Coordination Costs and Coordination Mechanisms in Alliances: An Evolutionary View

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Abstract

The authors develop testable propositions in this paper that contradict existing theory by suggesting that coordination costs in alliances do not increase as a result of increased coordination and association between partner-firms. Rather, firms employ increasingly complex coordination mechanisms under repeated transactions with partner-firms to move (evolve) from purely formal coordination mechanisms to a more cost-efficient combination of formal and informal coordination mechanisms, which reduce marginal costs of coordination.

Introduction

At the crux of alliance transactions lie two interrelated concepts that explain cooperation among partner-firms--governance and coordination (Williamson 1975; Williamson 1985). While managerial governance choice is studied at a strategic level in alliance theory (e.g. Hagedoorn and Narula 1996), coordinating mechanisms are seen as acting at the operating level of an alliance (Argyris 1995; Cohendet, Kern et al. 1999). The essence of coordination lies in the nature of organizational routines (Nelson and Winter 1982), and their condition at the time of alliance formation; these determine the performance of operating or task-related activities. While the preconditions from which coordination starts between firms may initiate the alliance process, the evolving nature of operating mechanisms that form the basis upon which coordination between partnering firms occurs should be the focal point of theoretical views of coordination costs in alliances. Since coordination is an evolving phenomenon, the costs associated with it should be based on the dynamic nature of the mechanisms that are in place for coordination between firms to exist.

Insofar as the foregoing argument is true, extant literature on coordination costs suggest otherwise. For instance, Gulati and Singh (1998) posit that coordination costs are dependent on the level of interaction between firms. Lesser interaction leads to lower levels of coordination costs, which is supported by White (2002) who suggests that “it is more efficient in terms of coordination costs to limit the need for interaction between two or more units involved in a joint task because it reduces the costs associated with interorganizational coordination mechanisms” (p. 6). Although White’s assertion that “some benefits (e.g. learning and transfer of tacit knowledge) require greater interaction, so limiting interaction could have the effect of reducing efficiency even while reducing costs (emphasis added)” supports our point of view, consider that all forms of coordination evolve over time, suggesting we must consider evolutionary effects in the explication of coordination costs, regardless of the type of activity. A static perspective in explaining coordination costs not only obfuscates the conceptual underpinnings of how such costs develop, but also limits the study of coordination among partnering firms. By “static” we mean perspectives that have used preconditions to define coordination costs and views that have not considered the evolutionary nature of the mechanisms in place that actually impact coordination mechanisms in alliances. This is generally true while considering the impact of
information technology (IT) on coordination mechanisms and costs (Daft and Lengel 1986; Daft, Lengel et al. 1987). The literature on IT in alliances suggests that coordination costs can be lowered when firms consider more than one business partner even if this calls for more complex coordination mechanisms between partners (Bakos and Brynjolfsson, 1997).

This paper is an attempt to unpack the evolution of coordination costs in collaborations. We posit that given the level of development in IT and its impact on coordination costs, partner-firms will not deliberately limit the level of interaction between them. This in turn forms the basis for the deployment of more complex coordination mechanisms, which increases partners’ propensity for more interactions. Increased interaction creates the required experience-base, comfort-level and impetus for the development of trust among firms. The importance of trust and its impact on partner-firms has been noted in terms of governance mechanisms and costs (see Chathoth & Heiman 2003). We extend this notion to coordination costs in collaborative ventures by suggesting that coordination mechanisms develop during alliance inception and are refined via an evolutionary dynamic. Ideally, initial coordination mechanism endowments and evolutionary change action to which these mechanisms are subject, facilitate trust-based interfirm interaction, which creates greater interdependence between partner-firms. Increasingly complex, idiosyncratic, trust-based coordination mechanisms evolve so as to lead to an eventual decrease in marginal costs of coordination within a particular alliance, as well as for future same-partner alliances. We assert that firms evolve unique coordination mechanisms over time, via combinations of formal and informal coordination mechanisms.

Coordination Mechanisms and Costs

Collaborations are vehicles that firms use to come together in a joint effort to co-produce goods and services through the effective use of co-specialized assets (Dyer & Singh, 1998; Gulati & Singh, 1998). Coordination among partnering firms is the basis on which collaborations succeed. We define coordination along the lines of Gulati and Singh (1998)—as how partnering firms identify how interdependent activities will be carried out, activities which will lead to the accomplishment of objectives laid out at the inception of an alliance. Somewhat more formally, coordination can also be defined as “the alignment of action of agents who undertake different activities, minimizing the cost of division of labor” (Thomessen and Lorenzen, 2001; p 4).

Coordination among firms is a result of interdependence that is brought forth by ex-ante alliance negotiations and the subsequent alliance agreement. As noted above, the essence of coordination is in the alignment of actions of firms that encompass different activities.1 The alignment of actions is a result of identification of one’s Partners’ competencies that have potential value when applied interdependently. Furthermore, interdependence between partner-partners influences the way relationships evolve in an alliance. In this paper, we focus on interorganizational modes of coordination, which pertain to effective communication, information sharing, and development and utilization of co-specialized assets between partnering firms.

1 Note that coordination refers to alignment of activities that include (comparatively less-refined) information as well as knowledge (Foss, 2000).
Opportunism has been well documented in the literature on transaction cost economics; it potentially exists in every transaction involving two or more farsighted firms (Williamson, 1975, 1991). From a coordination costs perspective, opportunism forms the basis of how these costs come into being in the first place. Having examined others’ definitions and approaches to coordination costs, we define them as costs that result from choices regarding how collaborating firms need to work together to execute an interdependent activity. We emphasize that “working together” is the key to coordination costs. New collaborative ventures typically have more transaction costs associated with them because of opportunism that may exist at alliance outset. In the literature, this is also referred as vulnerability costs (e.g. Genefke, 2000), which are low if the concerns regarding opportunism are low. For a given alliance, these costs decrease over time as the alliance progresses, more so if partners take measures to reduce the potential for opportunism by building trust (see Chathoth & Heiman, 2003 in the context of governance costs). Indeed, if firms do not behave less opportunistically as the alliance moves forward, the lack of trust developed implies a costly or negative outcome of interdependent activities. Evolved trust is the basis of reduced transaction costs over time. This includes coordination costs, which are discussed in the following section.

Coordination Costs

Coordination costs result from interdependent activities among firms, which according to Genefke (2000) emanate from coordination problems which “grow if the activities performed across the border between collaborating organizations are complex and interdependent. Such operational interdependence is costly in terms of time, troubles, and money and therefore gives rise to coordination costs” (p.1). The “level of coordination costs is defined by the operational dependence between the activities performed by the partners” (Genefke, 2000; p. 2).

Gulati & Singh (1998) see coordination costs as those associated with activities among partners that range from decomposing tasks among members to the level of communication and decisions related to the joint accomplishment of set objectives. We adopt the same approach while defining coordination costs, in that these costs are incurred when there are ongoing problems of decomposing tasks and exchanging information among partnering firms.

Coordination costs emanate from transaction costs, which relate to “costs of achieving coordination and the costs of transaction specific risk resulting from the coordination” (Clemons and Row, 1992, p. 16). While costs of achieving coordination pertain to how firms will work with each other to create efficient coordination mechanisms, transaction specific risk relates to availability of transaction-specific capital, shirking, or loss of resource control (Kim, 2000). Bakos and Brynjolfsson (1997) suggest that coordination costs entail “costs of setting up a relationship, search costs, and transaction costs” (p. 3). The elements necessary for coordination to take place include “structure for communication and authority, task[s] for producing goods or services, actor[s] for performing task[s], and technology as a resource used in performing task[s]” (Kim, 2000; p. 276). In other words, these elements might be somewhat glibly summarized as task- and resource-related (Crowston, 1994). From an organizational standpoint, Kim (2001) states that “to accomplish the goal decomposed and assigned to each organizational unit, the coordination among actors within the unit with different roles is required in the interpersonal mode” (sic, p 337); also, “interacting with each partner entails a coordination cost”
Interdependence Defined

From an interorganizational alliance perspective that entails resource dependencies among two or more organizations, coordination costs are a function of how well these firms will manage specialization and differentiation. The anticipated interdependence between partners at the time of alliance formation is a function of what tasks will be shared and the nature of the division of labor associated with the sharing (Gulati & Singh, 1998). According to Gulati and Singh, interdependence between partners can range from simple interdependence to complex interdependence. In the case of simple interdependence, less sharing of resources results in partial adjustments between partners, whereas complex interdependence is a result of continued sharing of resources between partners with near-constant mutual adjustments. Therefore, the greater the task-sharing and complexity in resource-sharing alliance activities, the greater the interdependence between partner-firms. Further, the greater the division of labor in the joint accomplishment of tasks, the greater the interdependence.

Thompson (1967) developed the conceptual framework of interdependence, which entails pooled interdependence, sequential interdependence and reciprocal interdependence. Note that these concepts were defined to include interdependent activities that entail both tangible and intangible resources but from an activity-based perspective (i.e., cross-sectional, not longitudinal). Thomessen and Lorenzen (2001) argue that “coordination mechanisms are the institutionalized results of learning processes” (p. 7). They further point out that outcomes associated with the systems and processes that are either planned or developed are not given in advance per se, but they result from experimenting and adjusting mechanisms associated with coordination influenced by contingent factors. This brings forth the notion of the evolutionary process, which Nelson and Winter (1982), see as a result of the change of the state of the system because of factors that lie within and outside the system. Within the context of collaborations, contingency factors relate to the development of trust, which we see as part of the learning activity.

Trust, Information Technology and Coordination Mechanisms

Incentive alignment (Williamson, 1975, 1985) between partnering firms is a function of how each partner-firm accepts the alliance agreement, notably the joint objectives of an alliance, without causing appropriation concerns. Successful alignment is the basis upon which future, more complex transactions are initiated. Appropriation threats (potential opportunism) are gradually replaced by a degree of mutual trust (a result of the development of the alliance due to past successes and experience). We argue that trust evolves towards higher degrees after a series of successful future transactions between partnering firms (Das & Teng, 1998 define this as an increase in confidence levels).

We accept the definition of trust as an increase in confidence (Das & Teng, 1998) in a partner, which grows as an alliance progresses. Firms begin to consciously recognize that a partnering
firms will not act opportunistically when such opportunities arise because of the importance that it ascribes to the joint objectives of an alliance (Arino, de la Torre, and Ring, 2002). The recognition of each partner’s role in an alliance by other partners leads to alleviation of appropriation concerns, which are often prominent during the initial phase of an alliance. This explains why firms stipulate terms and conditions in the contractual agreement that address appropriation concerns. But since trust develops over a period of time (Gulati, 1995; Das & Teng, 1998, Chathoth & Heiman, 2003) and since it results when the alignment of firms’ actions go beyond what is stipulated in the contract, concerns for opportunism abate. Genefke (2000) points out that “it is the high degree of interaction in trust-situations that makes the relaxation of formal systems possible” (p. 5). Moreover, according to the Genefke, coordination becomes less costly as interaction develops between partnering firms because it takes (costly) time to develop interactions to a level necessary to facilitate meaningful, well-intentioned knowledge sharing. While the relationship between coordination costs and interaction is straightforward, the extant literature on costs of cooperation, which includes coordination, suggests the contrary. We discuss the evolution of coordination costs in the following section.

Information Technology

Partner-firms invest in technology with the objective of not only (1) being competitive, but also (2) becoming an attractive partner for alliance creation. Firms will invest in systems and processes that enable them to ally with firms that seek such alliances. According to Bakos and Brynjolfsson (1997), “as numerous authors have argued, IT does not appear to simply increase firms’ reliance on market coordination, but rather to have engendered new forms of organization such as “networks”, “virtual corporations” and “value adding partnerships”, which involve close links with relatively small number of business partners” (p.2). While it is documented in the literature that IT reduces coordination costs (Malone, Yates, and Benjamin, 1987), partner-firms may stipulate the IT capabilities in the preconditions to ally with other firms.

Coordination mechanisms entail “six kinds of dependencies among process, actor and object: process-process, process-object, process-actor, actor-object, actor-actor, and object-object” (Kim. 2000; p. 277). These dependencies are scrutinized by partner-firms during alliance formation, and to a large extent are created during the initial phase of an alliance. While most dependencies can be managed by stipulating terms and conditions during alliance formation, it is the actor-actor component which is exposed to more contingent factors, even if partner-firms use screening criteria for “cultural fit.” This is likely the reason why coordination costs can be mismanaged (poor or diminished performance) if firms do not achieve synergies in interpersonal dependencies. All dependencies, barring actor-actor dependencies, are expected to achieve synergies over a relatively shorter period of time (where needed), which may lead to coordination cost optimization. It is the actor-actor dependencies that could create appropriation concerns and cultural fit inconsistencies; the study of these interdependencies will help in understanding reduction of coordination costs from IT. We explore this from an evolutionary perspective in the following section.

The Evolution of Coordination Costs
Gulati & Singh (1998) posit that coordination costs will increase with partner interdependence (as coordination of tasks and decisions increases). They propose that firms that use good judgment and selection criteria in choosing partners identify partners that can be trusted to manage coordination costs effectively (in that these costs will be lower in such instances as compared to alliances where partners have less mutual trust and coordination). We posit, however, that more than selection criteria and the firm’s ability to choose a trustworthy partner, it is evolutionary forces (Nelson, 1995) that drive the coordination costs between partnering firms in an alliance.

From this perspective, it is no longer more important for firms to choose a trustworthy partner at alliance outset, which according to Williamson (1975) is difficult to achieve in the first place due to appropriation concerns as a result of opportunism; it would be more important for firms to achieve early alliance objectives during the initial phase of alliance formation in order to be able to take the collaboration positively forward. It is important for firms to be trustworthy and transparent in their behavioral intentions towards each other, even if the outcome of such an association is not certain (Zaltman and Moorman, 1988). Prior work done in alliance research focuses on governance and coordination costs using cross-sectional preconditions necessary for an alliance to be increasingly trust-based (Gulati & Singh, 1998), which we argue results only through repeated interactions (either within an alliance or from alliance to alliance) that foster social trust, which leads to the maturing of the relationship between partnering firms.

Successful ventures will create path dependent activities which will help firms to move from simple to complex interdependence in an alliance (assuming that there is scope to carry the alliance forward into more complex interdependent activities). The evolution of trust in a collaboration results from the very fact that partners would like to open up channels of communication and interaction (interdependence) with each other because of successful past transactions.

If past research in coordination costs are indicative of how firms manage dependencies, the interaction and interdependence between firms will be limited to the extent that coordination costs are optimized. This is contrary to our views of how trust evolves between organizations and how firms orient in a behavioral manner to achieve cultural fit. We posit that firms will increase interdependencies over time as they will be able to achieve lower costs of coordination when more complex dependencies are created. These dependencies arise from not only the process-process, process-object, process-actor, actor-object, and object-object perspectives, but also from the critical actor-actor perspective. We discuss this process below.

According to Thomassen and Lorenzen (2001), the essence of successful coordination lies in repeated transactions that are long-term oriented, in the absence of which costs associated with coordination would be higher. Moreover, from the standpoint of a dynamic system, the authors point out that in such situations, the costs of learning new or revised coordination mechanisms will be higher. Such effects occur only if firms that associate with each other have to gain from such an association. In other words, collaborating firms need to take specific measures towards incentive alignment, which in turn become the basis for the development of channels of communication (includes both formal and informal communication) and knowledge sharing.
According to Macneil (1980) and Thomas & Trevino (1993), communication and proactive information exchange can lead to the development of trust among partners. As a result, the uncertainty related to (1) the way in which activities will be decomposed and integrated between partners, and (2) the degree of coordination required by partners to mutually associate or integrate actions to achieve goals decreases. Note that the degree of interdependence at the time of alliance creation is restricted to the terms and conditions stipulated in the contract. This rapidly evolves towards greater or lesser levels depending on how the relationship matures between partnering firms.

Gulati and Singh (1998) view the role of trust and its influence on choice of governance structure from a static (cross-sectional) perspective while suggesting that less formal modes of governance will be chosen during the inception phase of the alliance. They fail to take into consideration that actual interdependence cannot be defined formally ex ante, rather it entails both formal (contractual) and informal (non-contractual) modes, which change as alliances mature. In a successful alliance, the informal nature of the relationship develops positively as an alliance progresses, which leads to the evolution of interdependence and trust. The assumption that preconditions determine the level of interdependence and that level of evolved trust would not impact the level of interdependence (based on selection criteria), represents a static view of conceptualizing alliances. In this paper, we argue that the marginal coordination costs associated with an evolving collaborative alliance network decrease as the network evolves from stringently-safeguarded to loosely (informally) safeguarded alliances as a result of increased interdependence and trust. We have also argued that the progression of these effects may be so strong as to be detectable within a given alliance. We see the empirical tractability of tracking evolution, however, from one alliance to others as greater, and so focus our primarily attention in that direction.

Some Propositions

The anticipated interdependence between partners at the time of alliance formation is a function of what tasks will be shared and what will be the division of labor associated with it (Gulati & Singh, 1998). Gulati & Singh posit that the coordination costs will increase with the anticipated level of interdependence in an alliance wherein there is greater need for ongoing task coordination and joint decision making between partnering firms. Although they posit that trust will be a factor in that it will decrease coordination costs, they do not explain the role of interdependence and trust in the evolution of coordination costs. We argue that as the alliance matures the degree of association between partners increases, which results in more interdependence. Since most partnering firms will cease to enter into highly interdependent relationships if the end result does not lead to favorable outcomes, the evolution of healthy relationships will be in the direction of increased coordination among partnering firms. This leads to Proposition 1:

Proposition P1: Increased association and interdependence leads to increased coordination among partnering firms.

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2 In this paper, we define an alliance network as comprising all alliances a specific firm has (over time) with a partner-firm or partner-firms, explicitly including past and present alliances.
As the degree of interdependence between alliance partners increases, the need to process more information increases (Galbraith, 1977; Gulati & Singh, 1998). Continued interdependence between partners in an alliance leads to more use of informal modes of communication and information processing (through social controls), and the marginal costs associated with coordination will decrease because partners in such alliances costly formal mechanisms are supplanted by informal means to process the requisite information. The use of IT in alliances will also help reduce coordination costs. This is contrary to Gulati & Singh’s hypothesis that higher interdependence leads to increased coordination costs as a result of firms’ need to foment interdependent activities. Research in IT suggests that coordination between business partners using information technology leads to lowering of coordination costs (Daft and Lengel 1986; Daft, Lengel et al. 1987). Note that trust cannot be viewed as a precondition because interdependence will help in the development of trust, unless partnering firms enter into an alliance agreement in which they stipulate the interdependence to be strictly formal. On the contrary, increased interdependence is a result of the evolution of the alliance network structure, which results in a more efficient governance mechanism as firms use both formal and informal control mechanisms. This leads to Proposition 2(a):

Proposition P2(a): Increased coordination among partnering firms will lead to an evolution of control mechanisms from formal modes to a combination of formal and informal control mechanisms.

Trust develops over time, often after all other task-resource interdependencies may actually have achieved synergies. Since firms that develop their trust-based relationship only after they achieve synergies in all other forms of dependencies in coordination mechanisms, the interpersonal dependencies will develop as firms will create an environment requiring more interaction and communication among partnering firms. Since the costs associated with increased association in an alliance network (because of social control) are less than the cost associated with a similar network with formal governance structure (Dyer & Singh, 1998; Das & Teng, 1998), the coordination costs associated with networks that rely on a combination of formal and informal control mechanisms are lower than that of alliances which rely solely on formal governance structures. This is because firms will use informal means of communication and modes of interdependence (intangible resource) along with tangible resources (IT) to achieve lower levels of coordination costs. This leads to Proposition 2(b):

Proposition P2(b): As control mechanisms evolve from formal to a combination of formal and informal modes, the marginal costs associated with coordination decrease.

The evolution of an alliance network progresses from formal to informal control mechanisms; the threshold after which firms move to using substantial informal control mechanisms is the point at which overall costs associated with governance would decrease. This is because the transaction costs (costs of an appropriate safeguard) in an alliance with formal control mechanisms exceed one with a combination of formal and informal control mechanisms (Chathoth & Heiman, 2003); less formal mechanisms eventually supplant some formal mechanisms. Also, coordination mechanisms are most effective when firms develop trust among themselves (Gulati and Singh, 1998), which gives rise to both formal and informal modes of information sharing, communication, and co-development of pooled resources. We posit that the
phase from which firms rely on both formal and informal modes of coordination mechanisms will be the threshold after which firms will enjoy lower coordination costs as compared to alliances which rely solely on formal coordination mechanisms. As alliances evolve from formal to a combination of formal and informal governance structures, the marginal costs associated with coordination will decrease gradually, leading to the relatively more specific (relative to P2) Proposition 3:

Proposition P3: In the case of repeated alliances, the marginal costs of coordination increase during the early stages of alliance formation, reach a maximum, after which they decrease.

Discussion and Directions

Caveats and Directions

One important direction for future study is, of course, to develop a supporting (or refuting) empirical effort. The authors are presently pursuing this goal. Also, a more detailed exploration of the precise evolutionary factors influencing the speed and direction of coordination mechanisms evolution is desirable (Nelson and Winter 1982). Though we have tried to distinguish coordination and governance costs, some confusion may remain, as they are indeed related concepts.

Discussion

There exists a dearth of research regarding the evolution of costs associated with alliances. Our paper complements Chathoth and Heiman’s (2004) effort to characterize the evolution of governance costs by offering some thoughts as to the evolution of coordination costs. Figure 1 illustrates our thinking in summary form. The need to specialize or differentiate from competitors drives firms to strive to execute increasingly complex tasks. Complex tasks involving idiosyncratic knowledge leads to the need for interaction with a partner-firm. Incurring coordination and transaction costs leads to a set of control mechanisms with particular initial capabilities endowments of alliances. Over time (either within a given alliance, but more importantly for our efforts, across same-partner alliances) routines evolve which involve increased interdependence. Though initially, formal control mechanisms are relied on to safeguard the performance of the activity, evolutionary forces drive partners to embrace less costly informal mechanisms. This ultimately results in decreasing marginal costs of coordination over alliances between the firm and its partner(s). Further, though beyond the scope of this work, the assertions offered in this paper fit well under umbrella of the nascent problem-solving perspective (Nickerson and Zenger, 2004), which emphasizes the problem as the unit of analysis (a highly compatible notion for evolutionary theory) and recognizes the value inherent in combining previously exclusive, antagonistic theoretical perspectives in a complementary manner.
FIGURE 1
A Framework for Coordination Mechanisms in Alliances

Need to Specialize/Differentiate

Incr. Task Complexity

Need for Interaction

Coordination Costs (alignment of differentiated activities)

Transaction Costs (costs of governance)

**CONTROL MECHANISMS**
- More routines, SOPs
- More specialization, interdependence, association
- Informal norms, trust

**EVOLUTIONARY/LEARNING THEORIES (Repeated Transactions) (P1)**
- More routines, SOPs
- More specialization, interdependence, association
- Informal norms, trust

**CONTROL MECHANISMS (P2)**
- Formal
- Informal
- Predicated outcomes (P2, P3)
- Less formal/more informal control
- Decrease in marginal costs of coordination
References


