularly acknowledged. We also thank Lyda Bigelow, Chih-Mao Hsieh, Kyle Mayer and Gary Miller for insightful comments and critical suggestions. A preliminary version of this paper was presented in the 2002 Academy of Management Conference and also benefited from comments by anonymous referees. Remaining errors and omissions are our own.

The Strength of Churning Ties:

Tie Portfolios, Tie Interdependence, and the Dynamics of Interorganizational Relationships

Abstract

Firms often seek to promote cooperation in sourcing a particular product or activity by developing strong ties with one or more partners. At the same time, however, firms maintain weak ties with others to provide constant access to new opportunities. Thus, firms often manage sourcing by maintaining a portfolio of ties. However, the metaphor of a portfolio is problematic when elements of the portfolio are not independent, which is precisely the case with a portfolio of exchange ties. To effectively access a weak tie, the firm must strengthen it; by doing so, however, the firm undermines other existing strong ties. We propose a theory to explain the emergence and dynamics of these “churning” ties. Also, we describe how distinct managerial interventions influence the speed at which tie strength changes over time, and outline factors that affect the lag between these interventions to change tie strength.

Keywords

Networks, interorganizational relationships, strategic alliances, cooperative strategy.

Interest in the strategic use of interorganizational networks has grown significantly in recent years. Effective management of interorganizational ties enables firms to access knowledge and develop relationship-specific investments while avoiding costly vertical integration (Asanuma, 1989; Holmstrom and Roberts, 1998; Jarillo, 1988). Following Granovetter's (1973) seminal work, an important debate in this literature centers on how the "strength" of interfirm ties influences the benefits that firms reap from network partners. While a long-term exchange or "strong" tie promotes cooperation, an arm's-length exchange or "weak" tie is easily established and easily severed, thus enabling access to new relationships that may yield cost reduction or innovation. Distinct conditions might therefore make strong ties preferred to weak ties, or vice-versa. For instance, while exchanges involving relationship-specific assets require strong ties to mitigate the contractual hazards arising from specific investments, simple exchanges that do not require specialized assets can be managed through a series of weak ties, i.e., arm's-length relations with multiple firms (e.g. Dyer et al., 1998; Williamson, 1985).

In many situations, however, firms may face contingencies that require, at the same time, *both* weak and strong ties. For instance, if a particular supply exchange requires both relationship-specific investments and flexibility to be responsive in an environment where the production technology is rapidly evolving (Harrigan, 1988; Koka et al., 2006; Rowley et al., 2000), then managers may seek a *portfolio* of ties, appropriately balanced with weak and strong ties (e.g. Faulkner, 1983; Hite and Hesterly, 2001; Uzzi, 1996). While strong ties generate the requisite cooperation, weak ties provide firms with the flexibility to explore new exchange opportunities. For instance, a firm may devote a large portion of its purchases to a particular supplier with which it has repeatedly exchanged, yet still maintain relations with alternative suppliers to "test the market" (Eccles, 1981: 353). We contend, however, that the conceptualization of exchange ties as a portfolio to be balanced as a solution to conflicting contingencies is problematic, because the elements in these portfolios are highly interdependent. Managerial decisions to invest in one set of ties profoundly influence outcomes within another. To effectively access new opportunities brought by weak ties, firms must signal commitment to these new partners. Absent these signals, these new partners will be reluctant to invest in relationship-specific resources. However, these

same signals undermine existing commitments to previous partners, thus triggering a process of tie weakening (e.g. Helper, 1991; Jones et al., 1998; Singh and Mitchell, 1996).

Therefore, the management of a portfolio of ties intended to balance cooperation and flexibility is not a simple exercise of “diversifying” the contributions of distinct sets of ties.¹ Instead, ties are interdependent. Consequently, the mere act of accessing certain ties in the portfolio causes change in the strength of other ties. We lack a theory that satisfactorily explains these tie portfolio dynamics and addresses how managers can achieve the desired balance of cooperation and flexibility. In this paper we fill this void by developing such a dynamic theory. We argue that often the manager’s job is not to statically develop a portfolio of weak and strong ties, but rather to dynamically manage tie strength across a set of highly interdependent ties.² Our theory shows that, under conditions normally discussed in the literature, ties are unlikely to remain neatly categorized as either permanently strong or permanently weak. Instead, ties are likely in a state of constant *churn*: some are developing, others are unraveling, while still others are severed completely, and all in a highly interdependent way. The effective management of tie portfolios therefore requires periodic interventions to escalate some ties and deal with the unraveling of others. Besides discussing conditions for the emergence of churning ties, our theory also describes how distinct managerial interventions differ in the speed in which tie strength changes over time and presents factors that affect the lag between these interventions to change tie strength.

Our model also explains why interorganizational ties shift in strength over time, even when exchange or environmental conditions are stable. Longitudinal studies of buyer-supplier alliances, for instance, show that buyers often start weak ties with suppliers, develop those ties, and then later downplay them in favor of other potential partners that emerge over time (Capaldo, 2007; Gadde and Mattsson, 1987). The same pattern has been observed in other distinct contexts such as banks and their corporate clients (Eccles and Crane, 1988) and artists in the movie industry (Faulkner, 1983). Put simply, the conceptual portrait

¹ The complications here are not unlike those faced by a CEO trying to manage a diverse set of businesses as a portfolio. Many of the same critiques levied at the application of portfolio theory to corporate strategy have application here, as well. In particular, the diverse businesses in a corporate portfolio are often also highly interdependent.

of ties statically matched in strength to exchange conditions commonly found in the literature, is far from what is observed in practice. And whenever change in tie strength is acknowledged by scholars, it is often treated as a pathological manifestation of network instability (e.g. Dyer et al., 1998: 73).

Differently from this view, we contend that repeated intervention to adjust tie strength may be necessary to manage tie portfolios.

The paper is structured as follows. In the next section, we review the literature relating tie strength to performance and associated contingency-based arguments suggesting conditions that might affect the choice of an optimal tie strength. We next outline key assumptions that collectively imply the emergence of churning ties, and describe the logic of periodically changing tie strength. In the sequence, we describe how distinct managerial interventions to weaken or reinforce ties affect the speed at which tie strength changes over time. Next we discuss factors that may affect the lag between periodic managerial interventions to change the strength of ties. Concluding remarks follow.

TIE STRENGTH: TRADEOFFS AND CONTINGENCY-BASED ARGUMENTS

Strong *versus* weak ties

Strong ties in an interorganizational setting involve long-term, recurring, committed relationships between two firms. Strong ties provide patterns of interaction that deliver long time horizons of expected exchange which, as relationships unfold, generate long histories of prior exchange (e.g. Gulati, 1995a; Ring and Van de Ven, 1994). In this sense, the primary benefit of strong ties is that they provide the necessary social “embeddedness” (Granovetter, 1985; Uzzi, 1996) to promote *cooperation* in an exchange. High expectations of relationship continuity provide a “shadow of the future” to discourage opportunism, meaning that the long-term payoff from cooperation surpasses the short-term payoff from defection (Anderson and Weitz, 1992; Axelrod, 1984; Heide and Miner, 1992). Elements emanating from a long history of exchange further reinforce the cooperation-based benefits of strong ties. Repeated interaction and familiarity also create a “shadow of the past” which promotes the emergence of relational

² Our arguments here have some parallels with the logic presented in Nickerson and Zenger (2002).

governance based on social attachments, trust, and norms (Gulati, 1995a; Larson, 1992; Macneil, 1980; Ring and Van de Ven, 1994).

Strong ties, however, exhibit key disadvantages. Fundamentally, ties of weaker strength provide *flexibility*. By using weak ties which are shorter-term and more “arm’s-length,” managers flexibly access new knowledge and new exchange opportunities with alternative firms (Granovetter, 1973). Indeed, the absence of a strong tie is what frees the manager to access new, weak ties. As a result, firms more flexibly exchange with a variety of firms which possess unique specialized knowledge and capabilities (Granovetter, 1982; Richardson, 1972; Schilling and Steensma, 2001). The maintenance of weak ties also circumvents potentially dysfunctional incentives unleashed by the escalating commitment of strong ties. Continuous interaction with the same partners restricts firms’ exposure to new ideas and knowledge (Adler and Kwon, 2002; McFadyen and Cannella Jr., 2004; Uzzi, 1996). Severing the existing ties may be critical to adaptation and change in response to a shifting environment (Afuah, 2000; Grabher, 1993; Kern, 1998). Firms with strong supplier ties are less likely to pursue attractive alternative suppliers, if pursuing these opportunities threatens existing ties or violates existing social obligations (Gargiulo and Benassi, 2000; Halpern, 1994; Jeffries and Reed, 2000).

Contingency-based arguments

The simple recognition that strong ties support cooperation, while weak ties provide flexibility has sparked a flurry of research in the literature examining *contingencies* that call for more or less tie strength. One research stream suggests that tie strength should be matched to *exchange* conditions. Thus, transaction cost economics posits that the need for relationship-specific assets in an exchange requires strong ties to reduce the hazards of opportunistic behavior. However, absent these relationship-specific assets, weaker ties provide sufficient governance (Williamson, 1985). Social exchange theorists (Cook and Emerson, 1978; Kollock, 1994; Yamagishi et al., 1998) and organizational economists (Barzel, 1982; Holmstrom and Milgrom, 1994) highlight measurement difficulty as an additional determinant of tie strength. When exchange performance is difficult to measure, long term ties are preferred. Other scholars point to the nature of knowledge being transferred in an exchange as a determinant of tie

strength. Thus, the transfer of tacit, complex knowledge requires strong social ties, while the transfer of codified knowledge is well suited to weak ties (Hansen, 1999; von Hippel, 1994).

Still other theories propose a fit between tie strength and *environmental* conditions. Drawing from the concepts of exploration, the search for new resources, and exploitation, the use of existing resources (Koza and Lewin, 1998; Levinthal and March, 1993; March, 1991), Rowley et al. (2000) propose that tie strength should be matched to the characteristics of an industry. Industries characterized by high technological uncertainty require the flexibility and exploration provided by weak ties, while stable industries warrant the cooperation-enhancing properties and exploitation provided by strong ties (see also Harrigan, 1988; Schilling and Steensma, 2001). Some authors also emphasize the role of market-level uncertainty, such as volatile demand, favoring transactions with many firms to absorb temporary supply or demand shocks (Eccles, 1981; Jones et al., 1997; Kranton and Minehart, 2000). In a similar vein, Koka et al. (2006) propose that increases in environmental uncertainty and resource scarcity (e.g., increased competition) magnify the need for new tie creation (and old tie deletion) in a network because firms will need to draw on new critical resources and adapt to changing conditions.³

Conflicting contingencies

The composition of a firm's portfolio of ties should thus depend on the composition of the contingencies faced by the firm, as discussed above. To illustrate, please refer to Figure 1, which depicts how networks may evolve depending on the combination of two sets of contingencies: those that favor the formation of strong ties (asset specificity, difficulty to measure exchange attributes, or knowledge tacitness), and those that favor the formation of weak ties (high technological or demand uncertainty). The left-upper and right-lower quadrants correspond to situations where matching tie strength to contingencies is an easy task. If, say, asset specificity is low and technological uncertainty is high, then the firm should pursue a series of changing weak ties (e.g., a buyer procuring through an auction mechanism). If asset specificity is high and technological uncertainty is low, then the firm should

develop one or few extended strong ties (e.g., a buyer devoting a high portion of its procurement to a long-term supplier). The left-lower quadrant also involves a situation that can be easily managed through a set of extended weak ties (e.g., a buyer procuring from several permanent suppliers). Our focus is on situations of *conflicting contingencies*—the upper right, where circumstances call for a portfolio of ties that generates *both* cooperation and flexibility.

Managers face a critical dilemma when their firms are subject to these conflicting contingencies. Research suggests such circumstances are not uncommon. For instance, Afuah (2000: 389) in analyzing the microprocessor industry asserts that in the advent of technological change “staying with the old supplier means that the manufacturer can build on existing close relationships, but must grapple with the problems that the supplier faces in making the transition to the new technology. If the change is radical enough to suppliers, they may not be able to supply components with the type of quality that the firm needs to be competitive with the new technology.” Or, consider a service relationship that requires both a high degree of customization and enough flexibility to explore opportunities brought by alternative service providers. Thus, in their study of investment banking, Eccles and Crane (1988) find that corporate clients want both customized service, which requires long-term collaboration, and flexibility to freely exploit arbitrage opportunities, which implies less frequent deals with the same bank. Eccles and Crane (1988: 55) conclude that banks and their customers often “want the advantages of [long-term] relationships *and* the advantages of a more transactional [arm’s-length] orientation” (emphasis in the original).

<<Figure 1 around here>>

In the presence of such conflicting demands, one expects firms to create a *portfolio* of weak and strong ties that balances some strong ties with their cooperation-based advantages and some weak ties with their flexibility-based advantages. In other words, firms could exploit their existing, recurring relationships and keep their options open to explore new opportunities with their loose contacts.

³ Koka et al. (2006) also label this process of tie increase and deletion as “churning.” Our usage of the term, however, is more general: churning, in our definition, involves a process of tie weakening (which may occur even if

Empirical evidence shows indeed that firms often develop committed, long-term relationships with some partners, and engage in arm's-length exchanges with a large number of other firms. Thus, Uzzi (1996: 684) hypothesizes and finds evidence that "networks consisting of a mix of arm's-length and embedded ties have the greatest adaptive capacity." In his extensive analysis of relationships among musicians and film producers in Hollywood, Faulkner (1983: 199) finds that "freelancers with both one-shot alliances and long-run partnerships outperform their colleague competitors." Also, maintaining weak ties with a set of alternative suppliers allows the buyers to access new exchange opportunities (Capaldo, 2007) and prompts incumbent suppliers to pursue price cuts (Eccles, 1981).

We contend, however, that this conceptualization of tie portfolios as a solution to conflicting contingencies is inappropriately simplistic. It ignores the important interdependence among ties, as elements of this portfolio; accessing a weak tie, for instance, should profoundly influence *existing* strong ties in the portfolio. We discuss below how the inherent difficulty associated with maintaining a static portfolio of weak and strong ties requires period managerial interventions to change tie strength, thereby leading to churning ties.

CHURNING TIES: EMERGENCE AND DYNAMICS

Our unit of analysis is a firm's ego network (e.g. Dyer and Singh, 1998), comprised of a set of actual and potential partners (contacts) providing access to a *particular* product, service, or knowledge. Notice therefore that we are not considering broad networks where ties may involve diversified activities; rather, our network is circumscribed within a particular exchange domain (e.g., the procurement of a particular product, or the development of alternative technologies for a similar use). Our focus is on those settings where an exchange is potentially (although not necessarily) recurring; otherwise, the analysis of tie strength becomes rather immaterial.⁴ Also, we consider situations where conflicting contingencies

a tie is not deleted) and tie strengthening (which may occur even if no new tie is created).

⁴ This assumption rules out one-shot transactions such as when a firm acquires standard machinery (Williamson, 1985). In such cases, exchange is occasional and thus the likelihood that parties will be able to meet in the future is negligible. At first glance, project collaborations with finite duration may appear to fall into this category.

mandate the joint use of weak and strong ties, which pose formidable challenges to the management of tie portfolios.

Interdependencies among ties in the portfolio

Studies proposing tie portfolios as a way to balance cooperation and flexibility implicitly assume that an investment in one tie has no bearing on the strength of another. We consider instead that ties in a portfolio are *interdependent*: changing the level of strength of a particular tie prompts changes in the strength of other ties. Specifically, accessing a weak tie profoundly influences existing strong ties in the portfolio. To effectively access new opportunity in its portfolio of ties, the firm must devote diverging time and effort towards new partners instead of projects where incumbent partners are involved. Thus, the mere act of cultivating an alternative partner alters perceptions of the likely longevity of other ties, thereby redefining the shadow of the future (Jones et al., 1998). Initiating even a limited exchange with a new partner risks “offending an important current partner” (Singh and Mitchell, 1996: 112). Thus, as a previously weak tie strengthens, existing strong ties weaken. Eccles and Crane (1988: 58) illustrate such self-reinforcing dynamics in the context of the investment banking industry:

... when the customer can choose from among a group of investment banks, a profound change takes place in the expectations each has about the future... Because a relationship is based on both transactions and the *expectation* of future transactions, uncertainty about the future diminishes the quality of the relationship... The customer’s unwillingness to share information with the investment bank beyond what is necessary to do a particular deal further diminishes the quality of the relationship. When interaction between deals decreases, the relative significance of transactions decreases, further reinforcing the perception of an increased transactional [arms’ s-length] orientation on the part of the customer” (emphasis in the original).

Downgrading current partners can also severely damage a firm’s reputation (Podolny and Page, 1998), making it more difficult to access *new* partners. For instance, Helper (1991: 820) documents that

However, most exchanges of this sort actually involve a *series* of project collaborations. Consider the movie industry: although the production of a movie has a finite horizon, parties oftentimes continue their relationship in

U.S. automakers created a “legacy of mistrust” with their suppliers through ongoing solicitation of competing bids. Sellers who transact with a buyer who has downgraded or discontinued prior supply arrangements should not expect committed relationships with that buyer (Srinivasan and Brush, 2006). Thus, constantly accessing potential partners not only weakens existing strong ties, but also indicates to potential partners that the firm often fails to commit. The firm will thus need to employ mechanisms to signal commitment and strengthen its ties to new partners. Further strengthening these new ties, however, merely unravels existing strong ties.

The dynamics of churning ties

The assumption of tie interdependence implies that a portfolio of weak and strong ties in the context of conflicting contingencies is necessarily fluid and unstable. Managers cannot simply adopt an optimal balance of strong and weak ties, because the sheer use of weak ties threatens and undermines the strong ties. Mixing weak and strong ties will not be enough; to simultaneously benefit from actual and potential partners, the firm will need to employ managerial interventions to change the strength of ties in the network. Were those interventions costless, the problem of the firm would be trivial: the firm would quickly cultivate a weak tie when an opportunity emerges, benefit from the new opportunity, and then do the same with other potential partners at a very high rate. The mechanisms that the firm must employ to adjust tie strength are, however, costly. As discussed previously, unraveling existing ties may damage a firm’s reputation (Helper, 1991: 820; Podolny and Page, 1998). Likewise, to credibly commit to a recurring interaction and strengthen ties, firms must often employ costly mechanisms such as long-term contracts (Poppo and Zenger, 2002) or joint ownership (Pisano, 1989; Williamson, 1985).

Therefore, decisions to adjust tie strength must be balanced against the costs of such change. Due to these costs, the firm will wait until the benefits of accessing new ties exceed the perceived costs of the necessary changes in the network. The firm maintains its long-term partners until new opportunities emerge that are sufficiently attractive to outweigh these costs. When this happens, existing weak ties or contacts will be accessed, prompting a change in the strength of ties in the network. While a previously

subsequent projects (Faulkner, 1983).

strong tie weakens, the firm employs deliberate and costly mechanisms to strengthen the new tie. The newly built relationship then remains strong, until the firm perceives a new exchange opportunity that is valuable enough to surpass the costs of change. If perceived costs are high (e.g., the firm faces severe reputation losses that would require costly mechanisms to overcome in strengthening new ties), then the network remains steady for an extended period of time until once again change occurs. *Churning ties* result: periodically, some ties escalate, while other ties unravel. The right-upper quadrant in Figure 1 illustrates the dynamics of churning ties. This logic leads to our first and central proposition:

Proposition 1: Conflicting contingencies, interdependencies among ties in a portfolio, and positive costs to change tie strength will lead to churning ties: rather than exhibiting a static configuration of tie strength, the tie portfolio will be subject to periodic managerial interventions such that some ties will strengthen while others will weaken.

Two key aspects will characterize the dynamics of churning ties. First, the *speed* by which ties weaken and strengthen in the portfolio, as determined in part by distinct organizational mechanisms which differ in the rate in which they escalate or unravel ties. Second, the *lag* between successive managerial interventions to churn ties: several factors will influence the costs and benefits to periodically adjust tie strength and will therefore affect the frequency with which managers intervene in the portfolio. We discuss each in turn.

THE PACE OF CHURNING: MANAGERIAL INTERVENTIONS AND THE SPEED OF CHANGE IN STRENGTH

We do not view managers as passive actors merely observing the dynamics of their firm's portfolio of ties, but rather as active in shaping this portfolio. The mechanisms available for managers to intervene and change tie strength differ in two ways. First, they differ in whether they promote the strengthening or weakening of a *particular* tie, and they differ in the resulting pace of change. Second, such mechanisms, which may target a particular tie, have spillover effects on other ties in the portfolio. The pace at which

these mechanisms affect these other ties will, of course, depend on the pace at which the mechanisms alter the strength of the targeted ties.

Consider the available managerial mechanisms to increase tie strength. At a minimum, the focal firm can communicate an intent to cooperate (Bottom et al., 2002) and sign narrow agreements based on particular projects to “test the relation” (Rauch and Watson, 2003). While such loose efforts are inexpensive to initiate, they are likely to increase tie strength at a very slow pace—and may even be ineffective if the firm has developed a reputation for frequent switching. Broader, longer-term contracts take a step further by formally bonding parties in a recurring relationship or restricting exchange with alternative firms, such as in the case of exclusivity agreements. The degree of commitment enabled by long-term contracts is stronger than in the case of loose agreements since the former explicitly defines the extent of repeated interaction. However, the anticipation of future events, the establishment of procedures to respond to such events and the enforcement of contractual clauses engender major challenges and costs for the implementation of long-term contractual relations (Crocker and Masten, 1991; Joskow, 1988). An even stronger way to signal commitment is the use of joint ownership, such as mutual investments in idiosyncratic assets and joint equity stakes in common organizations (e.g., joint ventures). Joint ownership will require large up front investments, most of which will likely be sunk in the form of dedicated assets and organizational structures (Doz and Hamel, 1998; Harrigan, 1988). Nonetheless, it is precisely these investments that make exit costly and thus strongly promote commitment (Anderson and Weitz, 1992; Weiss and Kurland, 1997; Williamson, 1985; Young-Ybarra and Wiersema, 1999).

Therefore, in order of increasing effect, loose contractual intentions, long-term contracts and joint ownership strengthen weak ties. However, their application also affects other ties in a portfolio. For instance, existing partners may perceive an increased risk of losing future exchange which undermines existing strong ties. The effect on existing strong ties will likely depend directly on the means adopted to strengthen weak ties. Thus, existing strong ties are likely to experience greater damage when the firm establishes joint ownership with an alternative partner than when the firm simply writes a letter of intent with that same partner. By making exit more costly, joint ownership signals strong commitment to new

partners and therefore makes it very likely that new deals will be concentrated on new partners rather than existing ones. Thus, mechanisms that quickly strengthen new ties will also rapidly reduce the propensity of existing partners to cooperate. This logic leads to:

Proposition 2: Within a portfolio of weak and strong ties, the use of loose contractual arrangements, long-term contracts and joint ownership to strengthen a particular weak tie will affect, in increasing order, not only the speed at which that tie strengthens, but also the speed at which existing strong ties unravel.

Managers can also employ mechanisms that diminish the strength of existing ties which they deem less valuable. The least aggressive mechanism involves reorganizing the relationship governance through formal changes in the structure of interaction between firms. Managers can renegotiate or reallocate ownership stakes in a joint equity arrangement (Blodgett, 1992). They can also adjust contractual clauses, such as the duration of the contract, and modify monitoring procedures (Reuer et al., 2002).

Alternatively, managers can bilaterally negotiate the termination of the partnership. This occurs when partners recognize that new exchange opportunities provide substantially greater gains than existing exchanges (Doz and Hamel, 1998). However, reaching agreeable terms for bilateral termination can be in some cases by infeasible (Inkpen and Ross, 2001: 143). A more radical option is to unilaterally terminate the partnership, by which managers deliberately dissolve a long-term tie or open the relationship to alternative firms. Mandating that procurement transactions will be managed through an Internet “business-to-business” auction may have this precise effect (Lucking-Reiley and Spulber, 2001; Wise and Morrison, 2000).

Thus, in order of increasing effect, alliance reorganization, bilateral termination, and unilateral termination increase the speed at which existing ties are weakened.⁵ However, as before, each mechanism will have distinct consequences for other ties in the portfolio. Thus, the desire of a firm to keep an exchange partner and simply reorganize the terms of the relationship should signal a higher

propensity to develop a continuous relationship than the downright, unilateral severance of a tie. Current and future partners will be unwilling to cooperate if they learn that the firm has a reputation of destroying ties at its discretion. Mechanisms that weaken existing ties at a higher speed will therefore make it more difficult to cultivate other ties. Consequently:

Proposition 3: Within a portfolio of weak and strong ties, the use of relationship reorganization, bilateral termination, and unilateral termination to weaken a strong tie will affect, in an increasing order, not only the speed at which that tie weakens, but also the necessary time to strengthen another tie in the future.

The pace at which ties strengthen and unravel is likely asymmetric. The difficulty of building relationships or restoring existing ones is well known (Bottom et al., 2002; Helper, 1991). Considerable time and effort is necessary to create a trusting environment and elicit cooperation from partners (Mesquita, 2007). Although, as indicated before, firms can accelerate tie strengthening, considerable time is likely required between initial conversations and a well functioning cooperative relationship. In contrast, the process of tie weakening tends to be quite rapid and thorough. As put by Bottom et al. (2002: 497), “actions that violate cooperative expectations can have serious consequences. Minor departures may foster concern. Major departures may be perceived as exploitation, generate strong emotional reactions, and can sever relationships so that future benefits are lost.” Consequently, cooperation will tend to unravel: partners, for instance, may reduce product quality or refuse to promote further relationship-specific investments. Recognition of this asymmetry leads to:

Proposition 4: Within a portfolio of weak and strong ties, weakening strong ties occurs more rapidly than strengthening weak ties.

FACTORS INFLUENCING THE LAG BETWEEN PERIODIC MANAGERIAL INTERVENTIONS TO CHANGE TIE STRENGTH

⁵ When managers sever an existing tie, then the firm will not have an ongoing business transaction with that particular partner. In this case, however, we consider that a very weak tie will remain, given that, at least, the firm

The assumption that there are non-negligible costs to changing tie strength implies that managers will precisely choose the timing of managerial interventions to the portfolio of ties. We describe below several factors that alter the benefits and costs of changing ties and thereby influence the periodicity of these managerial interventions.

Portfolio-specific factors

A critical portfolio-specific attribute is the *number of partners* in the portfolio. This number includes not only those with which the focal firm already has commercial transactions, but also the potential partners (contacts) that might be accessed in the future. Increasing the number of partners in the portfolio magnifies a firm's exchange opportunities. It heightens the probability that a new highly valuable exchange partner will emerge within the portfolio. Thus, if we assume that the value of any particular exchange is constantly changing in a changing environment, then as the number of potential exchange partners increases, the probability increases that the gains from cultivating stronger relationships with weak ties will outweigh the costs of severing existing strong ties. North (1990), for instance, contends that whenever markets expand and individuals specialize, innovations and new exchange opportunities constantly emerge. Consequently, the value of keeping existing long-term ties relative to alternative ties declines, prompting firms to transact less repeatedly. In the context of churning ties, managers will therefore intervene in the network more frequently, as the size of the portfolio increases.⁶ In other words:

Proposition 5: An increase in the number of partners in a portfolio of ties increases the frequency of managerial interventions within the portfolio.

Another factor influencing the frequency of managerial interventions in the portfolio is the *density of ties among partners*, i.e., the extent to which partners in the portfolio establish ties among themselves or beyond their ties with the focal firm which manages the portfolio. More ties among partners will imply more "closure" of the network (Coleman, 1988), which will bring two major consequences. First,

will have a business "contact" (Granovetter, 1973) which can be possibly accessed again in the future.

⁶ Discussing sources of network inertia in general, Kim, Oh and Swaminathan (2006) propose instead that an increase in network size should *decrease* network change due to the development of norms and institutionalized

information about firm behavior will more efficiently circulate among actors. Suppose, for instance, that the focal firm managing the portfolio severs a long-term tie to marginally benefit from an alternative partner offering a price that is only slightly lower than the price of the incumbent. In the absence of contacts among actual or potential partners in the portfolio, such action may remain undetected (except by the offended long-term partner). In contrast, if partners have extensive ties among themselves, then any action by the focal firm will rapidly be disseminated in the network and strongly affect its reputation (Kreps, 2004: 605-608), thereby magnifying the costs to intervene in the portfolio. Another consequence of closure is that, through the development of dense relationships, group-specific norms—including norms to support existing partners vis-à-vis outsiders (Jeffries and Reed, 2000; Portes and Sensenberger, 1993)—will tend to progressively emerge and reduce the willingness of firms to churn the network. Over time, closure will tend to impose constraints on managers' ability and propensity to restructure existing ties and access new ones (Jones et al., 1997; Uzzi, 1997). In other words, more closure will lead to more inertia in the portfolio (Kim et al., 2006):

Proposition 6: An increase in tie density among exchange partners decreases the frequency of managerial interventions within the portfolio of ties.

Firm-specific factors

One can consider firm-specific factors in two ways: focusing on the firm which is managing the portfolio of weak and strong ties to partners, or focusing on the partner firms directly. With respect to the focal firm which manages the portfolio of ties, a critical aspect that affects the dynamics of churning will be its competencies in forming and maintaining ties. Following previous research (Lambe et al., 2000), we use the term *relational competence* to describe a firm's ability to select valuable and trustworthy partners, manage its alliances, and curb its own incentives to defect, so that its partners perceive the firm as trustworthy. Thus, if firms exhibit relational competence, they are able to swiftly access new partners without resorting to costly formal mechanisms, such as joint ownership (Barney and Hansen, 1994).

features creating rigidity. Our theory argues the opposite: an increase in size greatly magnifies the set of opportunities available to firms and therefore creates benefits that will eventually surpass the costs of change.

Also, because they are perceived as trustworthy, firms with high relational competence are able to more successfully reorganize relationships rather than unilaterally terminate them when seeking new exchange partners. Overall, relational competencies will reduce the need for costly formal mechanisms to form and dissolve relationships; thus, the likelihood that firms will intervene in the network to explore and benefit from new exchange opportunities will increase.

It is likely that relational competencies are formed through cumulative experience with past alliances, as firms will learn how to select valuable partners and manage their interorganizational relationships in such a way to elicit cooperative actions (Anand and Khanna, 2000). Relational competencies may also be associated with the existence of dedicated units or teams within the firm's hierarchy to identify partners and manage a firm's ongoing alliances (Dyer et al., 2001). Therefore, although relational competencies are not directly observable, they may be positively associated with observable factors such as the firm's cumulative experience with the management of ties and the presence of dedicated organizational structures to screen, select and manage exchange partners. This leads to:

Proposition 7: An increase in the relational competence of the firm (indicated, for instance, by its experience in the management of alliance portfolios or by the presence of dedicated organizational units to manage relationships) increases the frequency of managerial interventions within the portfolio of ties.

Characteristics of the partners in the portfolio should also matter. As discussed earlier, the contingency of technological or demand uncertainty requires firms to periodically intervene in the network to tap external knowledge or, more generally, benefit from new exchange opportunities that are more valuable than existing long-term partners. If current partners, however, are able to adapt to changing environmental conditions, then managers will need to intervene less often. In particular, when partners display high *absorptive capacity* (Cohen and Levinthal, 1990), they will be able to effectively learn from external innovations and incorporate these into their own products or services. Partners' investments in research and development may generate this precise effect. By engaging in product improvements and active search for better opportunities, they are better able to cope with external

changes and maintain valuable partners as elements in a firm's portfolio of ties. For instance, Toyota stimulates several practices among suppliers (consulting groups, learning teams, etc.) to broadly develop and share knowledge (Dyer and Nobeoka, 2000; Sako, 2004). Because these practices help suppliers constantly remain on the cutting edge, managers intervene less often within the portfolio of ties to access new exchange opportunities. Therefore:

Proposition 8: An increase in the absorptive capacity of partners (indicated, for instance, by their involvement in research and development activities) decreases the frequency of managerial interventions within the portfolio of ties.

CONCLUSIONS

Given the increasing interest in models that describe how interorganizational ties contribute to firm performance (e.g. Dyer and Singh, 1998; Gulati et al., 2000), a careful analysis of the mechanisms through which firms can cope with the tradeoffs involved in the choice of tie strength is warranted. We offer a dynamic theory that explains how firms faced with this tradeoff adjust their ties over time to increase the performance of interorganizational relations. We argue that an inherent instability of interfirm ties will result from the need to periodically intervene in the network so as to flexibly access new exchange opportunities and, at the same time, create conditions for cooperation. Our theory therefore explains the oscillating patterns of tie strengthening and weakening often observed in empirical research (e.g. Capaldo, 2007; Eccles and Crane, 1988; Faulkner, 1983; Gadde and Mattsson, 1987). In our model, the periodic managerial interventions to change tie strength logically result from three assumptions usually found in the literature: that firms are often faced with conflicting demands that call for a portfolio of weak and strong ties; that ties within a portfolio are interdependent; and that there are costs to change ties (which implies that interventions will be intermittent instead of continuous).

Contributions to the literature on interorganizational collaboration

Besides proposing a theory that informs the dynamic management of a portfolio of ties, our study brings two other contributions to the literature. First, our theory clearly runs against the view that

relationship instability is dysfunctional. For instance, Dyer, Cho, and Wujin (1998: 73) assert that “vacillating between arm’s-length relationships and partnerships is unlikely to be a successful strategy given the long-term commitment and relation-specific investments required for strategic partnerships to be successful.” Given the assumption of conflicting contingencies and interdependence among ties, vacillation may indeed be a successful strategy (Nickerson and Zenger, 2002). Churning ties can deliver superior alliance performance by capturing temporarily the benefits of both weak and strong ties—a performance gain that would not possibly be attained with any static choice of tie strength. Very often, the manager’s job is not to statically develop a portfolio of weak and strong ties, but rather to dynamically manage tie strength across a portfolio of highly interdependent ties.

Second, our model potentially integrates two streams of research that have evolved rather independently: the analysis of tie *dissolution* (e.g. Dussauge et al., 2000; Kogut, 1989; Levinthal and Fichman, 1988) and the analysis of tie *formation* (e.g. Gulati, 1995b; Powell et al., 1996; Stuart, 1998). Our theory clearly shows that both analyses cannot be divorced, since the decision to reorganize or terminate a tie has consequences for the formation of subsequent ties, and vice versa (Podolny and Page, 1998: 70). Thus, the focus on isolated events of tie formation or dissolution provides only a partial picture of the dynamics and the management of interorganizational relations. Our model fills this void by discussing how different mechanisms to restructure or sever existing ties influence the formation of new ones, and how the mechanisms employed to build new relationships affect firms’ ability to change them when necessary.

Our theory also adds to punctuated equilibrium models in organization research. According to this literature, “organizations progress through *convergent* periods punctuated by *reorientations* which demark and set bearings or the next convergent period” (Tushman and Romanelli, 1985: 173). In our model, the periodic managerial interventions devised to change tie strength have downstream consequences to other ties, which will then call for further changes in strength. Given the positive costs to change tie strength, there will be a lag between successive managerial interventions. Our model is also akin to what Miles and Snow (1992) call a “dynamic network”: “numerous firms (or units of firms)

operating at each of the points along the value chain, ready to be pulled together for a given run and then disassembled to become part of another temporary alignment” (p. 67). In addition, our theory is consistent with dialectical models of interorganizational relations, which assert that contradictory forces are crucial to explain change (e.g. Das and Teng, 2000; Zeitz, 1980). However, by describing both the key sources of conflict and the managerial mechanisms to dynamically deal with a portfolio of ties, we provide a more detailed, microanalytic theory of interorganizational dynamics.

Limitations and possible extensions

An important limitation of our study is that we assume the existence of managers who monitor the performance of relationships and adopt changes to balance cooperation and flexibility to pursue new exchange opportunities. Although this allows us to focus on the main rationale of churning strategies, it ignores a real possibility: that managers themselves may be part of the social processes which alter the nature of ties over time, and thus may avoid any form of change. For instance, the termination of a relationship may be resisted by managers who “often staked their careers on the success of the alliance project,” even when the relationship proves to be unprofitable (Inkpen and Ross, 2001: 144). How then to justify the impetus to churn ties? The simplest way, commonplace in economics, is to assume that firms and their managers (through reputation concerns or incentives) face market pressures to make efficient decisions. A more refined justification comes from Beckert’s (1999) model of institutional change. Namely, as a portfolio of ties approaches stable, yet inferior patterns of functionality—i.e., strong, extended ties in a changing technological environment—it becomes increasingly salient that change could deliver performance gains. This triggers the emergence of individuals willing to “destroy established taken-for-granted rules if they perceive such action to be profitable” (Beckert, 1999: 786). Such individuals correspond to the managers in our theory. We admit, however, that intervention mechanisms are a black box in our model, and thus deserve further development in subsequent work.

Also, our unit of analysis is the ego network (portfolio of ties) of a particular firm and thus fails to consider other aspects that might influence network change. For instance, we ignore ties that partners will have with actors *outside* the portfolio. Buyers, for instance, have not only first-tier suppliers—which are

part of the buyer's portfolio, according to our conceptualization—but also second-tier suppliers which may bring new ideas and opportunities to the network (Uzzi, 1996). Also, a tie with a “prestigious” firm—a firm that has itself ties to several important actors in a given sector or economy (Podolny, 1993; Stuart, 1998)—may generate reputation-based benefits will go beyond the direct commercial value of the transaction. Our theory could be expanded by considering not only the strength and structure of ties among firms in the portfolio, but also the broader structural position of firms beyond the focal firms' ego network.

Furthermore, the benefits to adopt a weak or strong tie are likely to be influenced by the extent to which other firms in a given sector or economy employ weak or strong ties. Thus, when some firms adopt weak ties, the set of external opportunities available to other firms in the network increases, possibly reinforcing the trend toward weak ties (Kranton, 1996). The adoption of standardized mechanisms such as Internet procurement can be self-reinforcing for this reason: the benefits to use those mechanisms increase as the number of firms adopting the same standard increases (Lucking-Reiley and Spulber, 2001). Likewise, the adoption of either strong or weak ties can follow institutionalization processes (DiMaggio and Powell, 1983), because firms may follow practices considered as legitimate by shareholders, investors, and other agents. In the presence of those externalities, we may see industry-wide cycles of tie change induced by emergent interactions between multiple agents. Integrating endogenous, micro-level change occurring at ego networks with emergent, macro-level change at industry-wide networks will provide a major leap towards the understanding of how interorganizational relations evolve and influence firm performance.

REFERENCES

- Adler, P. S., and S.-W. Kwon. 2002. Social capital: prospects for a new concept. *Academy of Management Review* **27**:17-40.
- Afuah, A. 2000. How much do your co-opetitors' capabilities matter in the face of technological change? *Strategic Management Journal* **21**:387-404.
- Anand, B. N., and T. Khanna. 2000. Do firms learn to create value? The case of alliances. *Strategic Management Journal* **21**:295-315.
- Anderson, E., and B. Weitz. 1992. The use of pledges to build and sustain commitment in distribution channels. *Journal of Marketing Research* **29**:18-34.
- Asanuma, B. 1989. Manufacturer-supplier relationships in Japan and the concept of relation-specific skill. *Journal of the Japanese and International Economics* **3**:1-30.
- Axelrod, R. 1984. *The evolution of cooperation*. Basic Books, New York.
- Barney, J. B., and M. H. Hansen. 1994. Trustworthiness as a source of competitive advantage. *Strategic Management Journal* **15**:175-190.
- Barzel, Y. 1982. Measurement costs and the organization of markets. *Journal of Law and Economics* **25**:27-48.
- Beckert, J. 1999. Agency, entrepreneurs, and institutional change. The role of strategic choice and institutionalized practices in organizations. *Organization Studies* **20**:777-799.
- Blodgett, L. L. 1992. Factors in the instability of international joint ventures: an event history analysis. *Strategic Management Journal* **13**:475-481.
- Bottom, W. P., K. Gibson, S. E. Daniels, and J. K. Murnighan. 2002. When talk is not cheap: substantive penance and expressions of intent in rebuilding cooperation. *Organization Science* **13**:497-514.
- Capaldo, A. 2007. Network structure and innovation: the leveraging of a dual network as a distinctive capability. *Strategic Management Journal* **28**:585-608.
- Cohen, W. M., and D. A. Levinthal. 1990. Absorptive capacity: a new perspective on learning and innovation. *Administrative Science Quarterly* **35**:128-152.

- Coleman, J. S. 1988. Social capital in the creation of human capital. *American Journal of Sociology* **94**:95-120.
- Cook, K. S., and R. M. Emerson. 1978. Power, equity and commitment in exchange networks. *American Sociological Review* **43**:721-739.
- Crocker, K. J., and S. E. Masten. 1991. Pretia ex machina? Prices and process in long-term contracts. *Journal of Law & Economics* **34**:69-99.
- Das, T. K., and B.-S. Teng. 2000. Instabilities of strategic alliances: an internal tensions perspective. *Organization Science* **11**:77-101.
- DiMaggio, P., and W. W. Powell. 1983. The iron cage revisited: institutional isomorphism and collective rationality in organizational fields. *American Sociological Review* **48**:147-160.
- Doz, Y. L., and G. Hamel. 1998. *Alliance advantage: the art of creating value through partnering*. Harvard Business School Press, Boston.
- Dussauge, P., B. Garrette, and W. Mitchell. 2000. Learning from competing partners: outcomes and durations of scale and link alliances in Europe, North America and Asia. *Strategic Management Journal* **21**:99-126.
- Dyer, J. H., D. S. Cho, and C. Wujin. 1998. Strategic supplier segmentation: the next "best practice" in supply chain management. *California Management Review* **40**:57-77.
- Dyer, J. H., P. Kale, and H. Singh. 2001. How to make strategic alliances work. *Sloan Management Review* **42**:37-43.
- Dyer, J. H., and K. Nobeoka. 2000. Creating and managing a high-performance knowledge-sharing network: the Toyota case. *Strategic Management Journal* **21**:345-367.
- Dyer, J. H., and H. Singh. 1998. The relational view: cooperative strategy and sources of interorganizational competitive advantage. *Academy of Management Review* **23**:660-679.
- Eccles, R. G. 1981. The quasifirm in the construction industry. *Journal of Economic Behavior and Organization* **2**:335-357.

- Eccles, R. G., and D. B. Crane. 1988. *Doing deals: investment banks at work*. Harvard Business School Press, Boston.
- Faulkner, R. R. 1983. *Music on demand: composers and careers in the Hollywood film industry*. Transaction Books, New Brunswick.
- Gadde, L.-E., and L.-G. Mattsson. 1987. Stability and change in network relationships. *International Journal of Research in Marketing* **4**:29-41.
- Gargiulo, M., and M. Benassi. 2000. Trapped in your own net? Network cohesion, structural holes, and the adaptation of social capital. *Organization Science* **11**:183-196.
- Grabher, G. 1993. The weakness of strong ties: the lock-in of regional development in the Ruhr area. Pages 255-77 in *The embedded firm: on the socioeconomic of industrial networks* (G. Grabher, ed.) Routledge, London and New York.
- Granovetter, M. 1973. The strength of weak ties. *American Journal of Sociology* **78**:1360-1380.
- Granovetter, M. 1982. The strength of weak ties: a network theory revisited. Pages 105-130 in *Social structure and network analysis* (P. V. Marsden, and N. Lin, eds.). SAGE, Beverly Hills.
- Granovetter, M. 1985. Economic action and social structure: the problem of embeddedness. *American Journal of Sociology* **91**:481-510.
- Gulati, R. 1995a. Does familiarity breed trust? The implications of repeated ties for contractual choice in alliances. *Academy of Management Journal* **38**:85-112.
- Gulati, R. 1995b. Social structure and alliance formation pattern: a longitudinal analysis. *Administrative Science Quarterly* **40**:619-652.
- Gulati, R., N. Nohria, and A. Zaheer. 2000. Strategic networks. *Strategic Management Journal* **21**:203-215.
- Halpern, J. J. 1994. The effect of friendship on personal business transactions. *Journal of Conflict Resolution* **38**:647-664.
- Hansen, M. T. 1999. The search-transfer problem: the role of weak ties in sharing knowledge across organizational subunits. *Administrative Science Quarterly* **44**:82-111.

- Harrigan, K. R. 1988. Joint ventures and competitive strategy. *Strategic Management Journal* **9**:141-158.
- Heide, J. B., and A. S. Miner. 1992. The shadow of the future: effects of anticipated interaction and frequency of contact on buyer-seller cooperation. *Academy of Management Journal* **35**:265-291.
- Helper, S. 1991. Strategy and irreversibility in supplier relations: the case of the U.S. automobile industry. *Business History Review* **65**:781-824.
- Hite, J. M., and W. S. Hesterly. 2001. The evolution of firm networks: from emergence to early growth of the firm. *Strategic Management Journal* **22**:275-286.
- Holmstrom, B., and P. Milgrom. 1994. The firm as an incentive system. *American Economic Review* **84**:972-991.
- Holmstrom, B., and J. Roberts. 1998. The boundaries of the firm revisited. *Journal of Economic Perspectives* **12**:73-94.
- Inkpen, A. C., and J. Ross. 2001. Why do some strategic alliances persist beyond their useful life? *California Management Review* **44**:132-148.
- Jarillo, J. C. 1988. On strategic networks. *Strategic Management Journal* **9**:31-41.
- Jeffries, F. L., and R. Reed. 2000. Trust and adaptation in relational contracting. *Academy of Management Review* **25**:873-882.
- Jones, C., W. S. Hesterly, and S. P. Borgatti. 1997. A general theory of network governance: exchange conditions and social mechanisms. *Academy of Management Review* **22**:911-945.
- Jones, C., W. S. Hesterly, K. Fladmoe-Lindquist, and S. P. Borgatti. 1998. Professional service constellations: how strategies and capabilities influence collaborative stability and change. *Organization Science* **9**:396-410.
- Joskow, P. L. 1988. Price adjustment in long-term contracts: the case of coal. *Journal of Law & Economics* **31**:47-83.
- Kern, H. 1998. Lack of trust, surfeit of trust: some causes of the innovation crisis in German industry. Pages 203-213 in *Trust within and between organizations* (C. Lane, and R. Bachmann, eds.). Oxford University Press, Oxford.

- Kim, T.-Y., H. Oh, and A. Swaminathan. 2006. Framing interorganizational network change: a network inertia perspective. *Academy of Management Review* **31**:704-720.
- Kogut, B. 1989. The stability of joint ventures: reciprocity and competitive rivalry. *The Journal of Industrial Economics* **38**:183-198.
- Koka, B. R., R. Madhavan, and J. E. Prescott. 2006. The evolution of interfirm networks: environmental effects on patterns of network change. *Academy of Management Review* **31**:721-737.
- Kollock, P. 1994. The emergence of exchange structures: an experimental study of uncertainty, commitment, and trust. *American Journal of Sociology* **2**:313-345.
- Koza, M. P., and A. Y. Lewin. 1998. The co-evolution of strategic alliances. *Organization Science* **9**:255-264.
- Kranton, R. E. 1996. Reciprocal exchange: a self-sustaining system. *American Economic Review* **86**:830-851.
- Kranton, R. E., and D. F. Minehart. 2000. Networks versus vertical integration. *RAND Journal of Economics* **31**:570-601.
- Kreps, D. M. 2004. *Microeconomics for managers*. W. W. Norton & Company, New York.
- Lambe, C. J., R. Spekman, and S. D. Hunt. 2000. Interimistic relational exchange: conceptualization and propositional development. *Journal of the Academy of Marketing Science* **28**:212-225.
- Larson, A. 1992. Network dyads in entrepreneurial settings: a study of the governance of exchange relationships. *Administrative Science Quarterly* **37**:76-104.
- Levinthal, D. A., and M. Fichman. 1988. Dynamics of interorganizational attachments: auditor-client relationships. *Administrative Science Quarterly* **33**:345-369.
- Levinthal, D. A., and J. G. March. 1993. The myopia of learning. *Strategic Management Journal* **14**:95-112.
- Lucking-Reiley, D., and D. F. Spulber. 2001. Business-to-business electronic commerce. *Journal of Economic Perspectives* **15**:55-68.

- Macneil, I. R. 1980. Values in contract: internal and external. *Northwestern University Law Review* **78**:340-418.
- March, J. G. 1991. Exploration and exploitation in organizational learning. *Organization Science* **2**:71-87.
- McFadyen, M. A., and A. A. Cannella Jr. 2004. Social capital and knowledge creation: diminishing returns of the number and strength of exchange relationships. *Academy of Management Journal* **47**:735-746.
- Mesquita, L. F. 2007. Starting over when the bickering never ends: the role of trust facilitators in cluster development. *Academy of Management Review* **32**:72-91.
- Miles, R. E., and C. C. Snow. 1992. Causes of failure in network organizations. *California Management Review Summer*:53-72.
- Nickerson, J. A., and T. R. Zenger. 2002. Being efficiently fickle: a dynamic theory of organizational choice. *Organization Science* **13**:547-567.
- North, D. C. 1990. *Institutions, institutional change and economic performance*. Cambridge University Press, Cambridge.
- Pisano, G. P. 1989. Using equity participation to support exchange: evidence from the biotechnology industry. *Journal of Law, Economics, and Organization* **5**:108-126.
- Podolny, J. M. 1993. A status-based model of market competition. *American Journal of Sociology* **98**:829-872.
- Podolny, J. M., and K. L. Page. 1998. Network forms of organization. *Annual Review of Sociology* **24**:57-76.
- Poppo, L., and T. R. Zenger. 2002. Do formal contracts and relational governance function as substitutes or complements? *Strategic Management Journal* **23**:707-726.
- Portes, A., and J. Sensenberger. 1993. Embeddedness and immigration: notes on the social determinants of economic action. *American Journal of Sociology* **98**:1320-1350.

- Powell, W. W., K. W. Koput, and L. Smith-Doerr. 1996. Interorganizational collaboration and the locus of innovation: networks of learning in biotechnology. *Administrative Science Quarterly* **41**:116-145.
- Rauch, J. E., and J. Watson. 2003. Starting small in an unfamiliar environment. *Journal of Industrial Organization* **21**:1021-1043.
- Reuer, J. J., M. Zollo, and H. Singh. 2002. Post-formation dynamics in strategic alliances. *Strategic Management Journal* **23**:135-151.
- Richardson, G. B. 1972. The organization of industry. *The Economic Journal* **82**:883-896.
- Ring, P. S., and A. H. Van de Ven. 1994. Developmental processes of cooperative interorganizational relationships. *Academy of Management Review* **19**:90-118.
- Rowley, T., D. Behrens, and D. Krackhardt. 2000. Redundant governance structures: an analysis of structural and relational embeddedness in the steel and semiconductor industries. *Strategic Management Journal* **21**:369-386.
- Sako, M. 2004. Supplier development at Honda, Nissan and Toyota: comparative case studies of organizational capability enhancement. *Industrial and Corporate Change* **13**:281-308.
- Schilling, M. A., and H. K. Steensma. 2001. The use of modular organizational forms: an industry-level analysis. *Academy of Management Journal* **44**:1149-1168.
- Singh, K., and W. Mitchell. 1996. Precarious collaboration: business survival after partners shut down or form new partnerships. *Strategic Management Journal* **17**:99-115.
- Srinivasan, R., and T. H. Brush. 2006. Supplier performance in vertical alliances: the effects of self-enforcing agreements and enforceable contracts. *Organization Science* **17**:436-452.
- Stuart, T. E. 1998. Network positions and propensities to collaborate: an investigation of strategic alliance formation in a high-technology industry. *Administrative Science Quarterly* **43**:668-698.
- Tushman, M. L., and E. Romanelli. 1985. Organizational evolution: a metamorphosis model of convergence and reorientation. *Research in Organizational Behavior* **7**:171-222.

- Uzzi, B. 1996. The sources and consequences of embeddedness for the economic performance of organizations: the network effect. *American Sociological Review* **61**:674-698.
- Uzzi, B. 1997. Social structure and competition in interfirm networks: the paradox of embeddedness. *Administrative Science Quarterly* **42**:35-67.
- von Hippel, E. 1994. "Sticky information" and the locus of problem solving: implications for innovation. *Management Science* **40**:429-439.
- Weiss, A. M., and N. Kurland. 1997. Holding distribution channel relationships together: the role of transaction-specific assets and length of prior relationship. *Organization Science* **8**:612-623.
- Williamson, O. E. 1985. *The economic institutions of capitalism*. The Free Press, New York.
- Wise, R., and D. Morrison. 2000. Beyond the exchange: the future of B2B. *Harvard Business Review* **November-December**:86-96.
- Yamagishi, T., K. S. Cook, and M. Watabe. 1998. Uncertainty, trust, and commitment formation in the United States and Japan. *American Journal of Sociology* **104**:165-194.
- Young-Ybarra, C., and M. Wiersema. 1999. Strategic flexibility in information technology alliances: the influence of transaction cost economics and social exchange theory. *Organization Science* **10**:439-459.
- Zeitlitz, G. 1980. Interorganizational dialectics. *Administrative Science Quarterly* **25**:72-88.

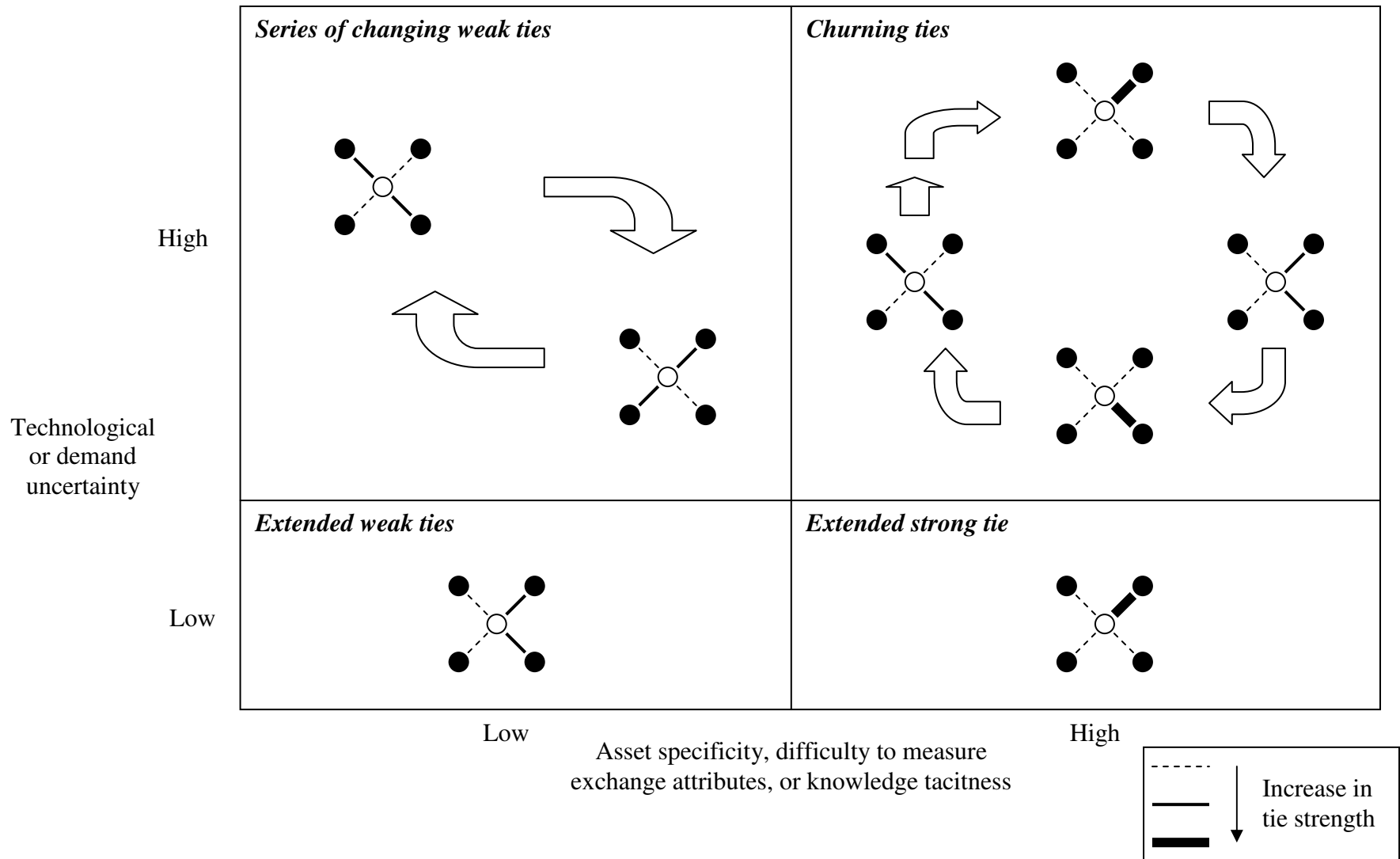


Figure 1

Representation of how contingencies may lead to different patterns of network dynamics