WORKING THE PPP!
COORDINATION IN PUBLIC-PRIVATE PARTNERSHIPS

By

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To my wife Archana

and

my handsome boys Shaaranya and Saarthak
ACKNOWLEDGMENTS

The pursuit of a mid-career Ph.D. — especially when done as an international student — has its own nuances. It is no longer an individual academic pursuit, but instead an attempt made while standing on the shoulders of many others. One faces a multitude of challenges in this undertaking, which include thinking like a student (once again), adjusting to a new culture, taking care of a family, living on a student stipend, and -- and no small feat -- doing all of this simultaneously. Identifying everyone who has contributed to this journey would make it an unwieldy list; therefore, I am only attempting to acknowledge those few without whose efforts the completion of this dissertation would not have been possible.

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In this dissertation, I explore how work is carried out in public-private partnerships. Considering that such partnerships are between public and private agencies whose objective is to construct and operate public infrastructure, they emerge as a distinctive context, making the coordination of work potentially different from the coordination of work in firms and alliances. As such, I propose a model that focuses on how work is carried out through the use of coordination mechanisms by the use of context specific boundary objects and common ground. The antecedents to the use of these mechanisms, it is suggested, lie in the focus of the firm’s business and the experience profile of the coordinating managers.

In the context of the Indian highway industry, which has been utilizing PPPs extensively, the proposed theoretical model was tested on a unique sample of 42 highway projects being executed in the PPP mode. While the perceptions of the use of coordination mechanisms were collected by carrying out a primary survey of the
managers closely involved with these projects, data on firms and managers were collected from secondary sources.

The results suggest that, while a firm’s focus on the technical domain of highway construction is associated with the emphasis placed on the use of both boundary objects and common ground, these effects are amplified when the manager has PPP experience. Further, it is found that while the firm’s focus on PPP has no direct effects on the use of coordination mechanisms, if the manager tasked with the job of coordinating the project has a high firm tenure, the use common ground for coordination is deemphasized. The findings of the study – that a manager’s firm tenure significantly reduces the use of common ground for coordination when the manager’s firm tenure at a highly PPP focused firm is lengthy – are interesting in that they highlight the distinctiveness of PPP working. Also, the evidence provided by this study that managers’ experience profiles can significantly affect how coordination of work is carried out makes this an important first study in the literature studying coordination, highlighting that the quality of human capital (i.e., capabilities/experience specific to the highway industry, PPP form, and the firm) affect the management of alliances (i.e., coordination of work performed at the organization’s boundaries).
CHAPTER 1
INTRODUCTION

Organizations and Coordination

Organizations need to coordinate their work to achieve their fundamental purpose, making the study of coordination the prime focus of organization theorists (Daft & Lengel, 1986; March & Simon, 1958; Lawrence & Lorsch, 1967; Thompson, 1967; Van de Ven, Delbecq, & Koenig, 1976). Here, coordination of work refers to the “management of interdependence between activities” that organizations perform (Gittell, 2002; Malone & Crowston, 1994), and the coordination perspective refers to all of the different modes used to organize work in organizations: differentiation, centralization, formalization, and integration at the system level; along with routinization, discretion, significance determination, and feedback at the sub-system level (Sinha & Van de Ven, 2005). Accordingly, organizational studies focusing on coordination seek to study the source of interdependence between work activities, mechanisms deployed to manage interdependence, and the antecedents and consequences of these mechanisms.

The coordination perspective was central to early organizational studies and led to various different paradigms in organizational theory, such as the contingency theory, the configuration perspective, and the complexity perspective (Sinha & Van de Ven, 2005). However, both the gradual change in the nature of work over time (Barley & Kunda, 2001), and the fact that work is being done simultaneously between and within organizational boundaries (Sinha & Van de Ven, 2005), have over time combined to make it increasingly challenging to design, organize, and perform work efficiently and effectively.
Hence, there is a need to study and develop a more comprehensive coordination framework that focuses on these new ways in which work is performed.

**Plural Forms of Organizations**

Organizations and their different forms are ubiquitous in their presence (Scott, 1998). Moreover, recent times have witnessed the emergence of many plural forms of organizations as larger and larger amounts of work have been organized in some form of an alliance, either viewed as a swollen middle on the continuum of market and hierarchies (Hennart, 1988), or as a swell in the network of organizing work (Gomes-Casseres, 1996).

At the same time, organizational scholars also recognize that the government plays an important role in determining how organizations work (McEvily, Perrone, & Zaheer, 1999; Owen-Smith & Powell, 2004). However, the government has generally been seen as shaping the structure and composition of the organizational field, by creating institutions at different levels of the society and contextualizing the behavior of organizations (Campbell, 2004; McDermott, Corredoira, & Kruse, 2009; Ring, Bigley, D'Aunno, & Khanna, 2005; Thelen, 2004). Unique to recent developments is the emergence of public-private partnerships (henceforth referred to as PPP), which while being plural forms of organizations are an alliance not between private firms, but an alliance between the government and a private firm.

**Need to Study Working of the PPP Form**

Specifically acknowledging the emergence of the PPP form of organizations, a number of theorists have recognized the need for studies that examine how they work. For instance, Kale and Singh (2009), reviewing the strategic alliance
literature, viewed PPPs as a new class of alliances, and found that the current strategic alliance literature has little to say on successfully managing this class. They argued that the objective functions of the partners are different in these alliances, and the partners bring diverse skill sets and organizational cultures, creating very different challenges for the management of the organization. They also foresaw a rich alliance research agenda, which focuses on the study of this class of alliances. Similarly, McGahan, Mahoney, and Pitelis (2009) argued that while public and private interests are interdependent, management scholars restrict themselves to the study of private firms, while public policy scholars study only public agencies, such as governmental, multilateral, community, and non-profit organizations. The authors also identified that neither management scholars nor public policy scholars examine the organizations that emerge out of the interdependencies that exist between public agencies and for-profit agencies and scholars need to address this gap. These same authors also recognized that large differences exist between private and public interests, and that there is a need to develop new theories of public-private interactions, so that organizational and institutional configurations and strategies relevant to this context can be identified.

**Focus of the Dissertation**

In this dissertation, I propose to study coordination of work in a new form of organization: public-private partnerships (PPP). We have little understanding of this new form of work organization (Kale & Singh, 2009; Mahoney et al., 2009), which spans the boundaries of public agencies and private firms. PPPs are different from the for-profit strategic alliances studied in organizational theory,
both on account of the public nature of one of the actors, i.e., the government, and the public good nature of the alliance’s objective (Rangan, Samii, & Van Wassenhove, 2006; Rufin & Rivera-Santos, 2010). At the public-private interface, PPPs have emerged as an attractive option for the delivery of public infrastructure the world over, and is gradually taking over functions that have traditionally been performed by the government.

With this background, I seek to understand how PPPs work, borrowing insights from literature on coordination in organizations and in alliances. More specifically, the study answers the following research questions:

- **RQ1**: What are the antecedents to the use of different mechanisms of work coordination?
- **RQ2**: How do the managers’ characteristics affect the use of coordination mechanisms?
- **RQ3**: How do PPPs coordinate work? What coordination mechanisms do they use and why?

The study has been conducted in the context of the Indian highway construction industry, which has in the last decade increased its capacity for constructing and upgrading highways from 5 km of highway per day to 20 km of highway per day. That is, between 2009 and 2015, India proposes to upgrade 7000 km of highway each year (India Infrastructure Research, 2010). An investment of almost 69 billion USD in the development of the Indian highway sector is expected between 2007 and 2012, and a sizeable portion of this (i.e., 34%) will come from the private sector. And increasingly, the PPP mode of highway development has emerged as the dominant mode for private participation in the sector. Such PPP projects are of prime importance to fueling
the infrastructure-led growth of India; hence, these projects are approved and monitored for performance at the highest level. For example, all road projects costing more than $200 million are approved and monitored by the Cabinet Committee of India, whose chairman is the Prime Minister. As of September 1, 2010, about 250 national highway projects were in the construction phase, 126 of which are being undertaken through the PPP mode. A significant but lesser number of projects have also been taken up at the state level. The context of this study lies in the 126 national and 53 state highway construction projects being undertaken through the PPP mode.

**Structure of the Dissertation**

Chapter 2 carries out a review of relevant literature, which can potentially guide us in understanding how coordination is done in PPPs. Thus, the review summarizes the literature studying coordination in the alliance context, and also identifies the use of different coordination mechanisms in organizations. With this understanding, the gaps in the coordination literature are summarized. Chapter 3 develops the theoretical context of PPP working, and while discussing the unique aspects of PPP, identifies how PPP are accordingly structured and managed. The theory development is carried out in Chapter 4 and a theoretical model of PPP working is proposed. While providing an overview of the Indian highway construction industry, which forms the empirical context for this study, Chapter 5 elaborates on the measures and methods used in carrying out the empirical study. Chapter 6 reports the results of the empirical study, and also puts forward some preliminarily findings of an alternate way in which the theoretical model can be conceptualized. The primary results of the empirical study are discussed in
Chapter 7. Further, while elaborating on the theme of coordination, Chapter 7 also highlights the importance of identifying the aspects of work in which coordination is carried out, moving beyond the mechanisms and antecedents of coordination. It also discusses how special purpose vehicles used in PPPs distance the firm from project level working, and this distance significantly affects how work is performed in PPPs. The dissertation ends with Chapter 8, which highlights the managerial implications of the study, as well as its limitations and future directions. The appendix presents the questionnaire used to survey how PPP’s coordinate their work.
CHAPTER 2
LITERATURE REVIEW ON COORDINATION

In this dissertation I study the working of PPPs, viewing them as a plural form of an organizational arrangement between private firms and the government.¹ Organizational theorists are guided by what they know about the pure forms while studying plural organizational forms, as the study of work in the pure forms leads to a better understanding of how work is performed in the plural forms. For instance, while studying the different ways in which economic activity is organized, Williamson (1985) identified the two pure organizational forms as markets and firm-based hierarchies. Accordingly, organizational theorists saw alliances as an intermediate form of economic activity organizing, lying between markets and hierarchies, and sharing attributes with both (Hennart, 1988). Later, while examining the alliance form, Powell (1990) emphasized that alliances should be viewed as a distinctive pure form of organization: the network form. Following this paradigm, PPPs can be viewed as a plural form lying between networks (more specifically strategic alliances) and hierarchies, which implies that the study of PPP working should be guided by what we know about coordination of work in both alliance and organizational contexts.

The study of coordination is the prime concern for organizational theorists, as the coordination of work is the primary means by which organizations achieve their fundamental purpose (Lawrence and Lorsch, 1967; Thompson, 1967). Hence, an extensive body of literature exists in this field, and a number of

¹ The terms organization and firm are used differently from here on. While the term organization is used in a generic way, and refers to all possible arrangements wherein work is performed, the term firm specifically refers to a hierarchical arrangement in which work is performed.
reviews of the literature exist, the most recent conducted by Okhuysen and Bechky (2009). As I delved into this rich literature, it emerged that literature studying coordination in alliances highlights the importance of coordination, and seeks to identify the antecedents and consequences of the extent to which firms coordinate in their alliances. On the other hand, the literature studying coordination in organizations seeks to identify the different mechanisms that are used to bring about coordination.

With the focus of this study on PPPs, this review is guided by coordination literature in both the alliance and organizational contexts. However, the review is selective and emphasizes the different foci of these literatures. While reviewing the alliance literature, the focus is on how coordination is conceptualized and on the antecedents of coordination. On the other hand, organizational literature is reviewed with the objective of identifying the different mechanisms of coordination. The review will summarize the current state of the literature on the use of mechanisms of coordination, identifying their antecedents, and pinpointing the gaps therein.

**Coordination and Alliances**

Coordination has been defined as the “management of interdependence between activities” (Gittell, 2002; Malone & Crowston, 1994). Alliances witness higher levels of coordination challenges, as here firms interdependently perform and manage task activities (Child & Faulkner, 1998; de Rond & Bouchikhi, 2004; Harrigan, 1985). The coordination challenges that firms face while working in alliances are determined both by the *characteristics of the firms* performing the tasks (Lawrence & Lorsch, 1967), and also by *how* the task is interdependently
performed (Thompson, 1967). Thus, alliance scholars study the factors leading to coordination challenges and the extent to which firms coordinate work in alliances.

The empirical setting contextualizes how the degree of coordination in alliances is conceptualized. For example, White and Lui (2005) studied coordination in contractual alliances between architects and general contractors in the Hong Kong construction industry, and the context led them to conceptualize coordination in terms of the amount of time and effort that the partners spend together to coordinate work. On the other hand, Carson, Madhok, Varman, and John (2003), in their study of inter-firm R&D collaborations, conceptualized coordination as the relative distribution of work between the coordinating agencies in terms of dollar value, value added, hours worked, and amount of research and development work. In contrast, Gulati & Sytch (2007), while studying the long-term procurement relationships of US auto manufacturers, conceptualized coordination as the degree to which the partners coordinate in the ten joint actions that they perform together.

**Antecedents of Coordination in Alliances**

Alliance literature identifies the determinants of coordination challenges to lie in task characteristics, firm characteristics, ex-ante control, and alliance characteristics. This literature is reviewed to identify both the antecedents and

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2 This contextualization is not a concern here, as the extent of coordination is a one-dimensional construct. In the various ways that coordination has been conceptualized in alliance settings, it fully serves to capture the extent to which firms coordinate in the alliance.
the mechanisms by which these antecedents affect the extent to which firms coordinate in the alliance.

**Alliance task characteristics and coordination**

As the characteristics of the alliance task mold the interdependence of the firms, the task determines the degree to which coordination challenges arise and firms coordinate (Bensaou & Venkatraman, 1995; Gerwin, 2004; Sobrero & Schrader, 1998; Srikanth & Puranam, 2010). Task characteristics, conceptualized in terms of asset specificity, complexity, and interdependence, have been found to determine the degree to which firms coordinate.

When the asset specificity of the alliance task is high, the investments made by firms in the alliance lead to a hostage situation for the firm. Consequently, firms work towards protecting their alliance-specific investments, and alliances witness higher levels of coordination; empirical evidence supports this argument. In long-term purchase relationships, the asset specificity of the task is found to be positively associated with both the extent to which the purchaser and the supplier take joint-actions (Gulati & Sytch, 2007; Zaheer, McEvily, & Perrone, 1998), and the extent to which they make joint decisions (Subramani & Venkatraman, 2003). Similarly, in the context of long-term contractual alliances in the construction industry, the asset specificity of the task is found to be positively associated with the amount of time and effort spent by partners in coordinating the alliance (White & Lui, 2005).

A complex task is characterized with a higher level of task interdependence, and requires a higher amount of coordination for its accomplishment (Thompson, 1967; Tushman & Nadler, 1978). In a study of long-term purchase relationships,
Gulati and Sytch (2007) find that task interdependence increases the propensity of alliance firms to take joint actions. Also, White and Lui (2005) find the increase in the value of the task increases the time and effort firms spend on coordination, as higher value tasks are more complex, and complex tasks require more coordination. More recently, Srikanth & Puranam (2010) studied coordination in the context of outsourcing, with similar findings. They found that the use of coordination mechanisms, such as task modularity, the amount of ongoing communication, and the use of tacit coordination mechanisms reduce the negative impact of task interdependence on the performance of the outsourcing activity.

**Alliance firms’ characteristics and coordination**

Firms vary in their ability to coordinate the alliance task (Gerwin, 2004). In the context of software service providers, an increase in the firm’s ability to manage software deliveries leads to a higher level of joint-action by the partners (Schreiner, Kale, & Corsten, 2009).

The ability to coordinate the alliance task may not only come from a firm’s expertise in the task, but also from its ability to work with others. This ability to work with others comes from prior experience. Experience in managing alliances reduces the time and effort firms need to coordinate in alliance (White & Lui, 2005), and also lowers the costs that the firm incurs in coordinating subsequent alliances (Lorenzoni & Lipparini, 1999). Also, the capability of a firm in managing alliances has been found to improve both alliance and firm performance (Heimeriks & Duysters, 2007; Kale, Dyer, & Singh, 2002). The alliance capability
of a firm lies in the Alliance Function, the dedicated function that firms create for managing their alliances (Dyer, Kale, & Singh, 2001).

Besides the capability of individual firms in the alliance, the differences and complementarities between the coordinating firms also affect coordination (Harrigan, 1985). While firm-level differences in goals and procedures increase coordination challenges, and require partners to spend more time and effort in coordinating alliance activities (White & Lui, 2005), the firm-level complementarities increase the propensity of firms to take joint action (Schreiner, Kale, & Corsten, 2009). On the other hand, the lack of differences between firms in an alliance (i.e., sameness) leads to a reduction in coordination challenges (Harrigan, 1985). As similar firms in an alliance possess a common language, this enables communication between them, reducing coordination challenges (Heath & Staudenmayer, 2000; Simon, 1945). Also, similarities in alliance-forming firms enable them to bond with one another and take joint actions (Schreiner, Kale, & Corsten, 2009; Zaheer & Venkatraman, 1995). Specifically, in a survey of 250 managers of the software services industry, Schreiner, Kale, and Corsten (2009) found that the ability of a firm to bond with its partners leads to joint action by them. Similarly, Zaheer and Venkataraman (1995), in an empirical study of service relationships between insurance firms and their agents in the US property and casualty insurance industry, found reciprocal investments by firms to be highly correlated with joint actions taken by them. They argued in support of these effects, as reciprocal investment reflects the mutual commitment of the partners and enables economic bonding between the alliance firms.
Ex-ante control and coordination

Coordination has performance implications in alliance contexts (Gerwin, 2004; Schilke & Goerzen, 2010). Hence, in pursuit of superior performance, managers attempt to design alliances that promote coordination between partners (Vlaar, Van Den Bosch, & Volberda, 2007). Thus, the design of ex-ante controls, such as contracts and equity structures, is an important antecedent of coordination in alliances. For instance, in the context of long-term vertical purchase agreements, an increase in the completeness of the contract has been found to lead to an increase in the extent of coordination (Mesquita & Brush, 2008). Similarly, as in sequential alliances, coordination manifests as joint sense-making by the alliance partners; narrowly-scoped and very specific contracts have been found to limit joint sense-making by the partners, while broadly-scoped and less specific contracts have been found to encourage it (Faems, Janssens, Madhok, & Van Looy, 2008).

Other than contracts, the level of equity contributed by the firms in the alliance also serves as an ex-ante control, leads to a higher firm embeddedness, and enables both richer communication and closer working between the alliance partners. Accordingly, an increase in the level of equity invested by the firms in the alliance has been found to increase coordination between alliance firms, measured as the speed of knowledge transfer between the partners (Oxley & Wada, 2009).

Alliance duration and coordination

As working together in an alliance for an extended time increases the familiarity of the firms with each other’s practices, coordination challenges are
likely to decrease with an increase in alliance duration (Gerwin, 2004). However, there is weak empirical evidence to support this argument. Alliance duration has been found to be an insignificant predictor of coordination in terms of time and effort spent in coordinating (White & Lui, 2005), and a marginal predictor of coordination in terms of joint actions taken (Gulati & Sytch, 2007; Subramani & Venkatraman, 2003; Schreiner, Kale, & Corsten, 2009; Zaheer, McEvily, & Perrone, 1998).

While the previously reviewed studies highlight the importance of coordination in the alliance context, and identify the antecedents of coordination to lie in task, firm, and alliance characteristics, they have little to say about how coordination gets done (i.e., the mechanisms of coordination that firms use). While a recent study by Srikanth & Puranam (2010) examines the use of mechanisms of coordination in the context of business process off-shoring, it primarily considers how the negative performance of task interdependence is molded differently by the use of different coordination mechanisms, and does not explore the antecedents to the use of different coordination mechanisms.

The importance of studying how coordination is carried out in alliances becomes all the more important when we recognize that the seminal studies in organizational theory (i.e., Lawrence & Lorsch (1967), Thompson (1967), and Van de Ven, Delbecq, & Koenig (1976)), which have guided the study of coordination in both alliances and organizations, took great pains to identify and differentiate among the various coordination mechanisms that firms can use, and found that the firm’s choice of coordination mechanisms had performance
implications. A lack of studies focusing on how coordination is done in alliances is a significant gap in the alliance literature, one which this dissertation seeks to address this gap.

To be able to study how coordination is carried out in alliances, we need to be better informed about all the possible mechanisms of coordination that can be used. The organizational literature that has emerged in the last four decades has studied the different mechanisms of coordination; hence it can guide such a study. Accordingly, the organizational coordination literature is reviewed next, with a narrow focus on studies that seek to identify the different ways in which firms coordinate work.

**Coordination in Organizations**

The formal study of coordination began shortly after the appearance of railroads, and the emergence of large-scale manufacturing (Scott & Davis, 2007). However, early studies focused on the design of work to bring about coordination, as exemplified in the advocacy of Taylor’s scientific management (Chandler, 1962). The later studies conducted in the early twentieth century focused on the design of organizations to bring about coordination, and sought to study how the uncertainties rooted in task, technology, and environment could be addressed by designing and structuring organizations (Okhuysen & Bechky, 2009). The designability of work and organizations is the central assumption in both these streams of literature, and they emphasize that deliberate attempts are required in both planning and execution to coordinate the work activity. However, scholars contributing to this early stream of literature also recognized that coordination had an emergent dimension (Okhuysen & Bechky, 2009). For instance,
organizations formalize their work to different degrees (Lawrence & Lorsch, 1967), rely on mutual adjustments (Thompson, 1967), use lateral relations (Galbraith, 1973) and use ad-hoc mechanisms (Donaldson, 2001) to coordinate their work. As it is difficult for scholars to measure these informal and emergent dimensions, while the early research used them as catch-all categories, in the last two of decades organizational research has been using innovative methods to conceptualize and measure these dimensions (Okhuysen & Bechky, 2009).

However, recent studies of the emergent ways of coordination continue to be guided by the seminal studies by Lawrence and Lorsch (1967) and Thompson (1967). These authors were the first to recognize that coordination could be carried out in many different ways. Whereas Lawrence and Lorsch (1967) argued that coordination of work can be carried out by both hierarchies and integrating teams, Thompson (1967) identified three conceptually distinct ways by which coordination is achieved: structuring of work, planning, and mutual adjustment. While guided by these seminal studies, scholars have further identified many different ways of coordination: group, personal, and impersonal modes (Van de Ven, Delbecq, & Koenig, 1976), formal and informal modes (Fang & Zou, 2010; Gulati, Lawrence, & Puranam, 2005; Jansen, Tempelaar, Van Den Bosch, & Volberda, 2009; Martinez & Jarillo, 1989) or programmed and non-programmed modes (Argote, 1982). Table 2-1 lists the different coordination mechanisms that have been studied in this extensive literature.

The different ways in which the mechanisms of coordination have been examined creates a conceptual problem in our ability to aggregate their findings.
(Grandori, 1997a, b). For example, it is unclear whether the use of groups for coordination (Van de Ven, Delbecq, & Koenig, 1976) is an informal/formal mechanism of coordination or whether it is a programmed/non-programmed mechanism of coordination. One of the reasons for this conceptual problem is that the researcher’s choice of coordination mechanism to study is driven by the context of the empirical studies. For instance, Argote (1982) was studying the working of hospital emergency units under conditions of uncertainty, and hence chose to study the differences in the dominant ways that these units coordinated their work. Most relevant to the context studied, she chose to study the antecedents and consequences of programmed and non-programmed modes of work coordination. On the other hand, Van de Ven, Delbecq, and Koenig (1976) studied the antecedents and consequences of the group, personal, and impersonal mechanisms of coordination, as these modes of coordination were most relevant in the context of state employment security agencies, whose working they were studying. Further, Jansen, Tempelaar, Van Den Bosch, and Volberda (2009) identified coordination mechanisms like senior management team rewards, senior management team integration, and cross functional interfaces, as being most relevant to their context, given their examination of how structural differentiation in organizations related with organizational ambidexterity in a cross industry sample of firms. While such empirical studies are very valuable, we face difficulties in aggregating their findings.

Two recent studies make considerable headway in our ability to aggregate these findings. Srikanth & Puranam (2010) identify three distinct and generic
coordination strategies: (a) redesign of task and use of standardized procedures, (b) creation of reciprocal predictability through extensive opportunities for communication, and (c) reliance on common ground. Similarly, Okhuysen & Bechky (2009) identify different mechanism of coordination, but emphasize that these coordination mechanisms coordinate work by bringing about the integrating conditions of (a) accountability, (b) predictability, and (c) common understanding. Hence, while a consensus emerges among researchers on the underlying theoretical ways in which the different coordination mechanisms work – generic strategies or integrating conditions – there still exists a lack of consensus on how to categorize the different mechanisms of coordination. For instance, while Okhuysen & Bechky (2009) identify the coordination mechanisms as plans and rules, objects and representations, roles, routines, and proximity, Srikanth & Puranam (2010) identify these as modularity, ongoing communication, and the use of tacit coordination mechanisms. However, the recognition that coordination is differently achieved by mechanisms that (a) structure the work, (b) use purposively created boundary objects, and (c) rely on common ground is common to the ways in which they identify coordination mechanisms. In Table 2-1 this three-fold categorization has been used to categorize the different coordination mechanisms studied in the literature reviewed. The three distinct categories of mechanisms of coordination identified above are discussed next, along with the distinctive ways in which they bring about coordination.³

³ Coordination of work serves two distinct purposes (i.e., it structures and it mobilizes work elements (McEvily, Perrone, & Zaheer, 2003)). Structuring refers to development, maintenance, and modification of the system (McEvily, Perrone,
Coordination Mechanism – Structuring of Work

The important role of both the design of work and the design of organizations in bringing about coordination has long been recognized (Okhuysen & Bechky, 2009). Despite the change in the nature of work, blurring of organizational boundaries, and the emergence of plural forms of organizations, such structuring mechanisms continue to be of importance, and overtime, many new ways of structuring have also been identified. For instance, both work and organizations can be designed using modules (Baldwin & Clark, 2000; Sanchez & Mahoney, 1994), work output can be standardized (Barki & Pinsonneault, 2005; Glouberman & Mintzberg, 2001), and formal contracts can be used to coordinate work (Faems, Janssens, Madhok, & Van Looy, 2008; Reuer & Arino, 2007). With a focus on deliberate design, the coordination mechanisms emphasizing structuring are primarily ex-ante and formal in nature.

The structuring of the work task serves to reduce coordination challenges by reducing the interdependence in the agencies performing the task (Baldwin & Clark, 2000). It also enables coordination by putting in place an elaborate incentive alignment that not only specifies who has to do what (i.e., the roles and responsibilities of agencies involved), but also specifies the benefits and punishments coordinating agencies receive for fulfilling or not fulfilling their duties (Deshpande & Zaltman, 1992; Mom, Van den Bosch, & Volberda, 2010; Poppo & & Zaheer, 2003), such that structuring designs the coordination mechanism to facilitate the exercise of the appropriate coordination processes (Thompson, 1967: pg 64). On the other hand, mobilization refers to aggregating the working procedures for implementing the process of converting resources into finalized activities performed by interdependent actors (McEvily, Perrone, & Zaheer, 2003).
Zenger, 2002). Thus they bring about consensus between the coordinating agencies in regards to their expectations and responsibilities.

When firms come together to work, the structuring of the work and of the organization both refer to the formal contract that firms sign to form an alliance. It is the formal contract that brings about an alignment of incentives between the different alliance firms, distributes the work among the firms in the alliance, and defines the specific roles and responsibilities of the firms. Hence, the contract brings about consensus on expectations and responsibilities, laying the ground for firms to coordinate work. However, not only can the contracts be structured in many different ways, they also vary in their complexity levels and vary in the clauses they contain (Reuer & Arino, 2007). Contractual clauses can also be enforced to varying degrees (i.e., rigidly or flexibly (Faems, Janssens, Madhok & Van Looy, 2008)), affecting the coordination of work.

**Coordination Mechanism – Use of Purposively Created Boundary Objects**

While structuring refers to the use of ex-ante mechanisms of coordination, during the emergent phase when the work is repetitively performed, the coordinating agencies enact purposive objects to bring about coordination. These refer to the use of rules, procedures, databases, routines, and practices, all of which are specific and purposively enacted objects, existing at the interface where coordination is carried out. The use of a railway timetable to operate railroads in a coordinated fashion can be viewed as a classic example of the use of such a purposively created boundary object for coordination (Okhuysen & Bechky, 2009).
The use of purposive boundary objects serves to address the coordination challenges brought about due to the limited cognitive ability of individuals carrying out coordination (Gulati, Lawrence & Puranam, 2005; Simon, 1945). Use of such objects helps to mitigate cognitive challenges by providing access to knowledge, as well as, providing a viable mechanism for sharing knowledge, reducing uncertainty and storing knowledge (Becker, 2004), and at the same time bringing about agreements, predictability, and common understanding between the coordinating agencies (Okhuysen & Bechky, 2009).

In the alliance context, where the coordinating agencies are two distinct firms, it is the set of mutually agreed and adopted boundary objects, such as plans, schedules, performance targets, etc., which bring about coordination. The use on boundary objects in alliances varies, as not only does a large variety of objects that can be used exists, but the way in which they get adapted and adopted for use may also vary.

**Coordination Mechanism – Use of Common Ground**

While structuring is ex-ante and the use of boundary objects emergent, both are purposive and deliberate attempts by firms to bring about coordination. Along with these, the coordinating firms can also emphasize common ground between them and use tacit coordination mechanisms to bring about coordination (Srikanth & Puranam, 2010). Common ground refers to knowledge that is shared and is known to be shared (Clark 1996). It emphasizes the use of spontaneous mechanisms to carry out coordination.

An instantiation of common ground lies in the emphasis placed on trust to coordinate work (McEvily, Perrone, and Zaheer, 2003). Trust enables work to be
performed jointly, as it makes existing links thicker by adding additional layers. It also makes reciprocity possible even when temporary inequity exists in the exchange, and reduces instances of redundancy by establishing specialized roles (McEvily, Perrone, & Zaheer, 2003). Trust also guards against opportunistic behavior, reinforces identification, and enables commitment on the part of the coordinating partners (McEvily, Perrone, & Zaheer, 2003; Puranam & Vanneste, 2009).

In the alliance context, as two or more organizations come together for work, the manifestation and use of common ground is not spontaneous, on account of differences between the organizations. Common ground has to be recognized, created, and made use of in these contexts (Srikanth & Puranam, 2010).

**Determinants of Use of Coordination Mechanisms**

Guided by the seminal studies on coordination by Lawrence & Lorsch (1967) and Thompson (1967), organizational studies view coordination challenges as emerging primarily due to the interdependence in tasks performed jointly by two or more different agencies. Accordingly, the few coordination studies that seek to study how firms differentially use coordination mechanisms find their antecedents in task characteristics. For example, while studying coordination of work by a large employment security firm, Van De Ven, Delbecq, and Koenig (1976) found that the antecedents to the use of different coordination mechanisms lie in the degree of uncertainty, interdependence, and complexity of the work task. More specifically, it was found that the use of coordination mechanisms that emphasize mutual adjustments, like horizontal communication and group meetings, tends to get emphasized with an increase in task
uncertainty. This increased emphasis comes about in lieu of the use of more formal coordination mechanisms, like hierarchy and impersonal programming. Also, an increase in the size of the coordinating firm was found to increase the use of impersonal means of coordination, as firms address the increase in complexity or size with the use of formalized and programmed mechanisms. At the same time, an increase in task interdependence was found to increase the use of all the different mechanism of coordination. Around the same time, Argote (1982) studied coordination in hospital emergency units, but did not find any significant effects of task input uncertainty on the adoption of different coordination mechanisms (i.e., programmed or non-programmed).

**Existing State of Coordination Literature**

The above review highlights the difference in perspective with which the alliance and organizational literatures have been studying coordination. While early organizational studies (like Van De Ven, Delbecq, and Koenig (1976) and Argote (1982)) differentiated between the different mechanisms used for coordination, no such studies exist in the context of alliances. Alliance studies are narrowly focused on studying the extent to which firms coordinate in the alliance work. Further, while the study of coordination in organizational contexts seeks to identify why firms use different mechanisms to coordinate work, alliance studies examine the reasons behind the variance in the extent to which firms coordinate work in alliances.

While the study of the different mechanisms of coordination in the alliance context is a large gap in the alliance literature, even the study of different mechanisms of coordination in organizations is dated (i.e., the last such study...
was by Argote in 1982). In the last few decades the nature of work has changed considerably (Barley & Kunda, 2001; Sinha & Van de Van, 2005), hence our understanding of how firms and alliances coordinate their work is out of date (Okhuysen & Bechky, 2009).

While coordination refers to the interdependent working of two or more agencies, coordination is carried out at the interface where the agencies interact. Besides recognizing the importance of the degree of agency involvement at the interface (Gulati & Sytch, 2007; Tsai, 2002), it is important to recognize that the interface also molds and guides how coordination is done (Wren, 1967). However, the interface can be viewed from many different perspectives that differ in their focus on its structural, technical, and human elements (Wren, 1967).

Both the alliance and organizational literatures identify the antecedents of coordination in task and organizational characteristics. However, of late organizational scholars have observed that a more comprehensive understanding of the work context is only possible if one takes a more meso-approach and accounts for how managers mold organizational working (Howard-Grenville, 2005). From a coordination perspective, the manager provides the human interface at which coordination is carried out when firms work interdependently. The manager operationalizes the firm level variables that affect coordination at the micro-level.

In this dissertation, I study how the human interface, that is the manager, affects the coordination of work at the firm’s boundary. While it is well known that managers play an very important role in how work is carried out by molding and
guiding it (Mintzberg, 1984), only a few studies could be identified that sought to study the role of managers in managing alliances. While these studies take the managerial practice view, are prescriptive in nature, and lack theoretical or empirical grounding, they are next reviewed to summarize what we know on the subject.

**Human Interface and Coordination**

The alliance manager is the human interface at which coordination of work gets done. While managing the interdependence of the task, the alliance manager lies outside firm boundaries, making his actions and behaviors less constrained by the parent firm in comparison to managers who are located within the firm’s boundaries (Child & Faulkner, 1998). The actions of alliance managers leave lasting effects on the alliance, very similar to how entrepreneurs and early firm managers leave an imprinting effect on the firm’s working, as they can establish traditions and ideologies without facing competing views (Stinchcombe, 1965). The significant effect of these managers on alliance working makes it important to identify the antecedents of their actions and behavioral choices.

While they are located outside their parent firm’s boundaries, alliance managers can also be seen as being located between firms. This makes the alliance manager a linchpin in the alliance management process (Spekman, Isabella, MacAvoy, & Forbes, 1996). The manager is responsible to the alliance that justifies his/her existence, is required to fulfill roles and responsibilities across multiple dimensions, and must shoulder an extra set of responsibilities beyond those of an organizational manager (Child & Faulkner, 1998). Thus, the alliance manager is required to play the role of a mediator, advocate, strategic
sponsor, and networker, while also playing the conventional roles of a visionary, manager, and facilitator required of an organizational manager (Spekman, Isabella, MacAvoy, & Forbes, 1996).

To fulfill this extra set of roles and responsibilities, the alliance manager requires a unique set of competencies that lie in different domains, and these are (a) functional competencies: education, experience, and domain knowledge; (b) earned competencies: credibility and respect, along with extensive networks; and (c) interpersonal competencies: social skills, communication skills, process and cross-cultural skills and competencies, and tact (Spekman, Isabella, & MacAvoy, 2000). At a more conceptual level, these competencies constitute the alliance mindset, which is comprised of various abilities, including, an ability to think in terms of patterns, connections and relationships; to never stop learning from experience; an ability to think about the world differently; to consider multiple points of view simultaneously, and an affinity for complexity (Spekman, Isabella & MacAvoy, 2000). Besides experience in multicultural and technical domains, looking beyond competencies, Child and Faulkner (1998) have identified a set of personality traits that an alliance manager needs to possess (i.e., open-mindedness, flexibility, self-confidence, sensitivity to others, and a drive to achieve).

While a few of the identified qualities of the alliance managers are physiological traits with which managers are born, managers can earn many of them, like education, experience, domain knowledge, social networks, credibility, communication and social skills. This makes the study of how managers’ earned
competencies affect coordination important from the managerial intervention perspective, as firms can select alliance managers depending upon the coordination needs of the alliance. Further, managers can also be trained and the relevant important competencies nurtured, enabling them to function as able alliance managers.

No empirical studies exist examining the effects of alliance manager’s qualities on alliance work (MacAvoy, Robert, Theodore, Lynn, & Thomas, 1998). The few relevant studies summarized above emphasize the importance of the role played by the alliance manager, but are primarily prescriptive, and while they contribute in building a managerial practice view, they do not contribute to the theory of work coordination. This study attempts to address this gap in the literature by providing an empirical study linking the alliance manager, as the human interface of coordination, with the extent of use of different mechanisms of coordination, in the alliance way of organizing work.
Table 2-1. Coordination mechanisms discussed in the literature.

<table>
<thead>
<tr>
<th>Labels used</th>
<th>Definition or usage in the studies</th>
<th>Citations</th>
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<tbody>
<tr>
<td>Coordination by structuring</td>
<td></td>
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<tr>
<td>Standardizing work and its output</td>
<td>Standardization of the work tasks, both the steps and the output</td>
<td>Barki &amp; Pinsonneault, 2005; Glouberman &amp; Mintzberg, 2001; Malone &amp; Crowston, 1994; Martinez &amp; Jarillo, 1989</td>
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<tr>
<td>Modularization of task</td>
<td>Division of task into manageable modules.</td>
<td>Baldwin &amp; Clark (2000)</td>
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<tr>
<td>Standardization of roles and responsibilities of managers</td>
<td>Structuring of the organizational framework</td>
<td>Deshpande &amp; Zaltman, 1982; Mom, Van den Bosch &amp; Volberda, 2010; Poppo &amp; Zenger, 2002</td>
</tr>
<tr>
<td>Departmentalization</td>
<td>Confinement of task elements to predetermined domains (departments), such that the members of departments are isolated from interdepartmental interactions</td>
<td>Fang &amp; Zou, 2009; Mintzberg, 1979; Thompson, 1967</td>
</tr>
<tr>
<td>Formal Hierarchy / Authority Vertical Channel Authority</td>
<td>Segregation of the organization into distinct organizational levels, where vertical chain of commands are used to work</td>
<td>Van De Ven, Delbecq &amp; Koenig, 1976; Argote, 1982; Sherman &amp; Keller, 2010; Gulati, Lawrence &amp; Puranam, 2005; Litterer, 1965; Thompson, 1967; Barnard, 1938</td>
</tr>
<tr>
<td>Formal Hierarchical (Centralization) Top Management Matrix Organization</td>
<td>A particular structural arrangement in which the two forms (departmentalization and hierarchy) operate with balanced priority and authority on a relatively permanent basis</td>
<td>Burns, 1989; Sherman &amp; Keller, 2010</td>
</tr>
<tr>
<td>Liaison Cross-functional interfaces Boundary Spanners / Integration Manager/ Care Coordinators</td>
<td>A structural unit that interfaces between distinct organizational subsystems</td>
<td>Jansen, Tempelaar, Van den Bosch &amp; Volberda, 2009; Sherman &amp; Keller, 2010; Thompson, 1967; Ito &amp; Peterson, 1986; Daft &amp; Lengel, 1986; Gittell, 2002; Van De Ven, Delbecq &amp; Koenig, 1976</td>
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Table 2-1. Continued

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<th>Labels used</th>
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<tr>
<td>Coordination by structuring</td>
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<tr>
<td>Teams (Temporary or semi-permanent)</td>
<td>A structural configuration in which individuals (from different levels in hierarchies and departments) are grouped together for achieving a specific purpose</td>
<td>Martinez &amp; Jarillo, 1989; Lawrence &amp; Lorsch, 1967; Sherman &amp; Keller, 2010; Thompson, 1967</td>
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<tr>
<td>Integrating teams / Cross unit teams</td>
<td></td>
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<tr>
<td>Degree of Formalized Structure, Participation</td>
<td>Emergent structure in terms of span of supervisory control and number of levels</td>
<td>Lawrence &amp; Lorsch, 1967</td>
</tr>
<tr>
<td>Centralization of Decision Making</td>
<td>The practice view on how hierarchy manifests itself</td>
<td>Aiken &amp; Hage, 1968; Martinez &amp; Jarillo, 1989; Mom, Van den Bosch &amp; Volberda, 2010; Ito &amp; Peterson, 1986</td>
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<td>Discretion, Unit Member Autonomy</td>
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<td>Coordination by use of boundary objects</td>
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<tr>
<td>Rules &amp; regulations</td>
<td>Use of rules for monitoring and controlling the tasks</td>
<td>Daft &amp; Lengel, 1986; Van De Ven, Delbecq &amp; Koenig, 1976; Argote, 1982; Schreiner, Kale &amp; Corsten, 2009</td>
</tr>
<tr>
<td>Planning</td>
<td>Establishment of objects (plans and schedules) that monitor and control the activities of the different units</td>
<td>Barki &amp; Pinsonneault, 2005; Daft &amp; Lengel, 1986; Martinez &amp; Jarillo, 1989</td>
</tr>
<tr>
<td>Monitoring Feedback</td>
<td>Review of performance and monitoring of how the procedures and rules are followed</td>
<td>Van De Ven &amp; Walker, 1984; Reuer, Zollo &amp; Singh, 2002; Gulati, Lawrence &amp; Puranam, 2005</td>
</tr>
<tr>
<td>Clinical pathway routines</td>
<td>Use of specific objects (routines) to guide the decision making while carrying out work</td>
<td>Gittell, 2002</td>
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<tr>
<td>Labels used</td>
<td>Definition or usage in the studies</td>
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<tr>
<td>Operating Procedures; Program Decisions; Plans; Programming</td>
<td>Use of specific objects (procedures, plans) that guides the decision making while carrying out work</td>
<td>Van De Ven, Delbecq &amp; Koenig, 1976; Gulati, Lawrence &amp; Puranam, 2005; Thompson, 1967; Sherman &amp; Keller, 2010</td>
</tr>
<tr>
<td>Shared databases</td>
<td>Use of specific objects (databases) that enable sharing of information between the participants</td>
<td>Sherman &amp; Keller, 2010</td>
</tr>
<tr>
<td>Common Technical Grammar, Common database</td>
<td>Common reference database or information exchange language</td>
<td>Argyres, 1999</td>
</tr>
<tr>
<td>Administrative and Control Systems</td>
<td>Use of specific objects (administrative and control systems) that enable monitoring and control</td>
<td>Litterer, 1965</td>
</tr>
<tr>
<td>Centralized Communication (Mediated by supervisor)</td>
<td>Nomination of a central object (supervisor) to mediate and monitor the exchange of all information</td>
<td>Tushman, 1979</td>
</tr>
<tr>
<td>Formal Information Systems</td>
<td>Use of specific objects (information systems) that enable sharing and exchange of information</td>
<td>Daft &amp; Lengel, 1986</td>
</tr>
<tr>
<td>Impersonal Direct Contact: Electronic/ Paper reports Display, Representation and Assembly practice</td>
<td>Use of Information exchange protocols.</td>
<td>Sherman &amp; Keller, 2010</td>
</tr>
<tr>
<td></td>
<td>Specific practices and routines that enable exchange of knowledge</td>
<td>Kellogg, Orlikowski &amp; Yates, 2006</td>
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<tr>
<td>Coordination by use of common ground</td>
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<tr>
<td>Relational Coordination</td>
<td>Shared goals, shared Knowledge and mutual respect, such that frequent, timely, accurate and problem solving communication can take place</td>
<td>Gittell, 2002</td>
</tr>
<tr>
<td>Communication, Peer to peer</td>
<td>Communication between directly concerned individuals, without regard to the established channels. Both comes about on account of common ground, and further leads to generation of common ground</td>
<td>Malone &amp; Crowston, 1994; Martinez &amp; Jarillo 1989; March &amp; Simon, 1958; Tushman, 1978; 1979; Aiken &amp; Hage, 1968; Keller, 1994; Van De Ven &amp; Walker, 1984; Tushman, 1979; Sherman &amp; Keller, 2010; Daft &amp; Lengel, 1986; Litterer, 1965</td>
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<td>Email/ Individual meetings</td>
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<tr>
<td>Voluntary Activities</td>
<td>An individual’s actions coming out of autonomous concerns</td>
<td>Tsai, 2002</td>
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<tr>
<td>Informal Lateral Relations</td>
<td>Establishment of common values, beliefs and expectations</td>
<td>Barki &amp; Pinsonneault, 2005; Glouberman &amp; Mintzberg, 2001</td>
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<td>Standardizing Norms</td>
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<tr>
<td>Connectedness</td>
<td>Degree to which employees are networked with one another at various levels of hierarchy in their organization in terms of personal contacts</td>
<td>Jansen, Tempelaar, van den Bosch &amp; Volberda, 2009; Mom, Van den Bosch &amp; Volberda, 2010</td>
</tr>
<tr>
<td>Network closure, Lack of structural holes</td>
<td>A network structural configuration such that members get connected together through multiple pathways, enabling trust to manifest</td>
<td>Gulati, 1995</td>
</tr>
<tr>
<td>Labels used</td>
<td>Definition or usage in the studies</td>
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<tr>
<td><strong>Coordination by use of common ground</strong></td>
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<tr>
<td>Standardizing skills and knowledge</td>
<td>Bringing in commonality between acting partners to reduced chances of conflict between them</td>
<td>Barki &amp; Pinsonneault, 2005; Glouberman &amp; Mintzberg, 2001</td>
</tr>
<tr>
<td>Shared Characteristics, Shared Experiences, Norms, precedent, culture</td>
<td>The emergence of commonness among the parties</td>
<td>Malone &amp; Crowston, 1994; Gulati, Lawrence &amp; Puranam, 2005</td>
</tr>
<tr>
<td>Mutual Adjustment Adaptation</td>
<td>People or units adjusting to each other during their work processes, as a way to accommodate the other</td>
<td>Barki &amp; Pinsonneault, 2005; Glouberman &amp; Mintzberg, 2001; Gulati, Lawrence &amp; Puranam, 2005; Thompson, 1967; Argote, 1982</td>
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CHAPTER 3
LITERATURE ON PPPS

In this dissertation I study coordination in the context of PPPs. While PPPs are popular, have achieved an iconic status, have a long history, and have been studied in a diverse literature, they are a unique context in which work is conducted (Hodge, Greve, & Boardman, 2011; Kale & Singh, 2009). To explore the distinctive aspects of the unique PPP context, this chapter briefly reviews the diverse literature studying PPPs, identifies the aspects which make PPP working distinctive, and describes the generic process of PPP formation and its structuring in the specific context of Indian highway construction.

**Review of Literature on PPPs**

PPPs are increasingly being used to carry out activities that were previously conducted purely in the public domain (Delmon, 2010). They enable the government to access precious financial, managerial, and technical resources, the availability of which restricts the government’s growth ambitions. They also provide the private enterprise an opportunity to contribute financially, technically, and managerially to a domain where it can work more efficiently and effectively (Hart, 2003; Rangan, Samii, & Van Wassenhove, 2006). These distinct and attractive features of PPPs have motivated governments across the globe to deploy them in the delivery of public infrastructures (Delmon, 2010). Consequently, PPPs have emerged as the preferred mode for developing infrastructures, such as roads, airports, railroads, and seaports, and even to run schools, hospitals, and water supply systems (Delmon, 2010), which have traditionally been the sole bastion of the government.
The pervasive use of PPPs can be gauged by the fact that in the past 15 years, Europe has witnessed over 1000 PPP contracts involving investments of almost 200 billion Euros (Frederic, Goldsmith & Valila, 2007), and 57% of all project expenditures in UK were made through the PPP mode over the seven year period of 2001-2008 (IFSL Research, 2008). Concurrent with this growth in the use of PPPs has been an increase in academic, managerial, and research interest in PPPs. Scholars in economics, finance, public policy, construction management, and public administration disciplines have started to study PPPs, providing valuable perspectives on PPPs (Henisz & Levitt, 2009; Hodge & Greve, 2010). As this literature is vast and fragmented (Hodge & Greve, 2007) a complete review is impossible. The objective of the overview provided here is to identify the foci of the different streams of literature, and ascertain how they contribute to the study of PPP working.

**Overview of Literature on PPP**

The different disciplines have differing focus when they study PPPs. For instance, economic scholars view PPPs as changing the boundary between public and private ownership (Hart, 2003; Shleifer, 1998). Hence, they see the use of PPPs as a viable option in the case of market failure and as an alternative to total privatization (Savas, 2000). With this view, the economics literature studies the rationale behind the emergence of PPPs (Shleifer, 1998; Mahalingam, 2010); the features of the regulatory environment that enables or prevents the emergence of PPPs (Davidsson, 2010; Koppenjan & Enserink, 2009); the basis for risk sharing between the private and public partners (for e.g., Marques & Berg, 2010, 2011, forthcoming; Thomas, Kalidindi & Anantharayanan, 2003; Choi,
Chung, & Lee, 2010); the scope of work and ownership distribution in PPPs (Chen & Chiu, 2010); and the contract formulation and renegotiation aspects of PPP design (for e.g., Martimort & Pouyet, 2008; Guasch, Laffont & Straub, 2007; 2008).

In contrast, the finance literature focuses on how private finances are deployed for the delivery of public infrastructure. More specifically, this literature examines the important role played by money markets in financing PPPs under the dynamic conditions of the changing money markets and the changing perceptions of risks that lie at the project, industry, and national levels (Heald & Georgiou, 2011).

While studying the changing role of the government, political scientists are beginning to recognize the plural forms of organizations that exist beyond the market and government dichotomy. Accordingly, polycentric organization has been recognized as an effective mode of organization in the public domain. In polycentric organizations, organizations work towards a common purpose while tightly integrated with one another, but follow their own narrow objectives (Ostrom, Tiebout, and Warren, 1961). PPPs are one such instantiation of a polycentric organization. Here, the government and the private firm work to achieve their own objective functions, while fulfilling a common objective purpose of delivering a public infrastructure. There is also an increasing recognition in this literature that the assumptions about a rational manager need to be relaxed to accommodate the important role that trust and learning play in the management of organizations in the public domain (Ostrom, 2009).
Organizational Literature on PPP and the Gaps Therein

From the organizational perspective, PPPs are a kind of an alliance (Kale & Singh, 2009; Rangan, Samii, & Van Wassenhove, 2006; Rufin & Rivera-Santos, 2010). While there is an extensive amount of research studying the structure, design, and working of alliances, this research is limited to the study of alliances between for-profit organizations (i.e., B2B alliances) (Mahoney, McGahan, & Pitelis, 2009), and only a few studies have attempted to study PPPs in which the government is a partner. However, these few existing studies also lie in the economics paradigm, as they explore the antecedents that lead to the formation of PPPs and how they are structured. For instance, combining transaction cost economics with externalities theory, Rangan, Swamii, & Van Wassenhove (2006) proposed a set of conditions under which PPPs emerge for the exploitation of economic opportunity. These conditions were identified as: existence of industry-specific competencies simultaneously with significant positive externalities, presence of high uncertainty for the private actors, and presence of high governance costs for the private actors in terms of contracting, coordinating, and enforcing. Similarly, McDermott, Corredoira, & Kruse (2009) took an institutional perspective, and studied how government support institutions created out of PPPs serve as a catalyst in upgrading emerging markets.

Focusing on the governance of PPPs, Rufin & Rivera-Santos (2010) compare PPPs with B2B alliances along five distinct dimensions of governance: use of equity, use of contract, scope of the work, nonequity hostage situations, and use of trust (Rufin & Rivera-Santos, 2010). Examining a case each of a PPP and a B2B alliance, they found that significant differences exist between them
along each of the five dimensions identified above. More recently, Kivleniece & Quélin (forthcoming) identify two ideal kinds of public-private ties governance (i.e., autonomous and integrative). Taking the private actor’s perspective they argue that, while on one hand the choice of the governance form is determined by the partnership rationales lying in the reduction of environmental uncertainty, compensation for market externalities, and access to idiosyncratic resources, on the other hand the choice of the governance mechanism affects the value captured by the partnership.

While a significant amount of economic activity is undertaken at the public-private interface, research studying how organizations work in this interface is missing from the literature (Mahoney, McGahan, & Pitelis, 2009; Wang & Bunn, 2004). Evaluation of the implementation and managerial issues involved with the delivery of public services at the public-private interface are very important and are also missing from the literature (Bult-Spiering & Dewulf, 2006). Thus, we possess little understanding of how PPPs work once they have been formed, and a number of recent calls have been made enticing organizational scholars to study PPPs and their working (for instance Kale & Singh, 2009; Rangan, Swamii, & Van Wassenhove, 2006; Rufin & Rivera-Santos, 2010; and Strategic Management Society, 2011).

More specifically, we have little understanding of the coordination mechanisms used in the management of PPPs, and what determines their usage. These omissions from the literature relate to the management of the partnership between the public and private actors, and are of prime importance in the
implementation stage, when the PPP mode of project execution has been
decided upon, when the private firm to be contracted has been identified, and
when the contract for carrying out the work has been signed.

**Distinctive Aspects of PPPs**

PPPs are alliances in which government and private firms come together to
deliver a public infrastructure (Rivera-Santos & Rufin, 2010). Government is
philosophically and legally different from private firms (Schaeffer & Loveridge,
2002) and possesses a set of organizational skills and culture very different from
those of a private firm (Kale & Singh, 2009; Mahoney, McGahan, & Pitelis 2009).
Likewise, public infrastructures are very different from private goods, as they
possess qualities of non-rivalrousness of use and non-excludability from use
(Samuelson, 1954), qualities that private goods lack. Both the presence of a
government in the alliance and the delivery of public infrastructure make PPPs
different from for-profit alliances in how they are structured, governed, and
worked (Kale & Singh, 2009).

**Government as an Alliance Partner**

The participation of the government in the alliance makes PPPs different
from for-profit alliances, as the government has objectives very different from the
objectives of for-profit firms (Kale & Singh, 2009), its source of sustenance is
different from that of private firms (Rufin & Rivera-Santos, 2010), it possesses a
unique level of authority, legitimacy, and credibility (Schaeffer & Loveridge, 2002),
and the risk aptitude of government managers is very different (Schaeffer &
Loveridge, 2002).
While private firms exist to maximize private benefits, the objective function of the government is to maximize public benefits (Rangan, Samii, & Van Wassenhove, 2006). Hence, unlike private firms, government is not structured to operate on a commercial basis or to maintain profit and loss accounts, such that the pursuit of profits by the government, which is the objective of a private firm, is often looked upon with suspicion (Rufin & Rivera-Santos, 2010). These differences between the government and private firms mold the ways in which they behave, for instance in their purchase behaviors (Wang & Bunn, 2004). In B2B procurements, while private organizations emphasize profit maximization and seek cost or differentiation advantages (Porter, 1985), the government works towards preventing favoritism, promoting public policy, and ensuring that the taxpayer's dollars get the best value (Wang & Bunn, 2004).

While the government sustains itself by taxing the public, private firms rely on voluntary money market exchanges for their source of funds. As government funds come from the general public, they have to be spent in an unbiased manner, and the government is required to be responsive to the needs of a larger set of stakeholders, who may have directly or indirectly contributed taxes (Rufin & Rivera-Santos, 2010). In contrast, as the funds of a private firm come from the few people who have voluntarily decided to invest the firm works primarily in the interest of these investors to provide them with high returns on their investments.

Further, as taxation is compulsory, the public that provides the tax funds to the government possesses no short-term controls over them. While electoral politics does provide the public a control over the actions of the government, as
elections are sporadic, the public has a distributive view, and the public has a short memory, the controls exercised by the public have a diluted impact. On the other hand, the shareholders of a private firm possess a more immediate control over the firm’s actions by controlling its access to funds. The money markets vary the firm’s valuation and hence its access to funds by continuously monitoring the firm’s past, present, and future performance. The reliance on tax funds also subjects the government to many transparency requirements, like adherence to additional disclosure procedures and following due process and fairness standards (Rufin & Rivera-Santos, 2010). These requirements typically exceed the requirements imposed on private firms (Schaeffer & Loveridge, 2002).

At the same time, the government also possesses a monopoly on making and enforcing laws. This provides it with an asymmetrically high amount of authority (Rangan, Samii, & Van Wassenhove, 2006). Further, the explicit public-spirited objective of the government also gives it a high amount of credibility and legitimacy (Rangan, Samii, & Van Wassenhove, 2006). Private firms cannot match the government’s authority, credibility and legitimacy levels. No matter how intensely the private firm believes in public welfare, demonstrates its commitments to corporate social responsibilities, and acts to defend public interests; in the mind of the public it remains associated with its primary objective of profit maximization.

Also, the managers of the government are required to maintain a high level of transparency, as they are subject to intense scrutiny by the press and other public functionaries, e.g., they are always “under the microscope” (Hughes &
ebrary, 2003; Pirson & Malhotra, 2010). Further, with guaranteed employment public managers do not often see the upside of risk taking, but are instead preoccupied with the downside that risk taking implies. This makes public managers increasingly risk averse and also slow in decision-making (Schaeffer & Loveridge, 2002). Conversely, in the interest of protecting the privately owned assets and business secrets of the firms, managers of private firms take higher levels of risks and maintain discreteness in their dealings.

**Delivery of a Public Infrastructure**

The objective of PPPs is to deliver a public infrastructure. Hence, the characteristics of a public infrastructure make the management of interdependence between alliance partners, in the PPP context, different from how B2B alliances are worked (Mahoney, McGahan, & Pitelis 2009). More specifically, highway public infrastructure has six attributes: high sunk costs, non-tradability of output, non-rivalness on consumption, possibility of price exclusion, and bestowing externalities on society (http://infrastructure.gov.in).

Public infrastructure is a public good, as it possesses both non-rivalrousness of use and non-excludability from use (Samuelson, 1954). However, over time the two-fold categorization of private and public goods has been further refined with the identification of two more kinds of goods, that is toll (club) goods and common pool resources (Ostrom, 2005). In this refined categorization, toll goods, like private clubs, highways, and day care centers, are those that possess a high potential of excludability of use but possess little rivalrousness to use. In contrast, common pool resources, like forests, ground water, and irrigation systems etc., possess high levels of rivalrousness of use but low level of
excludability of use. Toll highways are toll goods as per this categorization. They are excludable in use; the benefits that they bring are restricted to the toll paying public. They also possess non-rivalrousness of use; an addition of an extra vehicle on the highway does not adversely affect the benefits experienced by current users of the road (Rangan, Swamii, & Van Wassenhove, 2006).

Toll highways besides being toll goods are also a natural monopoly. Highway users do not have a viable alternative to buy highway services from other sources, and for all practical purposes there are no other sellers competing for the motorist’s business; realistic alternatives do not exist. Further, in the projects that we are studying, the government even signs a non-competitive clause in the contract agreement. As per this clause, the government guarantees the private firm that it will use its legislative powers to ensure that no alternate highway will be constructed for the validity of the contracted period of time, and also assures the private firm that its monopoly rights to collect tolls from the project will not be diluted. Hence, in PPPs the government temporarily transfers its monopoly rights over the public infrastructure to the private firm.

This temporary transfer of monopoly rights to a private firm is a source of fear in the mind of the public, as possibilities of misuse exist. Delivery uncertainty on part of the private firm, perception of undue alignment between the local government agency and private firm against public interests, and the occasional protests against PPP projects provide evidence that the government is exposed to the opportunism of the private firm in PPPs (Rufin & Rivera-Santos, 2010). The contract signed between the government and private firm exists to maintain
checks and balances and ensure that such a misuse of monopolistic rights does not arise. However, contracts are inherently incomplete, leaving space for manipulation. Such opportunities for misuse of monopoly rights abound during the execution phase, when new challenges emerge in the project and are addressed by reinterpreting contract clauses, reworking contract clauses (often very difficult), or by negotiations out of the contract space.

Highways possess both positive and negative externalities. As a positive externality, the investments made in the highway may benefit the society more than it costs the society to build it. For instance, the public highway built through a PPP not only benefits the toll paying users, but it also indirectly benefits other sectors of the society by opening up new opportunities for economic development. As these opportunities cannot be fully envisioned earlier, the society would not have accounted for these benefits while planning the project, and this makes them externalities. When such externalities emerge out of investments by the government it is understandable, however when they emerge out of investments by private firms in PPPs, the private firm sees these benefits as a result of its actions and would like to appropriate a share of these benefits that the project brings about. However, both the quantification of positive externalities bestowed by the highway and the share of these that the private firm wants to appropriate are ambiguous.

Similarly, highways also possess negative externalities. That is, the returns experienced by the society come at a cost larger than the investments made by the society in the highway project. Under the assumption that both the producers
and users of public goods attempt to externalize costs to the extent possible, negative externalities tend to be at their highest level when the actions of the producers and users are unconstrained (Rangan, Samii, & Van Wassenhove, 2006). Such a situation arises in PPP highways, where the producer of the highways (i.e., the private firm) is distinct from its users (i.e., the toll paying public). Also their actions are unconstrained, as on the one hand the government forsakes its rights to the private firm, while on the other hand road users see tolls as an unnecessary financial burden. While increased intervention, such as a control of the private firm’s actions and legal enforcement on users to pay the tolls, can serve to control the negative externalities, it comes at a cost, and these costs increase with an increase in intervention. While there exists a theoretically optimal minimum cost scenario that achieves a balance in the costs arising out of interventions and the externalities that they address, the basic nature of the public good makes quantification of negative externalities difficult, such that this optimal cost scenario often cannot be determined (Rangan, Samii, & Van Wassenhove, 2006).

In sum, while both positive and negative externalities exist in highway infrastructures executed through the PPP mode, these are often difficult to quantify. Notwithstanding, PPPs need to adapt their working to address both positive and negative externalities that exist in the project.

Investments in public highways are lumpy, indivisible, illiquid, and capital intensive. They are also difficult to value in the intermediate and final stages as they involve numerous taxation and pricing rules, and often possess embedded
options (Dixit, Pindyck, & Davis, 1994). Such an investment, which involves large front-end commitments, leads to a hostage situation for both the government and the private firm in the PPP project (Rufin & Rivera-Santos, 2010). PPP contracts are long-term contracts, and in practice the period of the concession agreement lies between 5 and 99 years. All of this underscores the need for the project agencies to work keep track of the life cycle costs of the project. That is, the various different project agencies need to work in the project while ensuring that is their long-term interest in the project are always protected.

PPPs have been typically viewed as alliances, however a paradox exists on account of the characteristics of public infrastructures that they deliver. The alliance mode of economic opportunity realization is a preferred choice as it inherently provides structural flexibility (Porter & Fuller, 1986). That is, the firm has the flexibility to exit or modify the alliance (Young-Ybarra & Wiersema, 1999). However, PPPs provide no such flexibility in existing models, and the government and private firms are hostages to the partnership (Rufin & Rivera-Santos, 2010). The private firm’s option to exit from the alliance lies in its financial bankruptcy or opting to take a heavy financial beating, as evaluation of the project cost at the intermediate stages is difficult (Dixit, Pindyck, & Davis, 1994). Also, both the government and the private firm possess significant tangible and intangible asset specificity binding them to the project (Young-Ybarra & Wiersema, 1999). That is, the government has a commitment to the public to deliver a highway, and going back on this commitment puts it in an inconvenient political situation. Also, the private firm has lumpy indivisible
investments in the projects that make it difficult for the firm to easily exit the project. At the same time, as highways are a public infrastructure, options for the government to completely exit from them do not exist.

Options to modify the alliance lie in changing the contractual clauses or changing the scope, both of which are very difficult in PPPs. Firstly, the government, which is a partner in the alliance, has to maintain a high level of procedural transparency and follow an extensive and drawn out change procedure, making it difficult to effect even minor modifications to contract clauses. This makes the contractual clauses unduly binding not only in spirit but also in their language. Secondly, as the PPP contractual clauses have evolved out of a decade of governments experience with PPPs, they have strong institutional support. Hence, any attempts at changing them not only require the change to be argued with very sound and convincing logic, but the need for changing them must also be communicated to and accepted by a diverse set of project participants. Hence PPPs, while being alliances, do not provide flexibility of exit or modification, one of the primary advantages of B2B alliances.

Partnerships are formed when the agencies joining in partnership are able to bring a complementary set of resources and capabilities (Kale & Singh, 2009). In the context of delivery of public infrastructure, like highways, the private firm brings to the project a superior set of technical and managerial skills, an efficient delivery process of construction projects, and significant financial muscle to invest in the project (Hart, 2003, Rangan, Swamii, & Van Wassenhove, 2006). The government, on the other hand, brings credibility and legitimacy to the
project and stands guarantee for the project risks (Rangan, Swamii, & Van Wassenhove, 2006). While these are complementary in nature, the government and the private firm also bring their differences to the project. Differences in their organizational cultures, paradigms, and ways of working, result in challenges in bringing their complementary capabilities together in the project to pursue a common objective.

The Formation and Structuring of an Indian Highway PPP Project

The mainstream adoption of the PPP mode for public infrastructure upgradation can be attributed to the success of the Public Finance Initiative (PFI) of the United Kingdom (Delmon, 2010). With its successful PPP experience, the government of the United Kingdom has significantly contributed to building up the worldwide knowledge base on PPPs, and has liberally shared its experiences with the world community. Guided by this knowledge and the experience of not just the UK government but also other national governments, the Indian government’s PPP practice has significantly evolved in the last decade. Specifically in the Indian highway sector, this has resulted in the evolution of a standardized process for formation and structuring of PPP projects, which has widespread institutional support. This section describes this standardized process with the objective of gaining insights into the working of PPPs in the Indian highway construction sector.

Formation of PPPs

The formation of PPPs is a multiple stage process. In the first stage, the government identifies the highways that require upgradation based on user demands and political considerations. The services of a consultant are then
requisitioned to carry out a Detailed Project Feasibility (DPR) study of the project. While carrying out the DPR study, the consultant: studies the traffic and civil engineering requirements of the project; estimates the project’s costs, risks, timelines, resource requirements, traffic projections, and environmental impact; and evaluates the various scenarios of project implementation. Based on this study, the consultant prepares detailed financial and technical specifications of the project. This study forms the basis on which the government decides the mode of project execution (i.e., PPP or arms length contract), nature of the project (i.e., DBFO, BOT, BOLT or other), and the cost-revenue allocation and sharing arrangements to be used (i.e., toll, positive grant, negative grant or annuity).

In the second stage, the government invites bids from private firms to undertake the project. The private firms base their financial and technical bids on the project specifications provided in the DPR and their prior experience in the construction domain. The government evaluates the bids across different financial and technical parameters and selects the firm for carrying out the project whose bid provides maximum value to the public. A letter of intent is then issued indicating the government’s intention to award the project work to the firm. Before it can start work on the project, the private firm is required to seek financial backing from the money markets and achieve financial closure for the project. Furthermore, the private firm is required to create a project-specific organization, distinct from itself, called the special purpose vehicle (SPV). After having achieved financial closure for the project and having created the SPV, the
firm approaches the government to sign the long-term concession agreement for the project. The government signs this agreement not with the firm, but with the SPV, which is tasked with upgradation, operations, and final transfer of the highway back to the government at the end of the contract period.

**Execution and Management of PPPs**

The SPV has complete financial and managerial control over the project, and locates all the project activities within it. While from an accounting perspective the SPV is simply an escrow account, from an organizational perspective it is a distinct entity, possessing: an entity with the registrar of companies, a balance sheet, a distinctive set of managers on its payroll, a distinct set of roles and responsibilities, an organizational structure, and its own stream of revenues and expenses.

While the lifespan of an SPV is the contract period, it can be split into two distinct phases: the construction period (i.e., the initial 2-3 year period), in which the highway is upgraded to the DPR specifications; and the concession period (i.e., the post construction 5-99 year period), in which the highway is maintained to the specifications given in the DPR and finally transferred back to the government (Hart, 2003). This research focuses on the construction period of the SPV’s life, as it is during this period that coordination between the various project stakeholders is of prime importance. Also, the execution of work in the construction period lays the ground for a smooth working of the project during the concession period.

During the construction period, the SPV has multiple roles to play and interacts with a diversified set of project stakeholders. To ensure that the project
meets its cost, time, and quality objectives, the SPV has to: manage inflow of funds to finance the construction activities; ensure that land and permissions are available in time to start construction; manage the civil construction activities; monitor the quality of the project; and ensure the flow of manpower, machinery, design expertise, and other resources to the project. For this, the SPV has to interact with a broad spectrum of project stakeholders, which include the equity-owning private firms, project debt financers, project designers, government agencies, local bodies, specialized consultants, civil contractors, and machinery and plant suppliers. The multiple roles that the SPV has to play, and the large numbers of interfaces that it has to manage with the large number of project agencies, gives rise to a large number of coordination challenges and makes the SPV the central coordinating agency in the project.

While a large number of agencies are involved with the SPV, the coordination of work in the SPV is primarily handled by the Project Manager (PM) whom the equity holding private firm assigns to the project. It is the PM who is finally responsible for ensuring that the project meets its time schedules, budgets, technical specifications, and quality objectives. The PM heads the SPV and holds the final authority over the project.

Highways, being public infrastructure, not only require access to public land to construct the highway, but also numerous government clearances in order to work. For instance, forest departments clearances are required to remove trees in the right of way and local municipal authorities clearances are required to dislocate water pipelines and electricity distribution networks
Since in PPPs the government partners with a private firm for delivery of public infrastructure, the government sets up a local office and posts a Project Director (PD) to liaison with the project. This local office enables the project by provisioning the right-of-way and clearances at the local level. In the Indian highway context, the delay incurred by the government in handing over right-of-way to the SPV has been found to be one of the primary elements that adversely affect the pace of the work, and has been identified as one of the most important situations that requires frequent interactions. This makes the PD one of the main coordinating partners of the PM in the project.

Construction projects by their very nature are complex, requiring thousands of activities to be planned and executed, and this complexity increases in the case of highway projects that are subject to many stakeholder and geo-technical risks. For instance, highways pass through villages, cities and towns, and the local population may require changes in highway alignments to protect religious structures in the way. Also, in some places the soil conditions and other geo-technical characteristics may change suddenly, requiring the contractor to rework the design of the highway. To accommodate these changes the construction contractor is seldom able to follow the detailed specifications as laid out in the DPR, in letter or in spirit, and deviations from project specifications need to be made. Whenever such deviations occur, the contract terms need to be revisited and the concerns resolved, while giving due consideration to their financial implications. In PPPs, these issues can emerge as a source of dispute between
the private firm and the government, and lead to arbitration and legal battles that
delay the project. The resolution of these issues on a continuous basis is of
prime importance for the success of these projects (Iyer, Chaphalkar & Joshi,
2008). Hence, the need for a permanent neutral intermediary exists. In PPP
projects, this permanent intermediary role is attributed to a third party agency
called the Independent Consultant (IC), which is appointed jointly by the
government and the private firm. The IC’s role involves: verifying and assuring
that the project is done as per the DPR; allowing, guiding, and certifying any
changes made to the project; and serving as the first level for dispute resolution.
The important role of the IC makes it an important agency, with whom the PM
has to coordinate the project work on an ongoing basis.

The coordination of work has both structuring and emergent aspects
(Okhuysen & Bechky, 2009, McEvily, Perrone, & Zaheer, 2003). While the SPV
emerges as the central body tasked with structuring coordination in PPP projects,
the emergent coordination of work in the PPP context is carried out between the
PM, PD, and IC. This study focuses on the construction stage of highway
upgradation and construction PPP projects in India, all of which are structured
using SPVs. Hence the projects studied are similarly structured. This enables us

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1 As per the most recent practice of the appointmenting an IC in the Indian
highway sector, the government provides the names of five eligible ICs to the
SPV to rank its first three choices. The government then selects the consultant
out of the three consultants shortlisted by the private firm. Also, while the
government pays the consultant for the work performed, 50% of this money is
compensated by the SPV, making the IC obliged equally to the government and
the SPV. This arrangement of sharing cost coupled with an appointment process
by joint consultation, is aimed at ensuring that the IC works in an unbiased
manner in its assigned job.
to shift focus from structuring to emergent aspects of coordination, and this study seeks to investigate the emergent aspects of coordination among the key project participants, more specifically how the PM coordinates the PPP, working with the PD and the IC.

**Structuring of PPPs to Address their Distinctive Aspects**

In contrast to B2B alliances, the presence of the government and the delivery of a public infrastructure pose some unique challenges to the management of PPPs (Kale & Singh, 2009). While comparing the governance of PPPs and B2B alliances, Rufin & Rivera-Santos (2010) found them to be different in their structuring (i.e., equity participation and scope of work), and also in their emergent aspects (i.e., use of trust, creation of hostage situations), and stakeholder involvement. Hence, the distinctiveness of PPPs lies in both their structuring and their emergent aspects.

The distinct aspects of PPP structuring lie in the specification of a common objective function, the containment of PPP working within the SPV, and the use of ICs. While Chapter 4 examines how the distinct emergent aspects are addressed in PPPs, the distinct structuring aspects are discussed next.

The difference in the objective functions of the private firm and the government can be partially mitigated by the specification of a common objective function, like globally sustainable value creation (Mahoney, McGahan, & Pitelis 2009). This provides a common platform for public-private interactions and also a unifying concept. As PPPs are formed with the primary objective of upgrading and maintaining an infrastructure, this objective provides the unifying concept in pursuit of which the private firm and the government can work together, despite
their many differences. While stipulating the conceptual unifying framework, the common objective functions of the PPP becomes formalized and specified by the contract signed for executing the project. This contract serves not only to restrain the asymmetric authority of the government by providing compensation to the private firm in the case of unilateral decisions by the government, but it also restrains the private firm from engaging in the sole pursuit of profit. Further, the objective also lays down a common platform for the different agencies to work together in delivering a piece of public infrastructure, despite the different areas of expertise and worldviews that the diverse agencies bring to the project.

The distinct organizational identity of the SPV separates both the government and the private firm from the project. This separation structures the PPP such that the differences between the government and the private firm can be kept at bay and ensures that their risk profiles do not affect one another. That is, the government is not exposed to the broad business risks that the private firm faces in the other businesses that it manages, besides the focal project. Similarly, the private firm is insulated from the general working of the government, and the many political, economic, and financial activities that the government is involved with in its different roles.

The distinct identity of the SPV and the manner in which it separates the project from its dominant stakeholders (i.e., the government and the private firm), ensures that the dominant paradigms of these stakeholders do not come in the way of achieving the common objective of the project. More specifically, this separation ensures that the project is neither overburdened by the government’s
public welfare role, nor by the private firm’s sole pursuit for profit maximization. Hence, the effects of the government’s welfare objective and the private firm’s profit pursuits can be restrained from significantly affecting the project. At the same time, the SPV also insulates the project from exposure to the risk profile of the government and the private firms.

Along with creating the separation, the SPV also localizes the sources of revenue, expenses, and controls in the project. On the one hand, it restricts the base of tax collection (i.e., the toll charges), to those who use the infrastructure, and ensure that the tax paying public (toll paying public) is who gains from it. On the other hand, it ensures that toll revenue collected from the infrastructure is first deployed in its upkeep, before finding its way into the government’s treasury. By doing this, the SPV dilutes the general public’s control over the actions performed in the project. At the same time, the accountal of revenues and expenses of the project at the SPV level ensures that the project revenues are first used to fulfill the project’s needs, before appropriating the surplus as profit to the parent private firm.

The IC, which is a permanent intermediary in the project between the private firm and government, also plays an important role in structuring PPPs. The IC is tasked with balancing the different risk aptitudes of private and government managers, handling the positive and negative externalities, providing flexibility to the project in adapting to its specific contexts, balancing the differences in expertise between them, and helping to monitor the project to ensure that monopolistic rights are not misused. For the private firm, the IC
protects it from the asymmetric powers of the government, and makes the government managers accountable for their actions. For instance, the inability of the government to provide the right of way for the highway construction work to start results in both resource wastage of the contractor and delay in the project. The IC in this case studies the specific instance to work out the financial implications of the event, and to what extent the government needs to compensate the project for the same. In addition, the IC provides the government with expertise in the highway domain, and assists it in monitoring the project. As the IC can work out the financial and technical implications of project changes, it brings in flexibility in working of PPPs by interpreting the difficult to change contractual clauses. Further, the IC ensures the quality of the project during the execution stages, thereby ensuring smooth handoff of the project from the SPV to the government at the end of concession period. It also serves as the locally available and first stage dispute resolution machinery for the project.

In PPPs, information asymmetry exists between the principal (i.e., the government) and the agent (i.e., the private firm) (Laffont & Tirole, 1993). From a structuring perspective, this information asymmetry can be addressed by bringing in competition for the market (Davidsson, 2010), or by putting in place high-powered schemes that provide an incentive for the private firm to be efficient (Laffont & Tirole, 1993). Information asymmetry can also be addressed by the use of organizational forms, which are distinct from their members (Koschmann, Kuhn, & Pfarrer, Forthcoming). Organizational forms like SPVs not only enable a display of collective agency by the different agencies coordinating to perform the
work, but they also build a capacity to achieve outcomes that are beyond what the individual organizations can achieve (Koschmann, Kuhn, & Pfarrer, Forthcoming). In the structuring of PPPs, both the SPV and IC can be seen as instantiations of such collective agency and high-powered schemes, respectively, which serve to address the distinct aspects of PPPs.

However, each of these is a structuring mechanism that lays the ground for coordination in the project. From an emergent perspective, they guide the coordination of the PPP task, but by themselves do not carry out coordination of the work. Chapter 4 studies the emergent aspects of PPP working, specifically identifying how the focus of the private firm’s primary line of business and the experience profile of the manager molds the working of PPPs, while recognizing that PPPs accomplish their work by carrying out coordination.
Figure 3-1. Structure of a PPP. Coordination by the special purpose vehicle (SPV)
<table>
<thead>
<tr>
<th>Aspect</th>
<th>Common objective</th>
<th>SPV</th>
<th>IC</th>
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<tr>
<td>Government as an alliance partner</td>
<td></td>
<td></td>
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<tr>
<td>Different objective function</td>
<td>Unifying concept</td>
<td>Create distance</td>
<td>Manage disputes</td>
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<td></td>
<td>Common platform</td>
<td></td>
<td>Technical expertise</td>
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<tr>
<td>Different source of sustenance</td>
<td>Quantify</td>
<td>Create distance and localize</td>
<td>Manage on behalf of government</td>
</tr>
<tr>
<td>Asymmetric authority, credibility, and legitimacy</td>
<td>Contract</td>
<td>Create distance</td>
<td>First level mediator</td>
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<tr>
<td>Risk averse government managers</td>
<td>Common platform</td>
<td>Restrict exposure</td>
<td>Intermediary</td>
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<td>Delivery of public infrastructure</td>
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<td>Toll good and monopoly</td>
<td>Unifying concept</td>
<td>Localize</td>
<td>Monitor private firm</td>
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<tr>
<td>Positive and negative externalities</td>
<td></td>
<td>Localize</td>
<td>Ascertain and quantify them</td>
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<tr>
<td>Lumpy, indivisible, and long term investments</td>
<td>SPV life as</td>
<td>Individual contracts</td>
<td>Provide unbiased assessment</td>
</tr>
<tr>
<td>Difference in expertise</td>
<td>investment life</td>
<td></td>
<td>Compensate for government's lack of expertise</td>
</tr>
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<td></td>
<td>Individual</td>
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CHAPTER 4
THEORY AND HYPOTHESES

As the coordination of work in organizations can be carried out with many different mechanisms, heterogeneity exists in the working of firms even when they seek to accomplish similar tasks. Accordingly, when one is exploring firm heterogeneity, a need to identify and study the antecedents of the use of different mechanisms of coordination exists. While the organizational literature has identified these antecedents to lie primarily in task characteristics, this study argues that these antecedents could also lie in the firm’s focus of experience, as well as the experience profile of the managers whom the firm deploys. In order to study how work is coordinated at the boundaries of a firm, a conceptual model is suggested, and a number of hypotheses proposed.

This chapter first discusses the different mechanisms that a firm can use for coordination at its interface, and then puts forward four main hypotheses. These hypotheses argue that two different kinds of focus (i.e., focus on the highway sector and focus on the PPP way of working), which are relevant in the context of PPP highway construction projects, potentially influence the emphasis placed on the use of different coordination mechanisms. Building on this perspective, it is argued that the managers deployed by the firm to carry out coordination at its interface are likely to mold the emphasis placed on the use of coordination mechanisms. Accordingly, as different kinds of managerial experience may affect the use of coordination mechanisms, twelve hypotheses are proposed, arguing for the moderating effects of manager’s highway experience, PPP experience, and tenure with the firm, on the main effects of firm’s focus.
Different Mechanisms of Coordination

Different streams of literature conceptualize a firm either as a bundle of contracts, a bundle of routines, or a bundle of social relations. These distinct conceptualizations attribute the diversity in how firms coordinate their work to different reasons. For instance, transaction cost economics literature views the firm as a bundle of transactions managed by contracts (Coase, 1937), and attributes the heterogeneity in the firm’s way of working to the different ways in which contracts are used and managed. Organization routines literature views the firm as bundle of routines and procedures (Nelson & Winter, 1982), with the firm primarily concerned with optimally managing them. Here, the diversity among firms is attributed to the difference in how they manage and deploy routines in order to coordinate their work. Social relations literature views the firm as a bundle (or network) of relationships, with firms managing these relationships in many diverse ways. Thus, the three streams of literature emphasize theoretically different mechanisms by which firms coordinate their work. That is, the use of contractual structuring, the use of boundary objects to deploy routines and procedures, and the use of common ground in relationships. However, this study of coordination refers to the work that firms perform both within and at their boundaries, with organization and alliance literatures, respectively, focusing on each.

Coordination by Structuring of Work

Whenever two or more agencies come together to perform work, their objectives for cooperation are unlikely to be the same. In such circumstances, the firms make use of ex-ante and formal structuring mechanisms, like contracts, to bring about consensus between the agencies regarding their expectations and their responsibilities. The contract aligns the objectives of the agencies involved, and guide the coordination of
work both in the present and the future. With this perspective, formal structuring mechanisms such as contractual documentation, employment contracts, or organizational structures emerge as important mechanisms to bring about coordination by achieving authority, formalization, and/or centralization.

**Coordination by Use of Boundary Objects**

Repetitive work performed at the firm’s boundaries results in the enactment of specific objects. These objects manifest over time as the need for them is identified; then they are adapted to the context, and finally implemented. These objects serve to mitigate the cognitive challenges that managers face in accessing, sharing, and storing knowledge at the firm’s boundaries (Kellogg, Orlikowski, & Yates, 2006), while at the same time bringing about agreement, predictability, and common understanding between the agencies coordinating the work (Okhuysen & Bechky, 2009). Timetabling, scheduling, adoption of procedures, and deployment of formal information systems are some such objects that firms enact and deploy to accomplish work at their boundaries, and we refer to them as purposive enacted boundary objects for coordination. As the enactment of these boundary objects takes place in a specific context, which itself is likely to mold what they are, specific to the present context of highway construction, I refer to these as highway specific boundary objects (HSBOs).

**Coordination by Use of Common Ground**

Along with using coordination mechanisms, like contracts and structures that are ex-ante, and the enactment of purposive boundary objects for coordination, firms may create common ground between the coordinating agencies. Common ground makes way for tacit and spontaneous coordination mechanisms to manifest, as and when the need arises, recognizing that economic transactions occur in a social context. In order
to bring about coordination, common ground relies on the use of: social relationships, trust, common knowledge, shared characteristics, social norms, cultural and informal interactions, prior relations, and mutual adjustments. Common ground addresses coordination challenges through mutual adaptation and adjustment of the agencies to one another’s needs, and also enables need-based enactments and the use of boundary objects for achieving coordination, with no ex-ante specifications. However, while common ground allows for the use of spontaneous mechanisms of coordination, the development of common ground itself is not spontaneous, and firms working together must recognize the need for it, work towards creating it, and finally deploy it.

**Firm’s Focus and Coordination**

A firm’s experience not only guides its intentions, ex-ante, but then also guides the actions a firm takes in organizing and coordinating its work. Empirically, in cross-industry samples, the firm’s alliance experience has been found to mold the firm’s ex-ante choice to form an alliance or not (Gulati, 1995), and also the specific design of alliances (i.e., joint venture or licensing contracts (Anand & Khanna, 2000)). At the same time, in the context of the biotechnology industry, a firm’s alliance experience has been found to affect the management and governance of its alliances by molding the post formation dynamics in alliances, such as changes in board compositions, alterations in contracts, and changes in monitoring mechanisms (Reuer, Zollo, & Singh, 2002). While these studies focus on the effects of a firm’s alliance experience, the experience of a firm can be conceptualized in many different ways. That is, a firm’s diversification experience can be viewed as experience in related and unrelated domains (Palich, Cardinal, & Miller, 2000), its innovation experience can be seen as experience with exploratory or exploitative innovation (Hoang & Rothaermel, 2010), and
its alliance experience can be viewed as partner specific or as general collaborative experience (Zollo, Reuer, & Singh, 2002). The identification and measurement of the different kinds of experience becomes all the more important, as the different kinds of experiences differently affect a firm’s performance (Palich, Cardinal, & Miller, 2000).

While the conceptualization and categorization of a firm’s experience becomes complex with the diversification of a firm’s business portfolio, a simplifying alternative exists, in conceptualizing the firm’s experience in terms of the extent of focus that it has on the focal line of business. The focus of a firm on its product and its business portfolio has been recognized as the central issue faced by every firm (Rivkin & Siggelkow, 2003), and a rich research tradition studying the consequences of a firm’s focus of experience exists. For example, Skinner (1974) has argued that a manufacturing firm’s focus is of prime importance for it to withstand competition, Fulghieri & Sevilir (2009) have found the focus of venture capital firms to be a key antecedent to the performance of entrepreneurial startups they fund, Huckman & Zinner (2008) have found the focus of biopharmaceutical firms to affect operational performance, and, more broadly, the corporate strategy literature has found the degree of a diversified firm’s focus to affect its performance (Palich, Cardinal, & Miller, 2000).

A firm’s focus enables it to create a comfort zone in the focal activity and develop a deeper understanding of how the activity is carried out (Skinner, 1974). A source of some these advantages is the specialization and division of labor that focus brings (Taylor, 1911; Smith, 1776). A firm’s focus also limits the set of conflicting and competing operational activities in which the firm’s workers and managers are engaged (Skinner, 1974). By limiting the range of the firm’s activities, the focus frees up
managers from the operation of activities unrelated to the core business, and enables them to focus on the core business to which their managerial skills are more suited (Mahlotra, & McLeod, 1997). It also reduces the ambiguity the firm faces as it is exposed to a lesser variety or ways in which work can be done (Skinner, 1974), and helps to bring about clarity in how the focal activity is to be performed (Taylor, 1911; Smith, 1776). A focus reduces the efficiency losses for the firm, as the firm is no longer required to transfer its core business competencies to widely varying markets where they may not be the most efficient (Montgomery & Wernerfelt, 1988). In the context of venture capital firms and the entrepreneurial startups that they fund, the focus of such firms on the business activity of the startup enables the parent venture capital firm to add more value to the startup. It also limits the competition that the entrepreneurial firm faces for the limited resources of the venture capital, and reduces the ability of the parent to extract rents, as focus increases the parent’s commitment to the startup (Fulghieri & Sevilir, 2009).

While the firm’s focus affects how it coordinates its work, conceptualization of focus can be challenging, as firms can focus around product lines, process technologies, or geographic or customer groups (Hayes, Pisano, Upton, & Wheelwright, 2005; Huckman & Zinner, 2008). However, specific to the context of interest, these multiple dimensions may overlap substantially, such that focus along two or more dimensions may become indistinguishable (Huckman & Zinner, 2008; Ketokivi & Jokinen, 2006). Regrading PPP highway construction, two dimensions of a firm’s focus emerge as important: the firm’s focus on highway construction (technical domain), and on the PPP way of working (organizational domain). These two kinds of focus entail very different
approaches to work. A firm’s focus on highway construction (i.e., the extent to which prior experience comes from highway construction) enables the firm to develop a common and uniform (highway sector specific) understanding between the firm and the project’s levels of working, reduces conflict and ambiguity about how to work on the project, allows it to specialize in the construction of highways, and creates a unique set of sector-specific work practices. On the other hand, a firm’s focus on the PPP way of working (i.e., the extent to which prior experience comes from PPP projects) enables the firm to develop a deeper understanding of how to form and operate SPV’s, develops the firm’s capabilities in managing projects for which risks of different kinds are bundled and attributed to the firm, and utilizes work practices that can be easily shared with other project agencies and which are high in transparency, all of which are specific and unique to the PPP way of working.

**Firm’s Highway Focus and Use of Coordination Mechanisms**

Highway construction is a unique construction domain in a number of ways. Firstly, highway construction involves numerous repetitions of a relatively small set of tasks. Accordingly, it requires the use of linear scheduling and planning tools, in which the project resources need to be optimized for continuous usage. Linear scheduling has its own unique challenges and while standardized software solutions implementing linear scheduling are available, they are not widely adopted in the highway construction industry.\(^1\) This is in sharp contrast to the construction industry’s practice of using network-scheduling techniques (i.e., PERT and CPM methods) to schedule a complex network of task antecedents and precedents to optimize the use of project resources.

\(^1\) This claim is based on personal communication with two professors of construction management at the University of Florida who focus their research on highway construction, and a highway planning professional.
This scheduling can get very complex, necessitating the use of complex scheduling algorithms. Hence, almost all large-scale construction projects adopt one or another readily available standard software packages which implement these algorithms.

Secondly, highway projects, while involving numerous agencies, are also exposed to a large number of environmental uncertainties as they are longitudinally laid out. The construction activity is required to be carried out over long lengths of highways, which pass through urban, suburban, and rural landscapes. This exposes the project to the actions of a diverse set of public agencies that need to contribute crucial project resources, like permanent and temporary rights of way. In order to secure these crucial resources for the project, the firm is required to liaison with a diverse set of public agencies, like local population, town, and district administrations, as well as the primary government client. However, it is important to note that the uniqueness of highway projects does not arise out of the complexity of concurrently working with a large number of agencies, which is a common feature of almost all large construction projects, but rather from the public nature of the external agencies.

Thirdly, when constructing a highway the government (client) contracts with the private firm (contractor) using arms length contracts, wherein the private firm constructs the highway on public land. The involvement of the government makes the coordination challenges in this context unique, as the government is philosophically and legally different from private firms (Schaeffer & Loveridge, 2002): it works towards a different set of objectives (Kale & Singh, 2009; Rangan, Samii, & Van Wassenhove, 2006), it works using a different set of rules and regulations (Mahoney, McGahan, &

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2 In the Indian highway sector 99% of the highways are owned by the government (India Infrastructure Research, 2010)
Pitelis 2009; Wang & Bunn, 2004), and it possesses a different organizational culture and set of skills (Rufin & Rivera-Santos, 2010).

Lastly, contracts with public agencies are one-off contracts, in which each highway project is competitively bid out by the public agency. Individual bids are evaluated based on their own merit, with little financial consideration of similar prior relationships or consideration of difficult to quantify aspects, like trust and social relations. At the same time, as contracts between private firms and public agencies are one off, short term, and arms length contracts, they provide little scope for a shadow of the past or a shadow of the future to manifest (Henisz & Levitt, 2009). On the other hand, the strategic alliance literature, while studying alliances among private firms, emphasizes that the use of trust, social relations, and common understanding enables firms to more efficiently coordinate with their collaborators, molding the firm’s choice of alliance partners (Gulati, 1995). This literature also argues that transactional efficiency comes about both due to both the shadow of the past (Blau, 1964; Granovetter, 1985, Gulati, 1995) and the shadow of the future (Axlerod, 1981; Ring & Van de Ven, 1992; Parkhe, 1993; Poppo, Zhou, & Ryu, 2008).

**Firm’s highway focus and use of boundary objects for coordination**

In the absence of standardized and widely accepted tools to schedule and plan projects in the highway domain, firms focusing on highway construction tend to develop firm-specific templates for carrying out scheduling and planning, like customized, spreadsheet-based, linear scheduling charts. Further, in an attempt to address the complexity involved in concurrently working with a large contingent of external stakeholders, as well as the uncertainties that they bring in, firms focusing on highway construction develop a unique set of monitoring practices for coordinating the work,
using tools like periodic abnormality reports, meeting formats, dispute resolution registers, etc. While the amount of experience the firm has in handling highway projects determines the degree to which these highway specific practices are developed and standardized (i.e., HSBOs are developed and standardized), the adoption of the practices (like HSBOs) lies in the recognition of the benefits that come from their usage. And it is the firm’s focus on the highway construction sector that brings about this recognition.

In the case of a firm with a high focus in the highway sector, HSBOs are embedded in firm level routines and are used during the coordination of work with others (Nelson & Winter, 1982; Baum & Ingram, 1998; Argote, 1996). However, to work on a new and distinct project outside of its boundaries (like highway projects), the firm needs to transfer the firm level routines and the HSBOs embedded in them to the focal highway project setting (Szulanski, 1996). While the experience of the firm increases the embeddedness of the HSBOs in the firm’s way of working, and enables their autonomous and mindless application in the project (Ashforth & Fried, 1988; Becker, 2004; Nelson, 1994), it is the focus of the firm which allows it to unambiguously decide on them for adoption.

On the other hand, a firm with a low focus on the highway sector derives only a small part of its experience from working therein, and a larger part from its construction activities in more conventional construction sectors, like office complexes, townships, power plants, shopping centers, etc. Unlike the highway sector, these sectors do not involve a linearly laid out construction site. The decrease in the firm’s focus on the highway sector dilutes its expertise in the sector, as the founding managers do not
possess expertise in the diversified portfolio, and such diversification comes about at the behest of the subsequently appointed corporate managers (Klepper, 2002). The dilution of expertise also comes about since the corporate managers of the firm do not appreciate the unique aspects of the focal line of business (Lu & Beamish, 2001, 2004), as well as because diversification allows these corporate managers to use skills that may not be the most suitable for use in the focal sector (Mahlotra, & McLeod, 1997). Hence, managers located in firms with less highway focus tend to reduce emphasis on the use of HSBOs.

Further, when a firm manages a large number of business lines, its coordination costs increase, and in an attempt to reduce these costs, corporate managers attempt to aggregate diverse activities by emphasizing the use of common monitoring, control, and coordination systems across its business lines, and shunning the use of context specific objects. While this aggregation may decrease coordination challenges at the corporate level, it increases them in individual business lines, as the common system that has evolved is a compromised one, which aims to satisfy multiple needs of the different business lines at the same time. For instance, the management of a construction firm often attempts to integrate the planning and monitoring of all its construction business lines using standardized enterprise project management tools commonly deployed in the construction industry, like Enterprise Microsoft Project® or Primavera® enterprise systems. These systems shift the focus of project management from individual projects to the management of project portfolios. However, this aggregation to the level of project portfolios is not suitable for the highway sector, as it requires linear scheduling, while these systems use network-scheduling techniques. Consequently, the actions of
the corporate managers, which are targeted towards integrating the planning and monitoring of different construction business lines, compels the highway line of the firm’s business to either work inefficiently by using the network scheduling tools, or to develop new interfaces to its linear scheduling practices and HSBOs, increasing inefficiencies.

In a highway project, firms work closely with other organizations (i.e., National or State highway public authority and technical consultants) that specialize in highway construction and understand HSBOs. Accordingly even beyond efficiency consideration, highway projects require the firm to use HSBOs to address the legitimacy and institutional pressures brought about by the highway specialized agencies, with whom the firm is required to coordinate work.

Hence, a decrease in focus on the highway sector dilutes the firm’s expertise, enhances causal ambiguity about the use of HSBO’s while working on the project, and forces the use of coordination practices that may not be the most appropriate for the context. Consequently, in the case of a firm with a low focus on highway business, the set of practices and boundary objects used for the coordination of work with other project agencies is likely to be a compromise between the requirements of the multi-business-focused corporate entity and the highway specific organizations, with whom the project work requires coordination. Hence, I hypothesize,

Hypothesis 1a: The relationship between the firm’s focus on the highway sector and the emphasis it places on the use of HSBOs for coordination with other agencies in carrying out work in the project, is positive.

Firm’s highway focus and use of common ground for coordination

Highways are a public infrastructure, and it is the responsibility of the government to provide the public with a good public transport infrastructure. Hence, traditionally the
upgradation of highways has been taken up by outsourcing the construction activities to private firms using short-term arms length contracts, wherein the private firm works as a contractor to the government. These contracts between the government and private firms limit the risk exposure of the private firm by providing a clear division of roles and responsibilities. Further, such arms length contracts provide an elaborate set of dispute resolution mechanisms and also provide for arbitration and legal remedies for conflict resolution, if conflicts arise. As such contracts have evolved out of decades of government outsourcing of highway construction to private firms, the government has accumulated experience in handling them, and such contracts have become more and more complete with time. At the same time, private firms also gain experience in managing public contracts with the government, and reduce their exposure to the construction projects risks. With this increased experience in managing risks at both the government and private firm levels, the use of common ground for coordination of project work gets deemphasized.

The government, in general, is required to maintain a high level of transparency and fairness while bidding out public contracts (Wang & Bunn, 2004). Hence, public contracts allow little opportunity for a shadow of past or a shadow of the future to manifest. More specifically, the evaluation of bids for awarding public contracts, like highway construction contracts, cannot take into account unquantifiable aspects, like trust, social relations, or prior partner-specific experience, (Axlerod, 1981; Gulati, 1995; Parkhe, 1993; Poppo, Zhou, & Ryu, 2008). Consequently, highway construction focused firms find little benefits coming from investments in building common ground with the government at the project level. At the same time, the significant differences between
private firms and the government makes the generation of common ground between them very time consuming and effort intensive (Kale & Singh, 2009; McGahan, Mahoney, & Pitelis 2009; Schaeffer & Loveridge, 2002; Rangan, Samii, & Van Wassenhove, 2006; Rufin & Rivera-Santos, 2010; Wang & Bunn, 2004).

Besides the above arguments, in less developed institutional environments (e.g., developing economies), the presence of common ground between two agencies that transact using a well specified and seemingly complete arms length contract can lead to a compromise of the contractual obligations of the parties and result in counterproductive results (Rui, de Jong, & ten Heuvelhof, 2008).

On the other hand, a construction firm with less of a highway focus is guided by the practices that it adopts more widely in the construction sector, wherein the clients are not the government but other private firms. In contrast to short-term contracts between government and private firms, short-term contracts between private firms provide a rich ground for both the shadow of the past and the shadow of the future (from one contract to another) to manifest and play an important role in guiding work (Henisz & Levitt, 2009). For example, a prior relationship between the client and the supplier in the construction industry lays the foundation for common ground to emerge in the current project. Furthermore, good coordination in the present project increases the firm’s chances of securing future contracts with the same clients. Such considerations make firms with low highway focus emphasize the use of common ground for coordination, guided by their experience in carrying out construction for private firms.
Hence, an increase in a firm’s focus on the highway sector reduces the emphasis that it places on the use of common ground for coordination, leading to the second hypothesis.

Hypothesis 1b: The relationship between the firm’s focus on the highway sector and the emphasis it places on the use of common ground for coordination with other agencies in carrying out work in the project, is negative.

**Firm’s PPP Focus and Use of Coordination Mechanisms**

The PPP focus of a construction firm exposes it to the unique aspects of PPP projects, like bundling of project risks (Chen & Chiu, 2010) and the use of SPVs for working the project. As the private firm has to make large front-end investments in PPP projects, and these investments have long pay back periods, the bundling of risks increases the risk exposure of the private firm. For instance, in PPP projects the construction firm shoulders risks which span a number of domains and go beyond the typical construction project risks, like design fault risks, cost and schedule over-run risks, and project completion risks, to also include PPP-specific risks, like fiscal risks, residual value risks, and bidding or opportunistic renegotiation risks (Checherita & Gifford, 2008). The risk exposure of a PPP focused firm is in sharp contrast to the risk exposure of construction firms that work as contractors in typical construction projects. In the later, the construction firm only shoulders the construction risks of the project, and that too for a relatively short duration of the construction period, which spans 2-3 years in contrast to the 5-99 years of risk exposure in PPP projects.

In PPP projects the work is executed by the SPV, which is a dedicated organization created for the project and distinct from the private firm. SPVs possess unique characteristics, such as having ownership rights over public assets and
monopolistic rights for revenue collection from public, and a different kind of working, as
the efficiency gains in both project construction and operation are required to be shared
with the government.

The unique aspects of PPP projects affect how firms coordinate their work, as the
bundling of risks affects the motivations with which the private firm approaches the
project, and how the SPV localizes the joint actions taken by the various project
agencies. Hence, firms that focus on PPP projects build a long-term focus, become
adapt at shouldering a larger bundle of project risks, and possess the unique expertise
of working in an SPV.

Firm’s PPP focus and use of boundary objects for coordination

To work in an SPV, which lies outside the firm boundary, and to shoulder a larger
bundle of risks over the project’s long life, firms need to use coordination mechanisms
that can create and leave a trail. Further, in contrast to general construction projects in
which the private firm can pocket all the returns coming from efficient operations, in PPP
projects the rate of returns of the private firm are often contracted to lie in a pre-
determined range. The government keeps a tab on the rate of return achieved by the
private firm, and the concession period of the PPP may be varied up or down to ensure
that the returns lie in the contracted range. This level of monitoring by the government is
only possible if the coordination mechanisms of work leave an explicit trail behind them.

In PPPs, firms are required to coordinate with a large and diverse set of
stakeholders, who hold significant stakes in the project and come from many different
domains. To enable this coordination, the mechanisms used should facilitate and ease
communication among the various project stakeholders. For instance, both the financial
institutions that lend money to the project, and the consultants who monitor the project
on the behalf of the government, require transparent access to complete project information. At the same time, the SPV needs to maintain transparency in its actions as it temporarily possess monopolistic rights over a public infrastructure, and the public needs to be continuously assured that the monopolistic rights it holds are not being misused.

The use of HSBOs as coordination mechanisms not only brings transparency in working, but their real world manifestations, like project schedules, meeting logs, issue registers, etc., are very valuable in creating a permanent trail of work. Hence, to work in a transparent way and to create a trail of the work, firms with a focus on the PPP way of working lay a higher emphasis on the use of HSBOs for coordination.

In contrast, when the construction firm has less focus on PPP projects, it is primarily involved in construction projects as a contractor, and its actions are guided by its prior experience. In such projects the client shoulders the majority of the project risks, and only the construction risks like design fault risks, cost and schedule over-run risks, and project completion risks are delegated to the contractor. As the construction firm is not exposed to risks arising from the activities of other project stakeholders, the need for trail leaving coordination mechanisms does not exist. Also, in such projects the construction firm gets involved with the daily operating activities in the project and solely enjoys the returns from efficiency gains; consequently it possess both the incentive and the ability to keep its working practices (i.e., its own developed set of HSBOs) private to itself as a source of sustainable competitive advantage. This makes the firm de-emphasize the use of coordination mechanisms that would leave a trail behind (i.e., HSBOs), and which would increase transparency with others. Moreover, in the interest
of protecting the firm’s competitive advantage in construction activities, the use of transparency inducing mechanisms would be discouraged.

Hypothesis 2a: The relationship between the firm’s focus on the PPP form and the emphasis it places on the use of HSBOs for coordination with other agencies in carrying out work in the project, is positive.

**Firm’s PPP focus and use of common ground for coordination**

The bundling of risks in and the long-term nature of PPP projects, requires firms working such projects to develop a long-term commitment to it (Fulghieri & Sevilir, 2009). Consequently, despite the need of a significant amount of effort and time on the part of the firm to develop common ground in the PPP project, common ground is viewed as a source of continued positive returns for the firm over the life of the project. A firm which has worked PPP projects previously, is not only inclined to develop common ground in the project, but would also understand how, when, and where to make time and effort investments to build common ground.

The long-term nature of PPP projects exposes the project to macroeconomic and financial market movements. How such movements would affect the project cannot be fully envisaged ex-ante and addressed in the concession agreements, exposing the construction firm to them and their associated risks, and increase the interdependence among the project agencies. As higher task interdependence can be better managed by the use of spontaneous mechanisms of coordination (Thompson, 1967), and the use of these mechanisms requires the presence of a common ground between the agencies, a firm with a high PPP focus is more likely to emphasize the use of common ground for coordination.

In contrast, when a firm is less focused on PPP projects, it is guided in its actions by the generic practices of the construction industry, wherein the firm primarily deals
with short-term arms length contracts, like outsourcing contracts. Typically, investments in time and resources to build and sustain common ground within the project are relatively less important in outsourcing contracts, in comparison to long term agreements like PPP contracts.\(^3\)

Furthermore, due to the involvement of the construction firm with different forms of organizing work, the commitment of the firm headquarters to the way of organizing work in the context of the focal project gets diluted (Fulghieri & Sevilir, 2009). This dilution reduces the corporate priority placed on the coordination of the work in the focal project, and hence the availability of resources for development of common ground in the project gets constrained. For example, to develop a common ground at the project level, a significant amount of social interaction would be required at both the project and the corporate levels. While social interactions at the project level are spontaneous and exist on account of localization of coordination at the SPV level, social interactions at the corporate level have to be deliberately invoked. However, social interaction at the corporate level suffers, as the corporate managers of such firms are less likely to participate in the project’s interactions, due to their lack of understanding of the unique PPP context, dilution of commitment to the focal PPP project, and competing requirements of managerial attention from the other lines of business.

Hypothesis 2b: The relationship between the firm’s focus on the PPP form and the emphasis it places on the use of common ground for coordination with other agencies in carrying out work in the project, is positive.

\(^3\) It is argued that a difference exists between a firm’s willingness to invest in common ground when the contracts are short, but possess both a shadow of the future and a shadow of the past, and a firm’s willingness to invest in common ground when the firm has long-term contracts. This is in line with the suggestions of Puranam & Vanneste (2009) and Poppo, Zhou, & Ryu (2008) to disentangle the effects of ex-ante trust and ex-post trust.
Manager’s Experience and Coordination

The strategic leadership literature finds that the manager’s experience determines the strategic choices that he makes on behalf of the firm, and hence molds the firm’s working (Finkelstein, Hambrick, & Cannella, 2008). The literature further finds that the experience of managers in diverse domains differently molds the manager’s choices. For instance, managers with high international experience have been found to enable firms to enter new foreign markets, since they possess a broader understanding of the global marketplace (Chen & Stucker, 1997). Managers with high experience in position (i.e., tenure) have been found to bring strategic rigidity to the firm’s actions, as they tend to follow discernible patterns over time and commit the firm to its status quo (Henderson, Miller, & Hambrick, 2006). Similarly, as the industry experience of a manager inserts him into a social setting, wherein the actions, contexts, and outcomes are subject to shared interpretations with others in the industry, the manager takes actions which display his commitment to the industry’s practices (Burrell, Morgan, & Morgan, 1979; Hambrick, Geletkanycz, & Fredrickson, 1993).

In the context of this study, three kinds of manager’s experience are relevant. And, these are, i) the manager’s experience with the technical domain (highways in our case), ii) the manager’s experience with the organizational domain (PPP way of working), and iii) the manager’s experience with his parent firm (manager’s firm tenure). As these distinct kinds of experience lie at different layers of the social system (i.e., industry, organizational form, and firm), they embed the manager in his work context to different extents and in different ways, such that they have independent effects on the manager’s behavior (Finkelstein, Hambrick, & Cannella, 2008). For example, experience in the highway sector makes the manager rely on industry conventions and industry-specific
bodies of knowledge (Finkelstein, Hambrick, & Cannella, 2008), inserts him/her into the industry’s social settings so as to share perceptions with other managers in the industry (Burrell, Morgan, & Morgan, 1979), and molds his/her social construction of reality specific to the highway industry (Hambrick, Geletkanycz, & Fredrickson, 1993). Similarly, managers possessing experience with the PPP working are exposed to the unique aspects of PPP projects, which have been identified earlier as governance based on public contracts, involvement with public infrastructures, dealing with public agencies, and handling a large bundle of risks with a long term focus. Likewise, tenure with the parent firm affects the manager’s cognitions (Katz, 1982), makes him follow a discernible pattern over time (Finkelstein, Hambrick, & Cannella, 2009), brings him more autonomy and power (Miller, 1991), makes him the master of his work (Hambrick & Fukutomi, 1991), affects the sources of his information, and makes him develop a commitment to the firm’s paradigm (Miller, 1991).

**Manager’s Experience and Use of Boundary Objects for Coordination**

While the firm’s experience determines the set of industry practices available for carrying out coordination in the project, it is the manager at the helm who has to implement them. As this implementation requires that these practices be transferred from the firm to the project’s context, the manager is required to select the boundary objects for use, adapt them to the new context, and finally decide the extent to which they are made use of in work (Howard-Grenville, 2005). However, this transfer of practice is not likely to be easy, as practices of work are sticky (Szulanski, 1996). This stickiness comes from the characteristics of the sourcing context from whence the practices are borrowed, the characteristics of the receiving context where the practices are deployed, and also from the inherent ambiguity of the extent to which the practice is
likely to be relevant in the new setting (Szulanski, 1996). The manager’s experience plays an important role in how the manager tackles this stickiness of these practices, and molds the choice he makes in transferring the practices from the firm to the project context.

As individuals approach boundary objects with different intentions and orientations (Edmondson, Bohmer, & Pisano, 2001; Howard-Grenville, 2005), we expect the manager’s experience to mold his intentions and orientations, and affect the emphasis placed on using boundary objects for coordinating work.

Manager’s highway experience and use of boundary objects

While the firm’s highway focus makes available a set of highway sector specific boundary objects for use in the project, the manager’s highway experience enables him to better understand their use, be more aware of the ways in which they can be adapted for use, and to possess a superior judgment of their usefulness to the project. Also, as the highway experience of the manager exposes him to industry conventions and industry-specific bodies of knowledge, he becomes adept in using the industry’s meta-routines to deploy industry-specific practices (Finkelstein, Hambrick, & Cannella, 2008). This makes the manager supplement the effects of the firm’s focus on the use of boundary objects for coordination, and hence strengthen the primary relationship between the firm’s focus and use of HSBOs.

On the other hand, a manager with less experience in the highway sector does not fully appreciate the use of industry-specific boundary objects (which have been made available by the firm’s highway focus), as he does not fully understand the unique aspects of the highway sector. In other words, the manager lacks a complete understanding of how the highway specific boundary objects made available by the firm
address the large number of uncertainties associated with highway projects, increase the efficiency of working, and negotiate the legitimacy and institutional pressures while working with highly specialized highway agencies. Accordingly, a manager with low highway experience is unable to supplement the firm’s positive effects.

Hence, we expect the positive link between the firm’s highway focus and use of boundary objects for coordination to be positively moderated by the manager’s highway experience, as the manager is more comfortable in deploying the highway specific boundary objects, made unambiguously available by the firm, on account of the firm’s higher focus on the highway sector.

Hypothesis 3a: The positive relationship between the firm’s focus on the highway sector, and the emphasis it places on the use of HSBOs for coordination with other agencies in carrying out work, will become stronger with an increase in the manager’s highway experience.

PPP projects are a relatively recent phenomenon for the Indian highway industry. Hence, managers with more highway experience have primarily earned their experience while working in non-PPP projects, which are governed by arms length contracts. Such managers are unlikely to fully appreciate the need for transparency in a firm’s activities or the use of coordination mechanisms that leave a trail behind, which are essential for working in PPP projects. This lack of appreciation on the part of the manager primarily comes from the larger share of his/her experience in working arms length contracts with public agencies, wherein the parent firm’s risk exposures are limited and the firm can pocket all efficiency gains from the project.

While coordinating PPP projects, the PPP focus of the firm makes available a set of transparency bringing and trail leaving boundary objects for use, whereas the

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4 In our sample the average PPP experience of managers is 4.54 years, whereas the average highway experience of managers is 12.60 years.
manager with more highway experience sees their usage as unproductive and harmful to the firm’s interests. Accordingly, on account of *contradictory* assumptions, while the firm with increased PPP focus creates more and more HSBOs for use in the project, the manager finds them to be unsuitable for use in the project. More specifically, the manager avoids the use of transparency bringing mechanisms, and even while deploying firm-emphasized HSBOs strips them of their transparency aspects. On the other hand, a manager with less highway experience is unlikely to see the use of boundary objects in PPP projects as harmful to the firm’s interests, and so will continue to emphasize their usage in the project as stipulated by the firm’s policies.

Hence, the manager’s greater highway experience weakens the positive effects of the firm’s PPP focus on the use of boundary objects as a coordination mechanism.

Hypothesis 3b: The positive relationship between the firm’s focus on the PPP form, and the emphasis it places on the use of HSBOs for coordination with other agencies in carrying out work, will become weaker with an increase in the manager’s highway experience.

**Manager’s PPP experience and use of boundary objects**

A manager with greater PPP experience is exposed to the unique aspects of PPP projects, and understands the need for using transparency and trail-leaving objects in coordinating them. While a firm with a large highway focus does not recognize these unique aspects, it does possess a set of highway specific boundary objects (HSBOs), which it uses when dealing with the government in arms length contracts. Hence, while the firm emphasizes the use of these boundary objects to achieve efficiency through specialization, the manager with PPP experience *complements* these affects with different intentions and orientations. The manager with a more PPP experience sees
them as mechanisms that increase transparency and leave work trails, which as per his experience are important for coordinating PPP projects.

Further, the high PPP experience of the manager makes him better equipped to choose the most appropriate boundary objects for use in the project out of the firm’s unambiguous repository of highway specific practices. In effect, the manager compensates the firm’s inadequacy in understanding the uniqueness of PPP projects and molds the firm’s use of boundary objects such that those used enable better documentation of the project, bring higher transparency, and leave reliable trials behind. Hence, we can expect a manager with a extensive PPP experience to increase the emphasis placed on the use of HSBOs, which have been unambiguously made available by the firm’s highway focus, for coordinating in the project.

Hypothesis 4a: The positive relationship between the firm’s focus on highway sector, and the emphasis it places on the use of HSBOs for coordination with other agencies in carrying out work, will become stronger with an increase in the manager’s PPP experience.

When a manager with greater PPP experience works for a firm with a high PPP focus, both the manager and the firm’s understanding of the unique aspects of PPP project working are similar and complement each others, such that each emphasizes the other in the use of boundary objects. That is, while the firm with a PPP focus calls attention to the use of transparency bringing, trail leaving, and communication enabling HSBOs, the manager recognizes these unique roles of HSBOs and emphasizes their use for coordination of work. And we can expect the emphasis and underscoring of the use of HSBOs by the manager to increase as the manager gains experience with the PPP form.

Hypothesis 4b: The positive relationship between the firm’s focus on the PPP form, and the emphasis it places on the use of HSBOs for coordination
with other agencies in carrying out work, will become stronger with an increase in the manager’s PPP experience.

Manager’s firm tenure and use of boundary objects

A manager’s tenure with the firm commits him to the status quo of the firm, bringing strategic rigidity to actions he takes on its behalf (Henderson, Miller, & Hambrick, 2006), hence a manager’s firm tenure can be expected to reinforce the firm’s dominant paradigm. More specifically, when a manager has a high tenure with a firm that has a high focus on the highway sector, the manager enhances the positive effects of the firm’s focus on the use of HSBOs for coordination, recognizing that their use brings about efficiency from specialization. Such a manager is well versed with the firm’s way of working, identifies with the firm, and also better understands the firm’s choice of boundary objects to use. On the other hand, managers with low firm tenure are less exposed to the firm’s usage of boundary objects and would be uncomfortable in deploying the firm’s sector-specific routines, such that the complementing effects would not exist.

Hypothesis 5a: The positive relationship between the firm’s focus on the highway sector, and the emphasis it places on the use of HSBOs for coordination with other agencies in carrying out work, will become stronger with an increase in the manager’s firm tenure.

A manager working for a firm with a high PPP focus views the firm’s emphasis on the use of boundary objects as bringing about transparency with the other project agencies. However, if the manager has a high tenure with the firm, he finds it to be an undesirable situation. In PPP projects the firm takes up most of the project risks, makes significant front end investments, and is committed to the project over its long concession period, hence the need for transparency with other project agencies seems unwarranted to a manager who identifies with the firm on account of his high tenure.
Hence, the manager with a high firm tenure is uncomfortable in sharing complete project information and laying out his cards in the open, where even the competitors are likely to see them. Accordingly, such a manager would work to reduce the emphasis that the firm places on the use of boundary objects for coordination.

On the other hand, a manager with low firm tenure is unlikely to possess such commitments to the firm, and will instead follow the firm’s mandate of using boundary objects for work in the project, boosting the already positive effects.

Hypothesis 5b: The positive relationship between the firm’s focus on the PPP form, and the emphasis it places on the use of HSBOs for coordination with other agencies in carrying out work, will become weaker with an increase in the manager’s firm tenure.

Manager’s Experience and Use of Common Ground for Coordination

Different kinds of manager experience embed the manager in different layers of the social system (i.e., industry level, organizational form level, and firm level). This embeddedness differently molds his intentions and orientations and consequently affects the actions he takes (Feldman & Pentland, 2003; Howard-Grenville, 2005; Sewell, 1992; Zaheer, McEvily & Perrone, 1998). Hence, it is expected that the earlier hypothesized relationships between the firm’s focus of experience and the use of common ground for coordinating work would be moderated differently by the different kinds of experience that the manager possesses.

Manager’s highway experience and use of common ground

The manager’s experience in the highway sector inserts him in the industry’s social setting. This molds the manager’s social construction of reality to the industry’s social setting, wherein he shares his perceptions with other managers in the industry (Burrell, Morgan, & Morgan, 1979; Hambrick, Geletkanycz, & Fredrickson, 1993).
Further, working for an extended time in a specific sector allows the manager to develop an extensive set of professional contacts and a network of social relationships in the sector. As a result, the manager possesses a shared understanding and common ground with other managers in the sector.

The recognition of the unique aspects of public contracts and also the differences between the private firms and public agencies makes the firm with a highway focus reduce its efforts to cultivate and use common ground for coordination. However, a manager with extensive highway experience brings in the valuable resource of social capital (i.e., shared understanding, common knowledge, and common perceptions with other sector managers), for use by the firm in the project. Hence, while operationalizing the firm’s intentions while working on the project, the manager gets guided by both the requirement at the firm level to make investments to develop common ground, and also the social capital that he possesses and brings with him. More specifically, the creation of common ground requires the capabilities to create common ground and purposive investments, and while the firm’s highway focus reduces the intention to make investments, the manager’s social capital brings in the capabilities to build common ground. Accordingly, the negative effects of a firm’s highway focus on the emphasis of common ground is likely to be weakened by the presence of a manager with more experience in the highway sector.

On the other hand, a manager with less highway experience is unable to bring this social capital to the project, and is primarily guided by the firm’s intentions of reducing investments in the creation or use of common ground at the project level. Hence, such a
manager would not only not be able to *compensate* for the firm’s intentions, but would also amplify the firm’s effects, being primarily guided by the firm’s intentions.

Hypothesis 6a: The negative relationship between the firm’s focus on the highway sector, and the emphasis it places on the use of common ground for coordination with other agencies in carrying out work, will become weaker with an increase in the manager’s highway experience.

A firm with high PPP focus understands the importance of common ground in the project, and also how common ground would enable it to negotiate the uncertainties and risks that characterize long-term PPP projects. This causes the firm to emphasize the use of common ground and work to create it. In contrast to the earlier case, the manager’s shared understanding and common ground with other industry managers complements the firm’s intentions, such that the manager’s highway experience amplifies the already positive effects of the firm’s PPP focus. A manager with less highway experience does not possess the required social capital of personal contacts; he is not in a position to complement the positive effects of the firm’s PPP focus.

Hypothesis 6b: The positive relationship between the firm’s focus on the PPP form, and the emphasis it places on the use of common ground for coordination with other agencies in carrying out work, will become stronger with an increase in the manager’s highway experience.

**Manager’s PPP experience and use of common ground**

The manager’s PPP experience enables him to understand the unique aspects of PPP working. More specifically, the manager recognizes that while being located outside of the firm’s boundaries in the SPV, he is required to manage the project in the presence of significant macroeconomic risks, while maintaining a long-term orientation. This humbles the managers, who recognize that it would be easier to negotiate the unforeseen situations arising out of environmental uncertainty with the active participation of everyone in the project, and hence makes them see the benefits of
common ground (Krishna, Martin, and Noorderhaven, 2006). Similar to the previous argument for Hypothesis 6a, such a manager compensates for the highway-focused firm’s lack of intentions to invest in building of common ground, and the manager actively attempts to build common ground and weaken the negative effects of the firm’s highway focus on the emphasis of common ground for coordination.

Hypothesis 7a: The negative relationship between the firm’s focus on the highway sector, and the emphasis it places on the use of common ground for coordination with other agencies in carrying out work, will become weaker with an increase in the manager’s PPP experience.

The firm’s focus and the manager’s experience in the domain of PPPs, complement the effects of one another. While the firm brings in a clear set of intentions and the recognition that the use of common ground at the project level is necessary to negotiate project risks, the manager contributes by better understanding the intentions of the firm, working towards achieving those intentions, and also supplementing the firm’s intentions with his expertise in managing PPP project risks.

Hypothesis 7b: The positive relationship between the firm’s focus on PPP form and the emphasis it places on the use of common ground for coordination with other agencies in carrying out work, will become stronger with an increase in the manager’s PPP experience.

**Manager’s firm tenure and use of common ground**

A manager’s firm tenure uniquely locates him in the social system at the firm level, affecting his cognitions (Katz, 1982). Firm tenure makes the manager identify with the firm’s way of working and its paradigms (Miller, 1991; Finkelstein, Hambrick, & Cannella, 2009). Also, the manager’s long tenure with the same firm affects his sources of information, primarily relying on the intra-firm personnel networks for information (Miller, 1991). Accordingly, a manager with long tenure with a firm having a highway focus is only exposed to the firm-specific ways of working highway projects, the firm’s paradigms
on managing such projects, and the intra-firm networks that only provide information about highway working. This makes the manager a reflection of the firm, and the manager has capabilities very similar to those of the firm (Kanter, 1977). Hence, an increase in the manager’s firm tenure causes him/her to complement the negative effects of the firm’s highway focus on the use of common ground, and makes these negative effects stronger.

Hypothesis 8a: The negative relationship between the firm’s focus on the highway sector, and the emphasis it places on the use of common ground for coordination with other agencies in carrying out work, will become stronger with an increase in the manager’s firm tenure.

The PPP mode of delivery for infrastructure projects is only a decade old in the Indian highway industry and has gained importance in the last five years. Hence, recognition of the unique aspects of PPPs, such as the bundling of risks and need for long-term focus, has only now started to emerge. Accordingly, a longer firm tenure of the manager at the firm not only implies that the manager has been witness to changes as the firm has adapted itself to the PPP mode, but also that the manager is likely to have been a part of this adaptation. As a result, the manager better understands the firm’s new paradigms of working and complement the firm’s effects. Given that one of the primary aspects of the PPP way of working is the recognition of the role of common ground in managing PPP project risks, and consequently the firm’s investments in building common ground in the project, the manager’s firm tenure complements and boosts the positive effects of the firm’s PPP focus on the use of common ground for coordination.

Hypothesis 8b: The positive relationship between the firm’s focus on the PPP form, and the emphasis it places on the use of common ground for coordination with other agencies in carrying out work, will become stronger with an increase in the manager’s firm tenure.
Figure 4-1. Proposed model to study the effect of firm and managers experience on the emphasis placed on mechanisms of coordination.
Table 4-1. Summary of hypothesis

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<th>Moderation</th>
<th>Hypothesized Effects</th>
<th>Argued rationale</th>
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<td></td>
<td></td>
<td></td>
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<td>Firm’s focus on highway sector</td>
<td>(+)*</td>
<td></td>
<td>Lack of ambiguity about use of practices</td>
</tr>
<tr>
<td>3a</td>
<td>Manager’s highway</td>
<td>(+)</td>
<td>Strengthen</td>
<td>Knows practices well</td>
</tr>
<tr>
<td>4a</td>
<td>Manager’s PPP experience</td>
<td>(+)*</td>
<td>Strengthen</td>
<td>Better select the appropriate practices for use</td>
</tr>
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<td>(+)</td>
<td>Strengthen</td>
<td>Entrenched in the firm’s way of working</td>
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<tr>
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<td>(+)</td>
<td></td>
<td>Transparency &amp; fairness requirements to manage distinct aspects of PPP projects</td>
</tr>
<tr>
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<td>Weaken</td>
<td>Lack of understanding PPP context</td>
</tr>
<tr>
<td>4b</td>
<td>Manager’s PPP experience</td>
<td>(+)</td>
<td>Strengthen</td>
<td>Recognition of risk bundling in PPPs</td>
</tr>
<tr>
<td>5b</td>
<td>Manager’s firm tenure</td>
<td>(-)</td>
<td>Weaken</td>
<td>Protect firm’s advantages</td>
</tr>
<tr>
<td></td>
<td><strong>Hypotheses about emphasis on common ground</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1b</td>
<td>Firm’s focus on highway sector</td>
<td>(-)</td>
<td></td>
<td>Completeness of arms length contracts, distinctiveness of government, public contracts</td>
</tr>
<tr>
<td>6a</td>
<td>Manager’s highway</td>
<td>(+)</td>
<td>Weaken</td>
<td>Readily available individual social capital</td>
</tr>
<tr>
<td>7a</td>
<td>Manager’s PPP experience</td>
<td>(+)*</td>
<td>Weaken</td>
<td>Recognition of PPP requirements</td>
</tr>
<tr>
<td>8a</td>
<td>Manager’s firm tenure</td>
<td>(-)</td>
<td>Strengthen</td>
<td>Identification with firm’s paradigm</td>
</tr>
<tr>
<td>2b</td>
<td>Firm’s focus on PPP working</td>
<td>(+)</td>
<td></td>
<td>To manage external uncertainties of the project, long term nature of PPPs</td>
</tr>
<tr>
<td>6b</td>
<td>Manager’s highway</td>
<td>(+)</td>
<td>Strengthen</td>
<td>Readily available individual social capital</td>
</tr>
<tr>
<td>7b</td>
<td>Manager’s PPP experience</td>
<td>(+)</td>
<td>Strengthen</td>
<td>Recognition of PPP requirements</td>
</tr>
<tr>
<td>8b</td>
<td>Manager’s firm tenure</td>
<td>(+) - (-)*</td>
<td></td>
<td>Part of firm’s changing paradigms</td>
</tr>
</tbody>
</table>

Note: The hypotheses found significant in the empirical results have been starred and the sign found indicated above.
CHAPTER 5
METHODS AND ANALYSIS

The unit of analysis for the study lies at the individual project level, and the sample universe of projects is comprised of the 179 Indian highway projects in the construction phase that are being constructed through the PPP mode. These projects are a significant and important driver of India’s economic growth; hence this chapter starts with an overview of this context, and highlights the important role of highway construction in India’s growth. It also provides evidence of the increasing private investments in this sector through the PPP mode of project execution.

The data collection for the study faced some unique challenges in preparation of the survey questionnaire, in specification of the sample universe of projects to be targeted for data collection, and in administration of the survey. These unique challenges are discussed in the chapter, after the overview of the empirical context of the study.

The variables studied were measured using multiple methods. While the survey questionnaire provided measures of how coordination is carried out in the projects, the experience profiles of the responsible project managers was collected by directly contacting them. Further, variables of a firm’s experience were constructed from data shared on a government website. The last part of the chapter reports on the discriminant validity of the different measures coming from the survey, after a detailed description of the operationalization and measurement of the variables used in the study.
Empirical Context of the Study

Infrastructure is important for growth, and more so for countries wanting to achieve fast-paced development (Estache & Fay, 2007). India has set itself a target of 9% annual economic growth for the next five years, and to achieve this growth it envisions doubling its investments in the infrastructure sector. To illustrate, investments in Indian infrastructure are expected to double from 500 billion USD between 2007-2012 to about 1 trillion USD between 2012-2017. Furthermore, a large percentage of this infrastructure investment will be made in the highway sector, and about a third of this investment will be made by the private sector (Press Information Bureau of India, 2011). Most of this private sector investment will come in the form of equity or debt capital in PPP highway projects, which are the context of this study.

Highway Construction in India

Infrastructure is an umbrella term, and there is a lack of agreement among policy makers on what constitutes infrastructure. However, in India’s case a consensus exists, and the highway sector is unanimously viewed as a key infrastructure sector, being the second largest infrastructure sector next to power generation, and a growing one (http://infrastructure.gov.in). In absolute terms the investments made in the highway sector in India were 144,892 crore Indian rupees (about 31.5 billion USD) between 2002-2007, and are expected to more than double, reaching 314,152 crore Indian rupees (about 69 billion USD) between 2007-2012. In terms of percentages, while 16.63% of the total infrastructure investment in the country was made on roads and bridges during the period of 2002-2007, 15.28% of the total infrastructure investment is
expected to flow to this sector during the period of 2007-2012 (Planning Commission, Government of India, 2008). The continued growth of the sector is also evident from the fact that while the sector was upgrading 5 km of road per day in 2002-2007, it has upgraded 11 km of road per day in 2010-2011, and is building a capacity to upgrade 20 km of road per day (Dash, D.K., 2011 October 17).

At the national level, the National Highway Authority of India (NHAI) handles road development. This authority was formed in February 1995, after the operationalization of the National Highways Authority of India Act of 1988. This authority is responsible for the development, maintenance, and management of all national highways, that is, those that are under the direct management of the central government. Since its inception, this authority has completed over 200 highway projects, and as of September 1, 2010 it was executing another 230 highway projects.

While upgrading, construction, and maintenance of national highways has been entrusted to NHAI, state governments are responsible for these activities at the state level. Recognizing the importance of roads and highways for the state’s economic development, many states have also started their own highway improvement programs. These state-level programs are executed by state-level road authorities, which have been formed with mandates similar to the one of NHAI. As of September 1, 2010, another 200 road upgrade projects are under execution at the state level; however, these projects are invariably smaller in size than the national level projects.
While the Indian highway sector has been witnessing phenomenal growth, time and cost over-runs plague the Indian highway construction sector, and in October 2010, 143 highway projects in India were identified as facing severe project delivery issues (Dash, D.K., 2010 October 10). Here, project delivery refers to the output of the construction phase of the project. While few studies of the Indian highway sector exist, previous reports on the construction industry in India have found that the industry is prone to such problems, and these problems are not new to the highway sector (Dash, D.K., 2010 October 10; Bandyopadhyay, Swaminathan, & Rohatgi, 2008).

In an attempt to identify the key determinants of project success, Jha & Iyer (2006; 2007) surveyed managers of the Indian construction industry in two stages. In the first stage of their study, they found the primary determinants of construction project success to be coordination between the project agencies, and the commitment and competence of the managers. In the second stage of their study, they found these determinants of project performance to be differently associated with the four primary facets of a construction project’s performance: timely delivery, quality of output, safety of the project, and completion within financial budgets (Duncan, 2003).

**Private Participation in Indian Highway Sector**

India has a vast network of about 3.3 million km public roads, the second largest in the world after the road network of the United States of America. Whereas traditionally roads have been constructed, managed, and operated by the government, in the last few decades the private sector has been playing an increasing role in both highway construction and operation in India. Not only has
construction activity moved from the public to the private sector, but the private sector has also been investing in highways, with the emergence of PPP as a viable and attractive option for the development of transport infrastructures with private participation (Bult-Spiering & Dewulf, 2006; Davidson, 2010). While about 5% of the investment in roads and bridges came from the private sector during the five-year period of 2002-2007, (i.e., 7004 crore Indian rupees or about 1.5 billion USD), it is expected that almost 34% of the total investment in the sector will come from the private sector between 2007-2012 (i.e., 106792 crore Indian rupees or about 23.5 billion USD).

With an increase in the use of PPPs for infrastructure provisioning, many different kinds of PPPs have emerged. As PPPs involve the sharing of risks and responsibilities between the government and the private firm, different kinds of PPPs reflect the degree to which the private firms take over the risks from the government. For instance, in PPPs structured as BOT (Build, Operate, & Transfer), the private firm only assumes the risks of construction and operating the infrastructure, while in PPPs structured as DBOLT (Design, Build, Operate, Lease, & Transfer) the private firm also assumes design and leasing risks associated with the infrastructure (Boeing Singh & Kalidindi, 2006; Delmon, 2010). While the Indian government has been experimenting with these different kinds of PPPs, the highway sector has been predominantly using the BOFT (Build, Operate, Finance, and Transfer) kind of PPP, and is now moving towards DBOFT, in which the design responsibilities are attributed to the private firms (India Infrastructure Research, 2010).
Highway projects differ in their traffic projections, and whereas some are expected to be lucrative with respect to toll revenues, others are unlikely to breakeven based on toll revenues. These project differences manifest as differences in how the government positively or negatively compensates the private firm, and PPP highway projects get categorized as toll based, positive grant, or negative grant. PPP projects in which the up-front investments and projected returns are balanced get categorized as toll based projects. Herein the private firm upgrades the highway, operates it, and collects the toll revenues for the contracted period to compensate itself for the initial investments. For projects in which the projected toll collections fall short of the initially required financial investments, the government is required to compensate the private firms for undertaking the project. This compensation by the government comes in the form of viability gap funding (VGF), and such projects get categorized as negative grant projects. In contrast, if the projected toll collections from the project exceed the investments required of the private firm, the firm is required to compensate the government by sharing the toll revenues or giving a lump sum amount to the government at the start of the project, making these positive grant projects. At the same time, if these negative or positive grants are provided in lump sum at the start of the project, the projects are categorized as grant projects. In contrast, if these grants are made on an annual or biannual basis, the projects are categorized as annuity projects. The Indian highway sector uses all of these different kinds of PPP projects.
Data Collection

Sample Universe of Projects

The universe of projects for this study consists of all highway PPP projects in India at the national and state levels that are in the construction stage. To construct this sample universe we compiled a list of highway PPP projects that had been undertaken in India as of Sept 2010, being guided by the online database of PPP projects in India maintained by Ministry of Finance, Government of India (i.e., www.pppindia.nic.in). 376 of the 703 PPP projects in this database are highway upgradation projects.

While some of the projects on this list of 376 had been completed, others were in different stages of execution, and some had not even started. To maintain homogeneity in the sample of projects studied, it was decided to only study projects that were in various stages of construction. The construction stage is the most important stage of an infrastructure upgradation projects and coordination is of prime importance during this stage (Iyer & Jha, 2005; 2006). In particular, it is during this stage that coordination challenges continuously emerge, and the different project participants need to interact frequently to handle them (Boeing Singh & Kalidindi, 2006; Delmon, 2010). Therefore, the next step in the creation of the sample universe for study involved identification of projects at the construction stage. As both the beginning and the end of the construction stage can be ambiguous (Duncan, 2003), a clear logic was required to establish a cut-in and cut-out date for including projects in the sample universe.

The signing date of the concession agreement was chosen as the cut-in date for a project to be included in the study sample. This choice made the
inclusion criterion for the projects unambiguous, as the signing date of the concession agreement is sacrosanct, has legal validation, and is widely known. In the context studied, the private firm awarded the project by the government is allowed six months to achieve financial closure, and the concession agreement is signed only when financial closure has been achieved. Hence, with the knowledge that the firm will need to soon begin construction work, the firm initiates resource mobilization for the project, creates the SPV for the PPPs working, and starts project planning long before the actual signing of the concession agreement, but no physical work begins until the agreement is signed. Hence, full-fledged coordination in the project can be expected to start with the signing of the concession agreement.

The cut-off date for project inclusion was set as one year from the date of commercial operation. As in the case of the concession agreement date, this date is unambiguous and widely known, as it signifies the end of the defect liability period of the project. The defect liability period is an essential part of the construction stage, and during this period the managers of the different project agencies continue to interact and finish the leftover work in the project. While the intensity of interactions between the project managers fades out as time elapses after the start of commercial operation, we can expect the use of the same coordination mechanism during this period that were established during the construction phase. Further, as the managers are still handling the same project, we do not expect them to bring in any retrospective bias, which would have come
in if too large a time would have appeared if too great a time had been allowed to elapse between the event and research observation (Hinkin, 1998).

With the establishment of these cut-in and cut-off dates, the reduced sample of projects consists of PPP highway projects in India (both at the central government and state government levels) that were at any stage between financial closure and one year past the date of commercial operation as of September 1, 2010. Of the 376 PPP highway and road projects identified earlier, 179 were identified to be in the construction stage, with 126 at the national level and 53 at the state level.

**Preparation of the Survey Questionnaire**

The managers who coordinate the work in a project are the best source of information about the mechanisms of coordination used in the project. Hence, a survey questionnaire was used to measure the emphasis that managers placed on the use of different mechanisms of coordination (i.e., use of boundary objects and common ground).

The PPP context is very unique, and no prior studies could be identified that had sought to examine coordination in this context, forcing us to create our own survey questionnaire for use in the study. The recommendations made by Hinkin (1998) directed the steps that we took for preparing the survey questionnaire.

The literature studying coordination in alliances and in organizations guided our identification of the survey items to be used in the questionnaire. For this, prior studies were surveyed and a comprehensive list of survey items that measured coordination was compiled. The items in this list were then analyzed to identify the mechanisms of coordination that they measured. This identification
led to the categorization of the items into the three distinct dimensions (i.e., structuring of work, use of boundary objects, and use of common ground). This theoretical exercise led to a preliminary list of survey items to be used in the survey questionnaire.

After ensuring that the survey items captured all of the different aspects of work in which coordination needs to be carried out, these items were written out and the first draft of the survey questionnaire prepared. To validate this draft questionnaire, and to ensure that it had theoretical validity in measuring the proposed constructs, fellow graduate students were requested to comment on the dimensions of coordination that the questions sought to capture, and their responses were used to reword the questions, as necessary.

With this preliminary validation, the questions were next contextualized to the construction industry, and more specifically to the Indian highway construction industry and the working of PPPs. This contextualization led to significant changes in the wording of the questions. For instance, to bring clarity in the questions, the use of theoretical constructs was substituted with their nearest equivalents used in the context. That is, the “use of structuring” was substituted with “contract,” as PPPs are primarily structured by contracts; the “use of boundary objects” was substituted with “planning/scheduling,” as planning and scheduling are the primary ways in which boundary objects are used in highway construction; and the “use of common ground” was substituted with “reliance on social relations.” Further, to clarify the item’s meaning in the construction context, examples were provided. For instance, while asking the
respondents whether the planning and scheduling was agreed to by the different agencies, an example was provided which explained the survey item as “agreeing to the detailed method construction.” The contextualization was necessary as the earlier identified mechanisms of coordination are theoretical constructs, and their usage in the instrument would have been a source of ambiguity to managers in the field.

To ensure that the contextualized items in the questionnaire were clear, unambiguous, cognitively easy to answer, and addressed the objectives of the research, industry professionals and academicians from a wide range of disciplines were requested to comment on them (Hinkin, 1998). Some of those who obliged to our request were: management faculty and graduate students who have significant experience in implementing organizational behavior surveys; two post-doctoral fellows, one each from India and Portugal, who had experience in both the industry and academics, and had previously administered surveys for their research; PhD candidates in the area of construction management; academicians in India with a specialization in construction management, and who had previously surveyed managers in the Indian construction industry; and Indian highway industry experts. Their suggestions and recommendations were accommodated in the final revised draft of the questionnaire administered, which is included as an appendix.

**Administration of the Survey**

With both the survey questionnaire and the universe of projects to be sampled ready, the next step involved identification of the survey subjects: the key managers responsible for executing these projects, and who had knowledge
of how the project was being coordinated. For this, a two-pronged approach was adopted. First, the corporate offices of the construction and consulting firms involved with PPP projects in India were contacted. After briefing the corporate officers of the nature of the study, they were requested to share the contact details of managers working at the project level. Secondly, the field level officers of NHAI and the state highway authorities (PD) were contacted. They were not only requested to fill out the survey questionnaire for the projects in their jurisdiction, but to also provide contact details of the private firm’s manager (PM) and consultant’s team leader working on the project (IC). Based on the contacts obtained, a snowballing method was adopted to identify other managers who could possibly be contacted to fill out the survey questionnaire.

A survey of field managers is a difficult task, as managers have to take time from their fieldwork to fill out the survey questionnaire, and they also need to come out of their work domains and daily routines to read, understand, and respond to the survey items. In the Indian construction industry, this task becomes even more difficult as the industry is recognized for its lack of emphasis on structured data analysis and use of systematic tools (Mahalingam, 2005). Further, these managers, who are invariably engineers, are not accustomed to answering survey questions or filling out survey questionnaires, and question the survey methodology of data collection (Jha & Iyer, 2006a, b). To add to this, the sector has recently witnessed a number of political and ethical controversies, including corruption allegations at various levels. This made managers reluctant to participate in the study, or to willingly part with project information, as they
were unclear on how the information provided by them would be used, and feared that the information provided may be shared with the press, vigilance, audit, or with their competitors, to their personal disadvantage. Mahalingam (2005) and Rui, de Jong, & ten Heuvelhof (2008), who have conducted research in the transport sectors in India and China, respectively, have also reported similar difficulties in getting access to respondents.

To address these challenges, the respondents were required to be convinced of the genuine and academic nature of the study, along with the confidentiality of their responses. The respondents were made comfortable with participating in the study by providing a letter of support from the university, emphasizing confidentiality and its academic nature. Further, the background of the researcher (i.e., Indian government service), enabled the respondents to feel comfortable in answering the survey items. At the same time, besides verbal assurances to the respondents that their responses would be kept confidential, the survey questionnaire was modified such that the respondents were neither required to provide their signatures, name, nor any other identification information. Also, to make the task of filling out the survey questionnaire as easy as possible for the respondents, the questionnaire was made available in various formats: web form, Adobe Acrobat® document, and Microsoft Word® document, with the respondents free to chose the format they were most comfortable with.

The managers were contacted using telephone calls, short messaging services, emails, and postal letters, and invariably 3 to 4 attempts were required to be made before the questionnaire was filled out and returned. The managers
were not compensated in any manner for participating in the study. After an extensive 3 month data collection effort, 56 survey responses from 45 distinct projects were collected. However, after accounting for missing data in the questionnaires and complementing it with the manager’s and project’s profile, full information is available on only 42 projects, and these have been used in the empirical study.

Due to the use of the snowballing method to identify likely respondents, we very soon lost count of the people to whom the survey was forwarded, hence the response rate cannot be calculated. However, we can calculate the coverage of the survey by considering the universe of projects that were targeted. This coverage rate comes to 25.5%, as responses were received from 45 of the 176 projects that constituted our sample universe.

**Measurement of the Variables**

**Firm’s Experience**

The main hypothesis (i.e., Hypothesis 1a, 1b, 2a, & 2b) in the theoretical model proposed in Chapter 4 argues for the effects of the firm’s focus of business on the use of coordination mechanisms. In the context of highway construction using the PPP mode, two distinct kinds of firm focus are relevant (i.e., a firm’s focus on the technical domain of highway construction and a firm’s focus on the organizational domain in the PPP way of working). Data from secondary sources has been used to construct these variables.

Very recently (in March 2011), the NHAI changed its bidding process for highway projects, and instead of carrying out technical evaluation of the bidding firms each time a project is to be taken up, decided to prequalify construction
firms active in the Indian highway sector. To qualify for bidding in future highway projects, construction firms were requested to provide complete details of their current financial profile and the last five years of construction experience in specified formats. The data provided by the individual firms was then crosschecked by government personnel, and the finalized formats compiled and shared on the NHAI website in May 2011. The measures of a firm’s focus are based on this authenticated data of a firm’s experience in different domains.

As firms may possess construction experience in many different domains, the nature of the construction project specifies the kind of experience the firm has. Distinguishing among the different kinds of projects in which the firms claimed experience, they were categorized based on the mandate given by the Planning Commission of India (www.pppindia.nic.in). As per this categorization, the technical experience of a firm is to be assessed in terms of (a) project experience in BOT projects in the focal sector (b) project experience in BOT projects in the core sector, (c) construction experience in the focal sector, and (d) construction experience in the core sector. Specific to the context of highway PPP projects, this categorization has evolved as, while ensuring no double counting of projects:

Category 1. Experience in eligible projects\(^1\) in the highway sector,\(^2\) which have been undertaken as a PPP projects, where output or services are made to a public sector entity or for providing non-discriminatory access to users.

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\(^1\) Eligible projects are those infrastructure projects that constitute a natural monopoly such as airports, ports, highways or power plants. Further, only those projects are considered in which the capital cost is more than Rs 100 crore, the firm is owns a minimum of 26% of the project, and the project has been undertaken in the last 5 years.

\(^2\) The highway sector is defined more broadly to include highways, expressways, bridges, tunnels, and airfields.
Category 2. Project experience in eligible projects in the core sector.  

Category 3. Construction experience in projects in highway sector.  


**Firm’s focus on highway domain**  

The firm’s focus on a sector refers to the degree to which the focal sector is a dominant line of business for the firm, and is reflected by the proportion of its total revenue that it receives from this sector. Accordingly, a firm’s highway focus is operationalized as the ratio of a firm’s experience in the highway domain to the total construction experience of the firm. More specifically, it was computed as a ratio of the sum of the capital values of projects in category 1 and category 3, divided by the sum of the capital value of all the construction projects executed by the firm (categories 1-4 combined).  

**Firm’s focus on PPP way of working**  

The firm’s focus on PPP refers to the degree to which the PPP way of working in projects is the dominant line of business for the firm, and is reflected by the proportion of total revenue that it receives from undertaking PPP projects. Accordingly, a firm’s PPP focus is operationalized as the ratio of a firm’s experience coming from the PPP projects to the total construction experience of the firm. More specifically, it was computed as the ratio of the sum of the capital values of projects in category 1 and category 2, divided by the sum of the capital values of projects in category 1 and category 2.

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3 The core sector includes a broader set of infrastructure, such as power plants, telecom, ports, airports, railways, metro rail, industrial parks and estates, logistics parks, pipelines, irrigation, water supply, sewerage, and real estate development.
value of all the construction projects executed by the firm (category 1-4 combined).

**Firm’s total experience**

The firm focus variables are ratio variables, and it is essential that the model using ratio variables should have the denominator as a control in the model (Wiseman, 2009). Hence, the sum of the capital value of all the construction projects executed by the firm (categories 1-4 combined), which is the denominator in both of the focus variables, was used as control in the model.

**Manager’s Experience**

The survey questionnaire used to capture the manager’s perception of the use of coordination mechanisms also collected a demographic and experience profile of the respondent. However, to ensure that we had a higher response rate, the respondents were not restricted to projects managers (PM), but instead included other managers who were closely associated with the project’s working (i.e., public managers (PD) and consultant team leaders (IC)). Hence, the demographic information reported in the survey questionnaires did not always provide the experience profile of the project manager. Consequently, we had to once again contact the firms and collect the experience profile of the project manager. For the projects in which the survey had been filled out by the project managers, this second phase of data on the manager’s experience profile reported exactly the same data as reported in the earlier survey, assuring us that
no problems existed in managers recalling and reporting their own experience profiles.  

The proposed model seeks to study the effects of three distinct kinds of managerial experiences (i.e., highway experience, PPP experience, and firm tenure). Hence, when managers were contacted they were requested to indicate: the number of years (and number of projects) that they have been associated with the highway sector, in any role; the number of years (and number of projects) that they have been associated with PPP projects; and their firm tenure, or the year that they had last joined the firm. This information was used to create the independent variables about the manager’s experience.

**Use of Boundary Objects for Coordination**

The boundary objects for coordination at the firm’s boundary are comprised of schedules and plans prepared by mutual consultation (Fang & Zou, 2009), along with operational targets, rules, and procedures which are jointly prepared (Fang & Zou, 2009; Luo, 2008; Schreiner, Kale, & Corsten, 2009). In the context of highway project coordination, five survey items were used to measure the manager’s perception of the extent of use of these boundary objects in the coordination of work among the managers of the client (PD), private firm (PM), and consultant (IC). Specifically, the survey responses were recorded using a five point Likert scale, with the scale being not at all, low, moderate, high and very high. The items measured the degree to which scheduling and planning has been done in consultation with other project agencies, has been agreed upon by

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4 In a few cases, the managers responsible for the projects could not be identified. Here, the experience information of these managers was collected from people who had known them personally.
different agencies, has specified operational targets, has specified operational
rules and procedures, and has specified the involvement of the different agencies.
These are items 19 to 23 in the survey questionnaire presented in the appendix.
The responses to two of these items correlated with the other three items at less
then 0.4, hence they were discarded to improve the reliability of the subsequent
measure to be used in the analysis. (3 items, Cronbach’s alpha 0.79)

**Use of Common Ground for Coordination**

A set of five survey items measured the emphasis that the managers (PD,
PM, and IC) placed on the use of common ground for coordination. The
responses were recorded on the same scale used for measuring the use of
boundary objects. The items measured the degree to which shared
understanding, cultural similarities (Gulati, Lawrence, & Puranam, 2005; Luo,
2008), and shared identity and informal norms (Malone & Crowston, 1994) exist
in the project, and the extent to which problems are treated as joint rather than
individual (Gulati & Sytch, 2007). These are items 36 to 40 in the survey
questionnaire presented in the appendix. (5 items, Cronbach’s alpha 0.90)

**Amount of Coordination**

Different projects work with different levels of coordination, that is some
have high levels of coordination while others don’t. Accordingly, to bring
homogeneity in the projects studied while studying the antecedents to the use of
different coordination mechanisms, the total level of existing coordination in the
project must necessarily be controlled.

Primarily guided by the measures of coordination used by Schilke &
Goerzen (2010) and Mohr & Spekman (1994), a set of three survey questions
was used to access the amount to which coordination existed in the project.
These survey questions asked the survey participant to indicate the extent to
which the partners in the alliance coordinated in a smooth and cordial manner,
and coordinated in making changes to the project to accommodate project-level
uncertainty. These were the first three questions asked and are items 1-3 in the
questionnaire. (3 items, Cronbach’s alpha 0.80)

**Use of Contract for Coordination**

PPPPs are contractually governed alliances. After a decade of experience in
PPP highway upgradation, the Indian government has reached a high level of
maturity in drafting long-term concession agreements for governing such
alliances, and a model concession agreement has been drafted. This model
agreement is used as a template for drafting project-specific contracts.
Consequently, while the project-specific contracts differ in the technical
parameters arising out of highway alignment and geographic location, the
contracts are very similar in many “boilerplate” or common clauses, such as
arbitration clauses, role and responsibilities (Reuer & Arino, 2007; Sampson,
2004).

Contracts, while providing a financial and legal framework for the project,
play an important role in facilitating joint problem solving and guiding the
interaction between the transacting parties, moreso in non-spot market
transactions like alliances (Argyres & Mayer, 2007). They define roles and
responsibilities, decision and control rights, communication patterns, contingency
planning, and dispute resolution mechanisms (Argyres & Mayer, 2007). Further,
these mold the actions that partners take while coordinating. Accordingly, while
the concession contracts are similar, based on the same model concession agreement, the manner in which they are used in the project can significantly vary. For example, the contract clauses governing the project may be rigidly or flexibly enforced while working on the project (Faems, et al, 2008), making the project-level working different, despite the use of similar contracts governing them.

To account for the project level differences that come from a difference in emphasis on different contractual clauses, the emphasis on the use of contracts for coordination has been measured and used as a control in the analysis. This measure refers to items 4-6 in the survey questionnaire. One of these items was discarded due to poor correlations with the others. (2 items, Cronbach’s alpha 0.86).

**Project Specific Characteristics**

Projects differ in their core characteristics, and these characteristics can mold the way coordination is done. For instance, the size of a project increases its complexity level, such that larger projects require more time and effort to coordinate (White & Lui, 2005). This makes it is essential to control for project-specific characteristics while studying our research question. Project characteristics along several dimensions have been compiled during the data collection effort. These include the cost of the project, the length of the highway being built, the quality of the detailed project report (DPR), the extent of land acquisition at start of the project, the stage of project progress, the nature of the concession agreement (i.e., positive or negative grant, toll or annuity), debt rating of the SPV, the number of years of concession, the kind of concession
agreement, the date of signing of concession agreement, the initial date of completion, and the nature of involvement of the parent private firm in the project. Also, a subjective list of the key problems faced by the projects surveyed has been compiled. Relevant to the study of coordination, the empirical analysis controls for the two most important of these variables. These were identified as the proportion of land acquired at the beginning of the project and the quality of the detailed project report (DPR).

The availability of land is one of the biggest hurdles in the upgradation of highways in India (Bandyopadhyay, Swaminathan, & Rohatgi, 2008). The extent to which land is acquired and made available to the SPV at the start of the project determines the degree of interdependence among the different project agencies. Hence, the need to control for the percentage of land acquisition at the start of the project. A single item survey measure was used to measure this variable.

The quality of the DPR signifies the degree to which the project’s uncertainties have been identified and documented ex-ante, enabling project managers to plan for them in advance. A DPR of poor quality leaves too many technical and project issues unaddressed, increasing the interdependence between the project agencies, as they need to address these issues jointly during project execution. A single item survey measure was used to capture the perception of the survey respondent about the quality of the DPR, using a five point Likert scale with 1 as bad and 5 as high quality.
Firm Specific Characteristics

Besides the focus of a firm’s business, the size of the firm can also potentially affect the way in which the firm carries out coordination (Robson, Katsikeas, & Bello, 2008). Larger firms have specialized corporate systems and structures in place to provide project support, while smaller firms need to share their corporate resources, thereby reducing the benefits of specialization to the projects. The net value of the firm, as reported by the firm to the NHAI for prequalification, was available for use as a control variable. However, this was correlated with the firm’s total experience at 0.90, and its use in the empirical model would have resulted in very high col-linearity between independent variables, and thus was not used in the model.

Discriminate Analysis of the Survey Measures

The manager’s perceptions of the amount of coordination and the emphasis placed on the use of different coordination mechanisms were captured at the same time using the survey instrument. While the different measures had good reliabilities (the lowest being 0.79, against the generally accepted cutoff limit of 0.7 (Nunnally, 1978)), it is also essential to ensure convergent and discriminate validity of the different measures. Guided by Lichtenthaler, Ernst, & Hoegl (2010) and Srikanth & Puranam (2010), who had also show validity of the survey measures they used, we first carried out an exploratory factor analysis (with orthogonal rotation), and later a confirmatory factor analysis. The exploratory factor analysis was conducted by forcing a theory-driven four-factor solution. The results are tabulated in Table 5-1. The variables were found to cleanly load on their respective constructs.
In the confirmatory factor analysis, all four constructs were entered as endogenous variables and their respective items as observed variables. The four factors have significant factor loading, as indicated by t-values significantly more than 1.96. The four-factor model (RMSEA=0.07, CFI=0.77) was also far superior to the single factor model (RMSEA =0.18, CFI = 0.22). With the greatest common variance between the estimated factors being only 0.31, the large composite reliabilities indicate strong discriminate validity, supporting the findings of the exploratory factor analysis (Hair, Black, Babin, Anderson, & Tatham, 2006).
Table 5-1. Results of exploratory and confirmatory factor analysis of the coordination survey items

<table>
<thead>
<tr>
<th>Construct</th>
<th>Item</th>
<th>Mean</th>
<th>SD</th>
<th>Factor loading</th>
<th>T-value</th>
<th>Variance extracted</th>
<th>Construct reliability</th>
<th>Amount of coordination</th>
<th>Use of contract</th>
<th>Use of boundary objects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amount of coordination</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.80</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A1</td>
<td>3.56</td>
<td>0.82</td>
<td>1.00</td>
<td>1.00</td>
<td>0.78</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A2</td>
<td>3.43</td>
<td>0.79</td>
<td>0.92</td>
<td>5.29</td>
<td>0.74</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A3</td>
<td>3.13</td>
<td>0.99</td>
<td>1.00</td>
<td>4.78</td>
<td>0.50</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use of contract</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.86</td>
<td>0.18</td>
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<tr>
<td>C1</td>
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<td>0.87</td>
<td>1.00</td>
<td>1.00</td>
<td>0.83</td>
<td></td>
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<tr>
<td>C2</td>
<td>4.04</td>
<td>0.80</td>
<td>0.89</td>
<td>4.59</td>
<td>0.85</td>
<td></td>
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<tr>
<td>Use of boundary objects</td>
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<td></td>
<td></td>
<td></td>
<td>0.80</td>
<td>0.25</td>
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<tr>
<td>P1</td>
<td>3.18</td>
<td>1.06</td>
<td>1.00</td>
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<td>0.42</td>
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<td>P2</td>
<td>3.26</td>
<td>1.05</td>
<td>1.28</td>
<td>4.68</td>
<td>0.78</td>
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<tr>
<td>P3</td>
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<td>0.84</td>
<td>3.87</td>
<td>0.49</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.90</td>
<td>0.31</td>
<td>0.30</td>
<td>0.28</td>
</tr>
<tr>
<td>S1</td>
<td>3.36</td>
<td>1.04</td>
<td>1.00</td>
<td>1.00</td>
<td>0.59</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S2</td>
<td>3.23</td>
<td>0.99</td>
<td>0.88</td>
<td>5.60</td>
<td>0.54</td>
<td></td>
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</tr>
<tr>
<td>S3</td>
<td>3.45</td>
<td>0.99</td>
<td>1.07</td>
<td>7.16</td>
<td>0.78</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>S4</td>
<td>3.28</td>
<td>0.95</td>
<td>1.01</td>
<td>6.89</td>
<td>0.79</td>
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<tr>
<td>S5</td>
<td>3.35</td>
<td>1.15</td>
<td>1.02</td>
<td>5.67</td>
<td>0.40</td>
<td></td>
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</tr>
</tbody>
</table>

Note: The whole set of survey responses (52 complete responses from the 56 total responses received) have been used to create this table.
CHAPTER 6
RESULTS

The theoretical model proposed in Chapter 4 was tested using two separate ordinary least square (OLS) regressions, one for each of the dependent variables (i.e., use of boundary objects and use of common ground for coordination). The first part of this chapter reports the results and the robustness checks that were carried out. In the second part of the chapter, an alternate theoretical model is proposed. The small sample size and the inability to use more robust testing procedures prevented us from extensively testing this alternative model, and only the preliminary results of this model are being presented.

Variables and their Correlations

Table 6-1 summarizes the means, standard deviations, minimum, and maximum values of the studied variables. All of the studied variables were found to span the full range of possible values and possess large standard deviations. For instance, the projects in the sample used the different coordination mechanisms to different degrees. That is, while in some projects no coordination was reported, in others coordination existed to the full level, with the standard deviations of the different survey measures of coordination lying between 0.75 and 0.87. Similarly, the firms studied also varied in their focus. While some firms focused completely on the highways sector, some focused only on PPP projects, and still others had no or negligible prior experience in the highways sector or PPP working and were new entrants in the domain of PPP highway construction.

Table 6-1 also reports the correlations between the studied variables and their significance levels. While moderate correlations (i.e., 0.30 at a significance level less
then 0.05) were found between the different survey measures measuring coordination, they are unlikely to be of concern in the empirical analysis, as two distinct OLS regressions were run. The highest correlation found was 0.51 between the use of contracts and the use of boundary objects for coordination, and the other correlations lay in the range of 0.37 to 0.50. As these measures refer to use of different dimensions of the same construct (i.e., coordination), such high correlations are expected. However, viewing these high correlations in the light of the exploratory and confirmatory analysis of the variables presented in Table 5-1, said correlations are unlikely to be a source of concern.

The other set of significant and high correlations were found between the quality of the DPR and the use of coordination mechanisms, and these were all negative, lying between 0.48 and 0.28. The quality of the DPR signifies the degree to which the project’s uncertainties have been identified and documented ex-ante, such that project managers can plan for them in advance. A DPR of poor quality leaves many technical and project issues unaddressed, which increases interdependence between the project agencies, as now they have to come together to address these issues jointly during project execution. The high and negative value of the correlations found supports the above argument. More specifically, the results show that an increase in the quality of the DPR is negatively associated with coordination done in the project. This can also be viewed as a confirmation of the seminal argument by Thompson (1967) that higher interdependence requires higher coordination, while lower interdependence requires lesser coordination.
The firm’s focus on highways was also found to have high correlations with the different survey measures of coordination mechanisms. However, it is only significantly correlated with the use of boundary objects, use of contracts, and total amount of coordination, and not with the use of common ground. This pattern of correlations lends support to the arguments in Chapter 4, where it was argued that firms with a highway focus are more used to using their own set of highway-specific boundary objects, and are guided in their work by their larger exposure to work being governed by short-term arms length contracts, wherein common ground has little role to play.

Regression Results

Antecedents to the Use of Boundary Objects for Coordination

Table 6-2 reports the results of the OLS regression testing the antecedents to the use of boundary objects for coordination. Hypothesis 1a argued that the firm’s focus on the highway sector makes it emphasize the use of boundary objects, as the firm not only possesses a unique and specialized set of boundary objects to be used for coordination, but there also exists an unambiguity in their use due to the presence of an agreement between the project and corporate levels on what, how, and where they are to be used. The results support this argument ($\beta = 0.72$, s.e. = -0.41 in Model II).

However Hypothesis 2a, which argued for similar positive effects of the firm’s focus on PPP working, is unsupported ($\beta = -0.13$, s.e. = -0.37 in Model II).

Six hypotheses were made arguing for the effects of different kinds of managerial experience on the use of boundary objects (i.e., Hypothesis 3a, 4a, 5a, 6a, 7a, and 8a). However, we only found support for one of these. The firm’s highway experience was found to be positively moderated by the manager’s PPP experience ($\beta = 0.36$, s.e. = -0.12 in Model V). These results support Hypothesis 4a. This hypothesis argued that
managers with a high amount of PPP experience emphasize the use of boundary objects made available by the firm’s highway experience, as they see them as a mechanism to bring in transparency in working and create a trail of the work. The argument is primarily about how a manager’s PPP experience compensates for the firm’s lack of understanding of PPP working. The interaction effects have been plotted out in Figure 6.1. The plot shows that managers with high PPP experience are able to increase the emphasis on the use of boundary objects, whereas managers with low PPP experience are unable to bring about any such compensatory effects.

The interaction effects are not only significant but they also improve the overall R-square of the model from 0.52 (Model III) to 0.63 (Model V). Further, the interaction effects remain significant in the different variations of the model tested (i.e., Model X, XI & XII).

Antecedents to the Use of Common Ground for Coordination

Table 6-3 reports the results of the OLS regression testing the antecedents of the use of common ground for coordination. In this case, no direct effects of the firm’s focus on the use of common ground were found. That is, main Hypothesis 1b and 2b did not find support ($\beta=-0.08$, s.e. = -0.44 and $\beta=-0.28$, s.e. = -0.40, respectively in Model II).

While no main effects of managerial experience were hypothesized, the results reported in Table 6-3 show that the manager’s PPP experience has significant negative effects on the use of common ground for coordination, although the effects are small ($\beta=-0.08$, s.e. = -0.04 in Model III).

Again, six hypotheses about the interactions of the firm’s focus and the manager’s experience were tested (i.e., Hypothesis 3b, 4b, 5b, 6b, 7b, and 8b). Two of these interactions were found significant. Firstly, the firm’s highway focus and manager’s PPP
experience were found to positively interact to affect the use of common ground for coordination (β = 0.30, s.e. = -0.14 in Model V). The results are plotted in Figure 6-2. The plots shows that with a higher PPP experience managers tend to emphasize the use of common ground for coordination when located in a firm with a greater highway focus, whereas these amplification effects do not exist when the managers possess low PPP experience. These results support Hypothesis 6a, wherein it was argued that the manager’s PPP experience compensates for the firms lack of experience in understanding how work is done in PPP projects, such that the manager with greater PPP experience reduce the negative effects of the firm’s focus on use of common ground. The plot supports the argument.

Secondly, the firm’s PPP focus and manager’s firm tenure were found to interact (β = -0.13, s.e. = -0.06). Surprisingly, and contrary to our expectations as per Hypothesis 8b, these interactions were found to be negative. This negative interaction effect is not only significant at the 0.05 levels, but its significance level and sign is consistent across the various empirical models. These results are plotted in Figure 6-3. Hypothesis 8b has argued that managers with high firm tenure in a PPP-focused firm complement the firm’s emphasis on the use of common ground for coordination. The plotted results in Figure 6-4, however, show that managers with high firm tenure decrease the emphasis placed on use of common ground, and the effects get more pronounced as they work in firms with a stronger PPP focus. On the other hand, managers with low firm tenure tend to boost the use of common ground as the PPP focus of the firm increases. Possible explanations for these results are discussed in detail in Chapter 7.
These interactions independently improve the models R-squared from 0.52 (Model III) to 0.58 (Model V & Model IX), and together they improve the R Squared to 0.68 (Model XI). Also, the effects stand significant in various variations of the Model tested i.e, Model X, XI, & XII.

**Robustness Check**

While testing for the effects of manager and firm experience on the use of the different mechanisms of coordination, no attempts have been made to compare and contrast between the usages of the different coordination mechanisms. Hence, two separate regressions were run with different dependent variables (i.e., use of boundary objects and common ground), while studying their antecedents. However, both of the dependent variables belong to the domain of coordination, and it becomes important to study the degree to which the variances explained by the two separate equations may overlap, and whether the results found would stand when both the equations are simultaneously estimated. Hence, we run a simultaneous unrelated regression (SUR) with both the dependent variables. These results are presented in Table 6-4. The results of this simultaneous regression show that the effects found earlier remain significant while simultaneously estimating the antecedents of the two mechanisms of coordination. Moreover, in some cases the level of significance increase. This assures us that the antecedents of coordination identified above explained unique variances in the dependent variables.

**Alternative Model**

This study has sought to highlight the role played by managers’ and firms’ characteristics in managing alliances and coordinating work performed at the interface between organizations, underscoring the role of the quality of human capital.
(capabilities/experience specific to the highway industry, PPP form, and the firm).

However, while empirically testing the hypothesis, the existing amount of coordination was used as a statistical control. This was motivated by the recognition that different projects achieve different levels of coordination, and by controlling for the existing amount of coordination we would be able to bring in homogeneity in the studied sample, such that the effects of other meaningful variables which may affect the studied relationship may be separated out.

However, an alternate conceptualization is also possible. The different mechanisms of coordination (use of boundary objects and common ground) can be viewed as the distinct coordination mechanisms through which the firm’s focus and manager’s experience bring about coordination in the project. That is, it can be argued that the variation in the extent to which coordination is achieved may exist on account of the use of the different coordination mechanisms. ¹

More specifically, this alternate conceptualization argues that while the firm’s focus and manager’s experience interact to bring about coordination, the coordination that they achieve may come about by two alternate pathways, that is by the use of boundary objects or by the use of common ground. This alternate conceptualization makes the different mechanisms of coordination mediate the relationships between the independent variables (firm focus and manager experience variables) and the extent to which the project is coordinated. This conceptual model is presented in Figure 6-5.

¹ While making this contention, we are still far from arguing that higher coordination is any kind of a performance measure, as projects may require different levels of coordination, and different kinds of coordination mechanisms may lead to a different performance, and this relationship would be highly contingent on the task and environment characteristics.
Testing this first stage moderation mediation model requires that the standard errors of the first stage interacting variables be estimated (Edwards & Lambert, 2007). The small sample size (42) in this study restricts us from carrying out such an analysis and testing the alternate conceptualization. However, some preliminary analysis of this model is in order, and is presented in Table 6-5. The table presents the results of OLS regression with amount of coordination (extent of which coordination is achieved) as the dependent variable. These results, though preliminary in nature, are quite interesting and need elaboration.

Firstly, the different mechanisms of coordination are associated with different levels of coordination achieved. It is interesting to note that while the use of common ground is significantly associated with the extent of coordination in the project, across all models tested, the use of boundary objects is only significant in some cases. At the same time, the use of contracts for coordination is only significant when the other mechanisms of coordination (boundary objects and common ground) are not present in the model. Hence, it appears that the different coordination mechanisms may be sharing different portions of their variance with the total amount of coordination, emphasizing their discriminate validity.

Secondly, the key variable that was earlier found to affect the use of boundary objects for coordination (the interaction term of the firm’s highway focus and the manager’s PPP experience) emerges as a significant predictor of the amount of coordination (Models III, VIII, X & XI). In contrast, the experience variable that predicts the use of common ground for coordination does not significantly affect the amount of coordination in the project. The plots of the interaction effects of the firm’s focus and the
manager’s PPP experience on the amount of coordination, as per the alternate model, are presented in Figure 6-6. The interaction effects emerge as very strong, and can be interpreted in the following manner: the effects of the firm’s highway focus on the extent of coordination achieved in the project is moderated by the manager’s PPP experience, such that the firm’s focus on highways leads to lesser coordination if the manager has greater PPP experience, but it leads to increased coordination if the manager has lesser PPP experience. These results once again underscore the importance of recognizing that firm and manager experiences interact in their effects on coordination. Secondly, these results identify the uniqueness of the PPP context by indicating that the managers with prior experience in PPP working (i.e., used to the SPV’s way of working), create a distance between the firm and the project and therewith underemphasize the need for coordination at the project level. These results are consistent across the different models, with or without the mechanisms of coordination in the model (Model VIII and Model X, plotted in Figure 6-5a & Figure 6-5b).

The above results can also be interpreted to indicate that while the interaction effects of the firm’s highway focus and the manager’s PPP experience are only partially mediated by the use of boundary objects, the interaction effects of the firm’s PPP experience and the manager’s firm tenure are fully mediated by the use of common ground. A Sobel test was conducted to check for this mediation (Baron & Kenny, 1986). Mediation by use of common ground was found to be significant at the 0.05 level, whereas mediation by the use of the boundary object variable was significant at the 0.10 level.
<table>
<thead>
<tr>
<th>Item</th>
<th>Measure</th>
<th>Mean</th>
<th>S.D.</th>
<th>Min</th>
<th>Max</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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<th>11</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Use of Boundary Objects</td>
<td>Survey item</td>
<td>3.34</td>
<td>0.82</td>
<td>1.67</td>
<td>5.00</td>
<td>0.39</td>
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<tr>
<td>2</td>
<td>Use of Common Ground</td>
<td>Survey item</td>
<td>3.21</td>
<td>0.87</td>
<td>1.00</td>
<td>4.80</td>
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<td>3</td>
<td>Total Amount of Coordination</td>
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<td>1.33</td>
<td>4.67</td>
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<td>Use of Contracts</td>
<td>Survey item</td>
<td>3.92</td>
<td>0.81</td>
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<td>5.00</td>
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<td>Quality of DPR</td>
<td>Survey item</td>
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<td>1.00</td>
<td>5.00</td>
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<td>(0.48)</td>
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<td>Land Acquisition Status</td>
<td>Percent</td>
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<td>0.30</td>
<td>0.00</td>
<td>1.00</td>
<td>(0.23)</td>
<td>(0.10)</td>
<td>0.07</td>
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<td>Firm’s Construction Experience</td>
<td>Value</td>
<td>11.97</td>
<td>15.77</td>
<td>0.15</td>
<td>93.14</td>
<td>(0.02)</td>
<td>(0.13)</td>
<td>(0.06)</td>
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<td>8</td>
<td>Firm’s Focus on Highways Ratio</td>
<td>Value</td>
<td>0.65</td>
<td>0.32</td>
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<td>1.00</td>
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<td>0.34</td>
<td>0.41</td>
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<td>Firm’s Focus on PPPs</td>
<td>Ratio</td>
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<td>0.33</td>
<td>0.00</td>
<td>1.00</td>
<td>0.03</td>
<td>(0.07)</td>
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<td>(0.03)</td>
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<td>Years</td>
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Table 6-5. Alternate model results. Antecedents to the extent of coordination achieved in PPP projects. (n=42)

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Figure 6-1. Plot of interaction effects of a firm’s highway focus and a manager’s PPP experience on use of boundary objects.
Figure 6-2. Plot of interaction effects of a firm’s highway focus and a manager’s PPP experience on use of common ground.
Figure 6-3. Plot of interaction effects of a firm’s PPP focus and a manager’s firm tenure on use of common ground.
Figure 6-4. The alternate model
Figure 6-5. Plot of interaction effects in alternate model. A) Interaction of firm’s highway focus and manager’s PPP experience on amount of coordination (without boundary objects and common ground in model). B) Interaction of firm’s highway focus and manager’s PPP experience on amount of coordination (with boundary objects and common ground in model). C) Interaction of firm’s PPP focus and manager’s firm tenure on amount of coordination.
Figure 6-5. Continued
Figure 6-5. Continued
CHAPTER 7
DISCUSSION

This chapter discusses the empirical findings, firstly in light of what we already know about coordination of work, and secondly in the context of PPPs wherein work is coordinated at organizational boundaries, the public-private interface in our case. While doing so, the chapter develops the coordination perspective of work and identifies the distinctive aspects of PPP working. The need for these developments was felt when gaps in the literature were found while reviewing the literature on organizational coordination and PPPs to study the research questions put forward in Chapter 1.

On delving into the literatures studying coordination in organizations and organizational interfaces (i.e., alliances) it emerged that the literatures have different foci, and both had failed to recognize the different aspects of work in which coordination is done. Hence, in this chapter a theoretical model is proposed developing the concept of aspects of coordination. Similarly, while studying the existing PPP literature it emerged that although the literature is vast and ever growing, it has little to say about coordination of the work in PPPs. To substantiate, both the academic and practice literatures, which study PPPs, are restrictively focused on how structuring mechanisms, like contracts, guide PPP working and fail to build a comprehensive organizational view of PPPs, which covers both structuring and emergent aspects of PPP working. Making an attempt towards addressing this gap in the literature, the later part of this chapter identifies some of the key aspects that would enable the development of a more comprehensive organizational view of PPPs.
An Integrative Coordination Perspective

Contributions to Current Literature

Organizations achieve their fundamental purpose by coordination of work, and this coordination becomes more important when work is required to be done at the boundaries of the organizations. Alliances are one such organizational arrangement wherein work is required to be coordinated at the firms interface, and alliances face coordination challenges to a larger extent (Child & Faulkner, 1998; de Rond & Bouchikhi, 2004; Harrigan, 1985). While studies of coordination in organizations investigate how coordination is carried out (e.g., Lawrence & Lorsch, 1967; Tsai, 2002), studies of coordination at organizational interfaces, such as alliance studies, are primarily concerned with the antecedents and consequences of coordination, and narrowly focus on the degree to which coordination is done. This study contributes to the current literature, firstly by identifying the different mechanisms of coordination used at firm’s interfaces, and secondly by identifying the role-played by the manager in carrying out such coordination.

Coordination mechanisms used at organizational interfaces

Organizational literature studying coordination has identified a large number of modes, means, and mechanisms by which coordination is carried out (Ref to Table 2-1 for a summary). At the same time, the literature has also used many different categorizations to classify them, for example group, individual, and impersonal modes (van de Ven, Delbecq, & Koenig, 1976); formal and informal modes (Fang & Zou, 2010; Gulati, Lawrence, & Puranam, 2005; Jansen, Tempelaar, Van Den Bosch, & Volberda, 2009; Martinez & Jarillo, 1989); objects, plans, roles, routines, and proximity (Okhuysen & Bechky, 2009); programmed and non-programmed modes (Argote, 1982); and
modularization, ongoing communication, and tacit coordination mechanisms (Srikanth & Puranam, 2010). As discussed in Chapter 2, these varied ways of categorizing coordination mechanisms make it difficult to aggregate the existing literature. Accordingly, a generic three-fold categorization of coordination mechanisms was developed, consisting of: i) coordination by the structuring of tasks by task design or organizational design, such as use of contracts; ii) coordination by the enactment and use of purposive boundary objects; and iii) coordination by relying on common ground. This categorization is an improvement over the earlier attempts as it is theoretically motivated, and thus enables us to aggregate existing studies of coordination, as is evident during the formulation of hypotheses in Chapter 4.

While Chapter 2 discusses the theoretical differences between these categories and Table 2-1 categorizes the different mechanisms of coordination studied in the existing literature as per this refined categorization, the empirical study further emphasizes this categorization by finding discriminant validity between them (Ref to Table 5-1). Hence, the first contribution of this study lies in the specification, development, and confirmation of a robust categorization of the mechanisms of coordination. While this categorization is new to the coordination literature, it is similar to the categorization of motivational mechanisms suggested by Bridoux, Coeurderoy, & Durand (2011) in the Groups and Teams literature. These authors argue that teams cooperate using three generic and distinctive motivational mechanisms: monetary incentives, emphasis on disciplined cooperation, and reliance on benevolent cooperation, each of which bears similarities to the different coordination mechanisms identified by us.
Role of the manager in coordination

The coordination literature identifies task and organization characteristics as the primary antecedents to the use of coordination mechanisms. Guided by this research, this study sought to examine how the focus of a firm’s business affects the emphasis placed on the use of different coordination mechanisms. The empirical study found the firm’s focus on the technical domain of working (i.e., highway experience), to be positively associated with the use of purposive boundary objects, but not with the use of common ground. Further, the firm’s focus on the organizational way of working (i.e., PPP organizational working), was not found to have any direct effects on the use of different coordination mechanisms. These mixed findings lead us to believe that the antecedents to the use of coordination mechanisms cannot be simply linked with a firm’s characteristics, and that there may be other important factors at play, which are being ignored in the literature.

Our search for other factors that may affect the use of coordination mechanisms was guided by the upper echelons literature, which has found strong evidence of the important role played by managers in the working of firms. Herein, the experience of the manager has been found to determine the strategic choices made by him (Finkelstein, Hambrick, & Cannella, 2008). For instance, a manager’s international experience makes him diversify the firm internationally, as this experience gives the manager a broader understanding of the global marketplace (Chen & Stucker, 1997). On the other hand, an increase in a manager’s experience in a position (i.e., firm tenure) makes him avoid strategic changes, as tenure makes him follow discernible patterns over time and makes him committed to the firm’s status quo (Henderson, Miller, & Hambrick, 2006). Similarly, a manager’s industry experience makes him use more of the industry-specific
practices, as industry experience inserts him into a social setting in which actions, contexts, and outcomes are subject to industry-level shared interpretations (Burrell, Morgan, & Morgan, 1979; Hambrick, Geletkanycz, & Fredrickson, 1993). This stream of literature, while arguing for these broad effects of manager’s characteristics lacks studies that examine the mediating pathways through which the manager affects firm strategy and performance. We argue that the manager’s emphasis on the use of coordinating mechanisms is one such pathway through which manager molds a firms working.

The logical next step involves identifying the direct effects of a manager’s experience on the use of coordination mechanisms. While no direct hypotheses were made of these relationships, the intermediate models in the empirical study do test for such direct effects, that is Model 3 in Table 6-2 and Model 3 in Table 6-3. Of the three kinds of experience modeled in the study (technical domain experience, PPP working experience, and length of firm tenure), we only found direct negative effects of manager’s PPP working experience on the use of common ground ($\beta = -0.08$, s.e. = -0.04, Model III in Table 6-3). That is, one out of the six effects was found to be significant. Thus, it appears that some complex interplay of a firm’s and a manager’s characteristics may be at work when coordination is carried out at organizational interfaces.

In an attempt to identify these complex dynamics, we tested for the interaction effects of the firm’s focus and manager’s experience variables. By doing so, while contributing to the existing literature, we make two significant departures. Firstly, by underscoring the role played by the manager we contribute to alliance literature, which
has so far only empirically tested the effects of task and firm characteristics on the amount of coordination done (Bensaou & Venkatraman, 1995; Gerwin, 2004; Gulati & Sytch, 2007; Mesquita & Brush, 2008; Sobrero & Schrader, 1998; Srikanth & Puranam, 2011; Subramani & Venkatraman, 2003; White & Lui, 2005; Zaheer, McEvily, & Perrone, 1998). While the literature on alliance management has recognized the importance of the manager’s actions, no empirical tests of it exist, and this study provides the first such test (for e.g., Child & Faulkner, 1998; Galagan, 1990; Spekman, Isabella, & MacAvoy, 2000). Secondly, this research goes beyond the literature that empirically or theoretically identifies the antecedents of coordination to lie in the main effects of task, organization, or managerial characteristics. Specifically, this study determines that these characteristics interact in laying emphasis on the use of different coordination mechanisms, and there exists a need to identify these complex-moderating conditions.

The empirical study finds some moderating conditions. Firstly, the effects of a firm’s highway focus on the emphasis placed on the different mechanisms of coordination (i.e., the use of boundary objects and the use of common ground) is positively moderated by the manager’s PPP experience. However, the moderation effects on the different mechanism of coordination exist for different reasons. The effect of a firm’s highway focus on the use of boundary objects is positively moderated by the manager’s PPP experience, as the manager’s PPP experience enables him to put to use the practices and objects that the firm’s highway focus makes available to him. In effect, the manager complements the firm’s effects. That is, while the firm’s focus makes an unambiguous set of highway-specific practices available for use in the project for efficiency consideration, the manager emphasizes the use of these available objects
in the unique context of PPP working as these same objects also bring in transparency and leave a trail behind, and the manager better recognizes their importance on account of his greater PPP experience.

The positive moderation effects of the firm’s highway focus on the use of common ground by the manager’s PPP experience brings evidence that while the firm’s highway focus makes the firm deemphasize the use of common ground to coordinate work, the manager’s PPP experience reduces these negative effects. The firm’s highway focus reduces the emphasis on the use of common ground, as the firm is primarily guided by its experience in short-term contracts with the government, in which investments in common ground are not of much use. On the other hand, the manager with PPP experience is able to compensate for the firm’s lack of understanding of PPP working, and he carries out coordination by emphasizing the use of common ground, which he is able to recognize as important to work in the PPP context.

Contrary to our hypothesis, the effects of a firm’s PPP focus on the use of common ground were found to be negatively moderated by the manager’s firm tenure. Hypothesis 8b argued that a manager with a high firm tenure supplements the positive effects of a firm’s PPP focus on the emphasis placed on the use of common ground, as the manager was a part of the firm when the firm made the transition from the use of short-term highway contracts with the government to the use of long-term PPP concession contracts. The negative moderation effects found are not by chance, and their effects remain consistently negative in the different models tested. This makes us look for alternate explanations. One such explanation lies in recognizing the unique aspects of PPP working. PPPs distinctively involve bundling of risks and a long-term
focus, and these aspects are structurally addressed by the use of SPVs. The SPV, while localizing and containing the coordination of work within it, also creates a distance between the firm and the actual work. This is unique to SPVs, for on the one hand they exist as a division of the private firm, such that the work performed in the SPV is determined by the firm’s experience. On the other hand, the private firm exists as a holding company for the SPV, such that the financial and organizational responsibilities for the SPV solely lie with it and the SPV is fully responsible for the projects day to day working, along with the decisions taken by the stakeholders of the SPV. Consequently, managers with a longer firm tenure, while working to protect the firm’s long term interests feel the need to reduce the use of spontaneous mechanisms like common ground (which reduce transparency with the firm and do not leave a trail), when the firm is shouldering a large bundle of project risks but working in a distinct organization.

With these findings, this study contributes to the coordination literature by proposing and testing a more integrative model of coordination in the alliance context. That is, the study finds evidence that not only can coordination in the alliance context be brought about by the use of different mechanisms, but the manager’s experience plays an important role in molding the use of coordination mechanisms. Also, the firm’s characteristics and manager’s characteristics interact affecting the use of coordination mechanism. Contributing to the upper echelon literature, this research finds that the manager’s experience affects the firm’s actions by molding the emphasis that manager’s place on coordination mechanisms differently. At the same time, manager characteristics were found to have few direct effects, primary moderating the effects of the firm’s characteristics.
Developing the Coordination Perspective

The organizational literature studies why coordination is done (i.e., sources of coordination challenges), how it is done (i.e., mechanism and modes of coordination), and how much of it is done (i.e., amount and degree of coordination). But while doing so it ignores what is being coordinated. Consequently, the literature has overlooked the fact that work is multi-dimensional, and coordination is important in each of the different dimensions. For example, while working together coordination is required to be carried out both in exchanging information and also in conflict resolution. Each of these are distinct dimensions of work requiring coordination, and while coordination challenges may exist to different degrees in each of these dimensions, even the mechanisms and modes used to address these challenges may also be very different. For instance, while coordination in exchanging information can be done by the use of databases, communication, and information systems; coordination for conflict resolution requires the use of formal dispute resolution mechanisms, like arbitration, and recognition and accommodation of the other agency’s interests. Here the multiple dimensions or facets of work requiring coordination are referred to as different aspects of coordination.

Our recognition of the multiple aspects of work requiring coordination is not new to the vast coordination literature. However, existing studies do not explicitly distinguish among the various dimensions but instead club them together into a single construct or focus on only one of the many dimensions. For example, Gulati & Sytch (2007) in their study of the US automobile industry clubbed the different dimensions of work together and used a single construct of coordination, joint action. In this study, joint action referred to the extent to which firms in a buyer-supplier relationship coordinated in design, quality improvement, cost control, production modification, forecasting, mutual

**Aspects of coordination**

With a view to identify the different aspects of work coordination, the coordination literature was revisited. After an extensive exercise, which involved listing, categorization, and re-categorization of the aspects of work studied in existing literature, four theoretically different aspects of work requiring coordination were identified: monitoring and control, decision-making, information exchange, and conflict resolution. The need for identifying and differentiating among the different aspects of work emerges as important when one recognizes that work in different contexts essentially differs in the extent to which it requires emphasis on one or another aspect of work. For instance, coordination in the context of arms length contracts, like buyer-supplier relationships or civil contracting is essentially about monitoring and controlling the actions of the other agency. In contrast, research alliances primarily require coordination in the exchange of information, whereas joint marketing efforts primarily require coordination in decision-making.

When work is jointly performed, not only is the work performed required to be monitored and controlled, but also even the behavior and actions of the agency with which work is being coordinated may require monitoring. Monitoring and control possess coordination challenges that are above and beyond those brought in by motivational aspects, and are generally studied in the cooperation literature. Because managers are boundedly rational, even when incentives are fully aligned and the misalignments are of common knowledge, managers need to be aware of the activities
of the other agency. Hence, the need exists for the coordinated activities to be visible to the coordinating partners, such that the coordinating agencies may keep a watch on how the work is being performed together, and control it to ensure that the objectives are met. Many options for such monitoring and control exist, and the agencies coordinating the work may independently monitor and control the work, or they may come together and coordinate in monitoring and controlling the sub-tasks involved (Gulati & Sytch, 2007). To clarify, in the case of alliances, monitoring and control refers to the reliance on contractual clauses, use of joint reviews and meetings, or building up common trust with one another that reduces the need for the agencies to monitor each others work (Das & Teng, 2000; Kumar & Seth, 1998; Mayer & Nickerson, 2005; Salancik & Pfeffer, 1978; Poppo & Zenger, 2002; Williamson, 1985; Zollo, Reuer, & Singh, 2002).

When two or more agencies come together to perform a common task, the task is interdependently performed and shared decision-making is required to manage the interdependence in the task (Gulati & Sytch, 2007; Krishnan, Martin & Noorderhaven, 2006). While from the cooperation perspective, the incentive differences between exchange partners leads to a need for shared decision-making, from a coordination perspective shared-decision making is required to manage the interdependence between exchange partners, as managers are boundedly rational. In inter-organizational relationships, trust leads to performance as the exchange partners can carry out shared decision-making (Uzzi, 1997; Zaheer, McEvily & Perrone, 1998, pg 155). Also, in the context of alliances, routines have been argued to lead to improved
performance, as they facilitate decision-making in the alliance (Zollo, Reuer, & Singh, 2002, pg 709).

Information exchange between exchange partners is the other key aspect of work, which becomes important when work is done interdependently (see Carson, Madhok, Varman, & John, 2003, Krishnan, Martin & Noorderhaven, 2006; Gulati & Sytch, 2007). The need for information exchange arises on account of the information asymmetry inherent in interfirm exchanges (Zaheer, McEvily & Perrone, 1998, pg 144). Alliance studies have consistently recognized the importance of information exchange in interdependent work and while some have claimed it to be an important mediator between trust and performance, others argued that it has a moderating effect on the performance of work when done interdependently (Carson, Madhok, Varman, & John, 2003; Gupta & Govindarajan, 1991; Palay, 1984; Poppo, Zhou & Zenger, 2008; Krishnan, Martin & Noorderhaven, 2006; Mohr & Spekman, 1994; Uzzi, 1997; Zollo, Reuer, & Singh, 2002). Furthermore, the knowledge-based view of the firm sees it as a bundle of information, and the knowledge perspective of alliances views it as a conduit for the transfer and exchange of information, making the exchange of information a key aspect of work coordination.

An important aspect of alliance management is conflict management (Parkhe, 1993; Madhok, 1995), as alliances require continuous interaction between partners in which disagreements inevitably occur (Schaan & Beamish, 1988). However, conflict management involves the use of different conflict resolution strategies like problem-solving, compromising, forcing and legalistic strategy, and the choice of conflict resolution strategy in international joint ventures has performance implications (Lin &
Germain, 1998). In the coordination literature, arguments regarding how antecedents affect firm or alliance performance are often based on how conflict gets resolved, making conflict resolution a key aspect of coordination (Gulati & Nickerson, 2008; Krishnan, Martin & Noorderhaven, 2006; Zollo, Reuer, & Singh, 2002; Mohr & Spekman, 1994; Zaheer, McEvily & Perrone, 1998).

**Relating mechanisms and aspects of coordination**

To develop a more comprehensive view of work coordination it is essential to consider both mechanisms of coordination and aspects of work coordination. While the aspects of coordination identify *where* coordination is done and *what* is being coordinated, the mechanisms of coordination identify *how* coordination is carried out. This makes the mechanisms of coordination, identified earlier as use of structuring, use of boundary objects, or use of common ground, to lie orthogonal to the aspects of work tasks requiring coordination, such that each of the mechanisms of coordination can bring out coordination in each of the aspects of coordination through different mechanisms or pathways. This conceptualization leads us to a 3 X 4 matrix, presented in Table 7-1.

The table identifies the theoretical pathways through which mechanisms and aspects of coordination are related. These twelve distinct pathways, which relate the three mechanisms of coordination to the four aspects of coordination, are next elaborated.

The structuring of work by the use of mechanisms like contracts, modularity, task specification, standardization and organizational design, bring about role allocations between the coordinating agencies to affect the different aspects of work requiring coordination. At the same time, elements of structuring generate monitoring and control
in relationships by bringing about accountability and specifying the incentives and punishments for the agencies involved. They also enable decision-making by choosing who will make decisions and if required forcing consensus. Further, structuring enables information exchange by bringing in visibility about one another’s work and laying the standards for formal information exchange in the relationship, and also reduces conflict by reducing the degree of ambiguity and increasing the clarity of roles and responsibilities.

The use of boundary objects, such as schedules, plans, joint review, and joint-statements, bring about sequencing and interfacing and hence affect the different aspects of work. Also, the use of boundary objects enables monitoring and control in relationships by generating predictability and agreement between the agencies (Okhuysen & Bechky, 2009), and also specifying the targets to be achieved and the implications of failure. Further, boundary objects enable decision-making by specifying when decisions need to be made by clearly defining and sequencing the work phases. They enable information exchange in relationships by specifying the frequency and content of communication and the use of communication protocols, such that the cognitive challenges faced by managers in assessing, storing and sharing information at the firms interface get mitigated (Kellogg, Orlikowski, & Yates, 2006). Boundary objects also reduce conflict in relationships by specifying the hand-off stages, and if conflicts do arise, they guide the choice of actions for conflict resolution.

The use of common ground, such as common understanding, common knowledge, common culture, common identity, norms, and expectations, brings in shared understanding and flexibility between the coordinating partners, and this affects all of
the different aspects of work. At the same time, common ground reduces the need for monitoring by bringing in a common purpose and brings in control of the relationship through the social means like coercion and social pressure (DiMaggio & Powell, 1983). Common ground enables decision-making by helping each party understand the other's needs and motivating accommodation of the coordination partner. Also, common ground enables and eases exchange of information by building a common pool of information, establishing a common language for exchange, and decreasing the chances of conflicts in relationships by bringing familiarity. If conflicts do arise, common ground enables their resolution by making the coordinating agencies accommodate one another.

While suggesting the association of aspects and mechanisms of coordination, it is recognized that the existing literature, through providing guiding arguments, often emerges as an impediment, as it does not explicitly distinguish between the different aspects of work. For instance, while examining the link between a firm's experience and performance and emphasizing the importance of different kinds of routines, Zollo, Reuer, & Singh (2002, pg 709) state: "These routines may contribute to the performance of the alliance by facilitating the information gathering, communication, decision making conflict resolution, and the overall governance of the collaborative process." Hence, these authors fail to distinguish between the different aspects of work.

Furthermore, the existing literature also argues for cross-linkages between the different aspects and mechanisms of coordination, as is evident from the remark by Zaheer, McEvily, & Perrone (1998, pg 154-155), while examining the nature of trust performance relationship: " Nonetheless, . . . we note that eased negotiations and
reduced conflict resulting from interorganizational trust may in fact be an enabling conditions allowing exchange partners to pursue a variety of bilateral governance mechanisms such as exchange of personnel and shared decision making that lead to improved performance”.

**The PPP Context**

In Chapter 3, the distinctive aspects of PPP working were attributed to the presence of the government as an alliance partner and the delivery of public infrastructure. The presence of the government as an alliance partner in PPPs affects PPP working as the government has different objective functions, has a different source of sustenance, possesses asymmetric authority, and has greater credibility and legitimacy, besides the government managers holding a different risk aptitude. At the same time, the delivery of public infrastructure molds PPP working, as PPPs involve lumpy, indivisible, and long-term investments, possess toll good and monopolistic characteristics, and possess positive and negative externalities. PPP working accordingly gets structured in ways different from B2B alliances (Rufin & Rivera-Santos, 2010), and also possesses distinctive emergent aspects. For structuring, PPPs use a common objective, an SPV, and an IC, all of which guide how work gets coordinated. From an emergent perspective, PPP working is molded by the dominant line of business experience possessed by the private firm managing the concession agreement, and the experience of the managers that the private firm deploys to the project. While Chapter 3 elaborated on how the distinctive structuring of a PPP takes place, the empirical study focuses on the emergent ways of coordination in PPPs. The distinctive aspects of PPP structuring and the empirical findings are next discussed in the context of PPP working.
Structuring and Working of PPPs

In the Indian highway sector in particular, and contractual concessions in general (Marques & Berg, 2010), a common objective, an Independent Consultant (IC) and a special purpose vehicles (SPV) are identified as the distinctive structuring mechanisms used, in addition to the use of contracts and structuring of work. The common objective provides both a unifying concept to guide work and a common platform for work to be carried out (Mahoney, McGahan, and Pitelis, 2009). The IC, on the other hand, monitors the work on behalf of the public in general and the government in particular, and while bringing in flexibility in how work gets coordinated, provides the first stage for conflict resolution. Distinctive to the PPP context, and different from B2B alliances, the IC plays an active role as a project intermediary between the two primary coordinating agencies (government and private firm). That is, it is not there to manage exceptions when they arise, but rather actively participates in the project, such that the IC has an important set of roles and responsibilities to fulfill even in a project functioning normally.

The SPV localizes and contains the coordination of work in PPPs, and also provides a communicative framework (Koschmann, Kuhn, & Pfarrer, forthcoming), which can deliver value in the distinctive context of PPPs. It carries out coordination by bringing proximity between the coordinating agencies and reducing elements of work ambiguity (Okhuysen & Bechky, 2009). The two distinctive aspects of PPP working which are, i) the presence of the government as an alliance partner and ii) the delivery of public infrastructure, get addressed both by the presence of the SPV and its working. It is the separate legal entity of the SPV, and its serving as a hub to the interfaces between the different stakeholders of the project (i.e., government, consultants, parent firm, end users, financing agencies, and the construction contractors, Ref Figure 3-1),
that enables the SPV to address the distinctive aspects of a PPP while constructing a public infrastructure.

The empirical study finds that while the SPV serves to localize and contain coordination, it also introduces a distance between the parent firm and the work in the project. This distance significantly affects how work is carried out, as it makes the managers with high firm tenure reduce the use of common ground for coordination.

**Role of Firm’s Focus**

In PPPs, the private firm assumes a large bundle of project risks and makes large and lumpy front-end investments in the project. For this, the firm has to possess some unique capabilities, like availability of significant amounts of cash, proven worth in efficiently managing cash flows in a construction project, and a long term focus, all of which enable the firm to not only seek additional debt and equity finances from the market, but also to manage the project over the long concession period to achieve the desired rate of returns. At the same time, the private firm also needs to coordinate work with the government, which is philosophically a different identify, along with a large number of project stakeholders. Firms differ in the extent to which they possess these capabilities, and Chapter 4 identifies these capabilities to lie in the experience focus of the firm (i.e., highway or PPP focus). The highway focus of a firm reflects the degree to which the firm possesses a developed set of highway specific boundary objects (HSBOs) and understands the distinctiveness of working with out-sourced government contracts. On the other hand, the PPP focus of a firm makes the firm recognize the distinctive aspects of PPP working, which lie in the need for long term focus and the need for transparency in working. The empirical study has investigated how these foci mold the firm's use of coordination mechanisms in the project. While no significant
effects of a firm’s PPP focus were found, the highway focus of the firm was found to be positively associated with the emphasis placed on the use of boundary objects for coordination.

These findings can also be interpreted in the broader context of PPPs. The government chooses private sector partners in PPPs based on the expertise in construction that they possess. Accordingly, it expects the private construction firm to make significant technical contributions to the project. While in the conventional buying of construction services, the private construction agencies only shoulder construction risks, in PPPs they are also required to take on the design risks. To be able to assume this bundle of both construction and design risks, the need for the private firm to demonstrate its technical capability in the focal sector gets emphasized. The focus of the firm on the highway business reflects the technical capability that the firm possesses in designing, constructing, and operating highway projects, in an unambiguous and clear fashion. That is, when the firm’s dominant line of business is highway construction, it build up its own unique ways of working in the sector, some of which involve creating firm specific scheduling and planning practices, adopting sector-specific practices across the firm, and recognizing the idiosyncrasies of the sector and giving them their due. The empirical results support these contentions, and we find a firm’s highway focus to be a significant predictor of the use of boundary objects in projects.

Interpreting the findings in the context of the Indian highway sector, we find that while a large variation exists in the focus of the firms participating in the PPP highway projects in India, firms with a dominant highway business line add distinctiveness to how the project is worked. Highway sector being a growth sector for the Indian economy,
firms look upon the sector as an opportunity to grow with the economy, hence besides the incumbents in the industry there are also a large number of new entrants (Bandyopadhyay, Swaminathan, & Rohatgi, 2008). These new entrants play an important role in the sector by sustaining the high growth rate of the sector and the Indian economy (Press Information Bureau of India, 2011), these new entrants play an important role in the sector. More broadly, this study finds that the incumbents and new entrants work the highway projects in different ways, and these differences require attention from the other agencies coordinating in the project.

**Role of Manager’s Experience**

While the organizational literature has long recognized the need to view the manager as being boundedly rational (Simon, 1945), such a need has also been felt in public policy literature, and more so when new forms of public organizations are being studied (Ostrom, 2009). PPPs are one such new form of public organization, wherein the activities traditionally performed by the government are now being increasingly carried out at the private-public interface. Hence, this study contributes to the public policy literature, both as it studies the working at the government’s interface, and also as it studies how a boundedly rational manager affects this working.

More specifically, the empirical study finds that different kinds of managerial experience have different effects. While this is well recognized in managerial practice, this study operationalizes the arguments in practice and with the growing use of PPPs as an organizational from, identifies a manager's PPP experience of a manager as a different and distinctive experience set. That is, empirically we find that while highway experience and PPP experience possess differences. They are similar in that both expose a manager to the government’s way of working and require him/her to
coordinate with government managers, who are risk averse, but who possess significantly higher levels of authority, credibility, and legitimacy. However, PPP experience is distinct from highway experience as it also involves the recognition of the distinctive ways of PPP working, where transparency in working and the need to use procedures that leave a trail are very important. The study also identifies the mechanism by which managerial experience molds the work, as the differential emphasis that they place on the use of different coordination mechanisms.

The other kind of managerial experience examined in this study is the length of a manager’s tenure with the firm. As PPPs involve a major departure from arms length contracts, and require firms to take on significant risks, make long term investments, and also expose the firm to significant externalities, the extent to which the manager identifies with the firm affects the actions taken by the manager to protect and watch over the firm’s long term interest. We do find support for these arguments when we find the manager’s firm tenure to significantly moderate the firm’s PPP experience.

To interpret the findings in the context of the Indian highway sector, it needs to be recognized that the sector, is not only witnessing a changing profile of the firms participating in the sector, but also in the locally available pool of managers with relevant domain experience. The supplementary and complementary effects of managerial experience on the firm’s highway focus reflect how experience deficiencies at the firm level can be addressed by deployment of manager’s with relevant domain experience.

Interpreting the above findings in light of the null findings of moderation of the firm’s PPP focus effects by the manager’s highway experience, leads us to believe that
firm and managerial experience are very different in their effects. That is, the reciprocal effects of the firm’s focus and manager’s experience do not exist: while the manager’s PPP experience supplements and complements the firm’s highway experience, the manager’s highway experience does not mold the firm’s PPP experience effects.
<table>
<thead>
<tr>
<th>Mechanisms of coordination</th>
<th>Aspects of coordination --- Coordination in doing what (face of coordination)</th>
<th>Conflict resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structure</td>
<td>(HOW) Accountability; incentive/punishments</td>
<td>(HOW) Reduce ambiguity; bring clarity of rules and regulations; arbitration mechanisms.</td>
</tr>
<tr>
<td>Standardizing and structuring of work and organizations, Like, hierarchy, departmentalization, contract, roles, and responsibilities</td>
<td>(HOW) Authority (who will make decisions); forcing consensus</td>
<td></td>
</tr>
<tr>
<td>Plan</td>
<td>(HOW) Predictability; agreement; target specification; incentives</td>
<td>(HOW) Specify frequency; content of communication; uniformity of understanding between parties; uniformization of communication.</td>
</tr>
<tr>
<td>Programming and planning</td>
<td>(HOW) When decisions need to be made; guide options</td>
<td>(HOW) Provide choices</td>
</tr>
<tr>
<td>Sharedeness</td>
<td>(HOW) Common purpose; social pressure; coercion</td>
<td>(HOW) Accommodation; familiarity</td>
</tr>
<tr>
<td>Shared characteristics, flexibility, common culture/ norms/ identity/ expectation</td>
<td>(HOW) Understanding others needs (creating empathy)</td>
<td>(HOW) Acceptance; familiarity</td>
</tr>
</tbody>
</table>

**Elements of sharedness**

Elements of sharedness reduce need for monitoring by bringing in a common purpose and further control the relationship through the social means like coercion and social pressure.

Elements of sharedness help decision making by bringing about an understanding of others needs and by making parties flexible to each others needs.

Elements of sharedness enable information processing by building a common pool of information and establishing a common language for exchange. Ease communication.

Elements of sharedness decrease the chances of conflict in relationships by bringing familiarity. When conflicts do arise they see to resolve them by making agencies accommodative to the others needs.
CHAPTER 8
CONCLUSIONS

Summary of Findings

This study finds that the coordination of work at an organization’s boundaries can be carried out using different coordination mechanisms, and both the firm’s dominant line of business (i.e., firm’s focus), and the managers that it deploys to manage this work, mold the emphasis placed on the use of these mechanisms. While working for a firm with a greater highway focus, managers with a greater experience in the emerging forms of work (i.e., PPP experience), tend to amplify the use of the purposive boundary objects, and these same managers also amplify the use of common ground for carrying out the work, albeit for different reasons. A manager with greater PPP experience emphasizes the use of highway-specific practices, which are made available by the highway-focused firm, recognizing that they increase transparency and leave a trail behind; the same manager emphasizes the use of common ground, as he/she compensates for the highway-focused firm’s lack of understanding of PPP working, recognizing that it is important to address its distinctive characteristics.

This study also finds that when the firm’s dominant line of business is a new way of working (i.e., PPP working), the managers who possess a longer tenure with the firm tend to deemphasize the use of common ground. Managers are likely to behave in this way because they increasingly realize that the firm now has a long-term focus on the work and recognize that a distance exists between the firm and project-level work; the distance increases when work is located and contained in the distinct entity of SPV. This necessitates that the manager no longer emphasize short-term and spontaneous
mechanisms of coordination, which lack transparency, leave no trail, and the use of which may in the long term lead to a compromise of the firm’s interests.

Limitations and Future Directions

The small sample size of the empirical analysis is a key limitation of this study, and to address this limitation, another round of survey is proposed. Considering that we have achieved a respectable coverage of 25% (45 of the 176 PPP highway projects in the country have been covered), a second survey in the same sample domain is unlikely to significantly increase the sample size. Fortunately, with the growing use of the PPP model to execute highway projects in India, the number of projects that constitute the study’s sampling frame is ever increasing. Hence, running the second round of survey after a significant time gap is likely to increase the number of projects that can be included in our sampling frame. At the same time, a few other options for expanding the sampling frame also exist. First, while this study has been conducted in the context of PPP highway projects in the construction phase, we can also possibly include PPP highway projects in the operations phase. Secondly, we may include PPP projects in other infrastructure domains such as airports, seaports, water supply, sewage, etc., taking care to only include PPP projects that have been modeled in ways similar to those in the highway sector, such as contractual PPPs involving long-term concessions (Marques & Berg, 2010).

When work is performed jointly, as in our context, the task characteristics mold the use of coordination mechanisms (Thompson, 1967). Here, while studying the other antecedents to the use of coordination mechanisms, we control for some task characteristics (i.e., the quality of the DPR), the extent of land acquisition at the beginning of the project, and the amount of coordination existing in the project. Existing
studies of alliance working, like Carson, Madhok, Varman & John (2003), White & Lui (2005), and Robson, Katsikeas, & Bello (2008), have found the project value, a proxy measure of project complexity, to be a significant antecedent of how coordination is carried out. In the sample studied, firm value, project cost, and project length are significantly correlated at 0.48. Hence, while we do not specifically control for project value, we indirectly control its effects by controlling for a firm’s experience.

The empirical analysis testing for the effects of the antecedents of the coordination mechanisms was run on a unique sample of PPP projects. Herein, if the government selects firms for undertaking PPP projects based on the coordination mechanisms that they use, it could potentially bias the results due to sample selection. In the context of PPP firm selection, it needs to be recognized that government procurements of such kinds, are not affected by the shadow of the past or a shadow of the future (Henisz & Levitt, 2009), and further the selection of private firms for taking up a work of public importance is strictly guided by an elaborately laid out and quantitative financial and technical parameters (Wang & Bunn, 2004). Thus, preselection of the private firm based on the coordination practices that the firm uses is unlikely to be of concern in the sample. Also, aspects such as the use of coordination mechanisms are more emergent and qualitative in nature, and the government procurement evaluations are unlikely to consider them. Further, we have no evidence of any such sample selection. There exists a large variance in the experience of the private firms in the sample (mean = 11.97, s.d. 15.77), indicating that our sample included firms that possessed very different characteristics. Nevertheless, the analysis statistically controlled for the extent of the firm’s experience, as a proxy of the firm’s characteristics.
Another possible source of sampling bias could lie in the selection of managers by the firms. That is, firms may preselect managers who tend to use specific kinds of coordination mechanisms. While we have no way for controlling for this bias in the study, it nevertheless contributes to the recruitment literature by finding evidence that managerial experience, one of the important parameters based on which managers get recruited, differently affects the emphasis that managers place on the use of different coordination mechanisms.

While the above are some of the likely sources that could have biased our results, we feel that our findings lie on the conservative side. The highway PPP projects that we study are structured using very similar model concession agreements.¹ These contracts not only structure the projects in a very similar fashion, but they also guide the use of coordination mechanisms in the projects. For instance, in the context of highway PPP projects the model concession agreement not only specifies the roles and responsibilities of the parties and the incentives and penalties for not fulfilling them, but it also specifies that monthly progress reports need be prepared, and the project must be weekly inspected by the IC (Chapter XIV, Model Concession agreement). Further, it states that written records of disputes need to be kept and that disputes need be first resolved amicably by the affected parties; only if resolution fails should the IC intervene or the case be taken up for arbitration (Chapter XXXIX, Model Concession agreement). These clauses in the contract reduce the options that agencies have in working in the project, and hence restrain the choice of coordination mechanism. While we have no reason to believe that these restrains would differently affect the use of different

¹ The model concession agreement that guides all PPP highway construction projects in India can be downloaded from http://www.nhai.org.
coordination mechanisms, we do feel that they reduce the variance in the studied dependent variables, making the results more conservative.

To study how managers affect the project working, this study models the manager’s competencies in terms of the experience that he/she possesses. However, a manager’s experience is only one kind of functional competency, with others being education, business knowledge, and line/staff skills (Spekman, Isabella, & MacAvoy, 2000). Besides functional aspects, the competencies of an alliance manager also lie in earned competencies, like credibility, respect, and interpersonal networks, as well as interpersonal competencies, like social skills, communication skills, and cross cultural awareness (Spekman, Isabella, & MacAvoy, 2000). Further, while working at the firm’s boundaries, the manager’s personality traits, like open-mindedness, flexibility, self-confidence, sensitivity, and drive to achieve, are also important (Child & Faulker, 1998). Hence, a need exists for future studies exploring the role of managers in carrying out coordination in order to study the effects of these characteristics, such as earned and interpersonal competencies, personality traits and psychological attributes.

Similarly, while this study examines the effect of a firm’s focus on coordination of work, a potentially rich research ground exists wherein the effects of the different characteristics of the firm, like extent of diversification, kind of organization (line/staff, matrix, project based, organic), nature of ownership, kind of leadership, etc., may be studied.

Lastly, PPP are an emerging way of working, and not only have many different practical manifestations of PPPs emerged (i.e., BOLT, BOT, DBOF, annuity, toll, negative or positive grant), but they have also taken different conceptual forms. For
instance, Marques & Berg (2010) identify institutional and contractual PPPs as two different conceptual forms of PPPs, and study how risk is differently allocated in each. Similarly, Kivleniece & Quélin (forthcoming) identify two ideal types of public-private tie governance (autonomous and integrative), and argue that they differ in both the rationale for which partnerships are made and also in how they create value. At the same time, it has been recognized that the conceptual differences between the different forms of PPPs are not only limited to the allocation of partners between risks, but they also extend to how work is performed within them (Bult-Spiering & Dewulf, 2006), and hence mold coordination of work. To ensure empirical homogeneity in the sample, this study focused on PPPs that shared a structural form, hence the sample frame was defined as PPPs in the Indian highway sector. Future studies are required to examine the coordination of work in the many different forms that PPPs have taken.

Implications for Managers

There is a vast and growing body of literature studying PPPs. Found in economic, financial, and public policy domains, this literature seeks to understand the rationale, structuring, and benefits of PPPs. While this literature is very valuable for making policy decisions, it provides little guidance to managers on how to manage PPPs once they have been created. The distinctive nature of PPPs makes the study of PPP management all the more important, as PPPs entail a new context in which public-private interactions take place. Also, the evaluation of PPP performance can be highly ambiguous, as its performance implies different things to different stakeholders (Hodge & Greve, 2010). Accordingly, this research focuses on the process of PPP working, and

\(^2\) For instance, the International Handbook of PPPs has been published in 2011, aggregating findings from different domains and contexts, and it is the first publication of its kind (Hodge, Greve, & Boardman, 2011).
studies the antecedents of the intermediate aspects of work (i.e., use of coordination mechanisms to carry out the work).

This study provides evidence that although the ex-ante contract guides how work is performed, coordination mechanisms are used and emphasized differently, which has implications for managers. Also, while the parent firm molds the work context, the managers who deploy coordination mechanisms significantly moderate the firm’s actions. More specifically, this study finds that a manager’s experience can play an important role in how coordination is carried out, and different kinds of experience can differently mold how work is done. The manager’s PPP experience was found to consistently moderate the effects of a firm’s technical domain focus (highway focus), implying that a manager’s PPP experience may complement or supplement the firm’s experience in the technical domain. This is an important finding in the context of the Indian highway sector, which is growing at a very fast pace, and firms need time to gain experience in managing the distinctive way of PPP working. The deployment of managers with greater PPP experience can enable firms with lesser PPP experience, but high highway experience, to jump the experience curve and carry out coordination in ways similar to that carried out by firms possessing more PPP experience. Accordingly, the findings of this study can guide firms in hiring managers for working in this new and emerging sector.

Further, this study identifies the distinctive aspects of PPP structuring as the use of common objective functions, SPV, and IC, and finds SPVs to uniquely mold how work is carried out. It was found that SPVs, while locating and containing coordination, also create a distance between the firm and actual working of the project. This distance is
not inconsequential, and affects how managers recognize that distance and adapt their working, while being guided in their actions by the firm’s experience. While protecting the firm’s interests, managers with a high firm tenure deemphasize the use of spontaneous coordination mechanisms, which may bring in adhocracy. This finding at first seems to be contradictory to managerial thought, as managers with experience and tenure are expected to use greater amount of trust to get work done. These unexpected findings can be explained by recognizing that trust comes from both a shadow of the past and a shadow of the future, and PPP working is unique in its requirements of transparency, use of SPV, as well as its need for trail leaving actions. It is pertinent to note that these findings were quite robust across all tested models.

Hence, the study finds that managers recognize the distinctive nature of PPP working and adapt their work in PPPs accordingly.

**Location in Current Thought and Final Words**

This dissertation contributes to existing literature by deepening our understanding of how work is coordinated in an emerging context of public-private interactions, while recognizing the existence of boundedly rational managers (Simon, 1945). This is in contrast to the literature in both organizational theory and public policy, which studies work cooperation while emphasizing the role of motivation. While contributing to these literatures, this study is also located in recent thought that has emerged in both of these domains.

In the public policy domain, while summarizing the current theoretical developments in the governance of complex economic systems, Nobel Laureate Elinor Ostrom remarks in her Nobel Prize winning lecture:
As illustrated . . . the updated theoretical assumptions of learning and norm-adopting individuals can be used as the foundation for understanding how individuals may gain increased levels of trust in others, leading to more cooperation and higher benefits with feedback mechanisms that reinforce positive or negative learning. (Elinor Ostrom, Prize lecture December 8, 2009, pg 432).

This research can be seen as an instantiation of the above argument, where by departing from the rational choice assumptions about individuals, we study how coordination is achieved in complex economic systems, like PPPs, while accounting for the manager’s learning.

There exists a need for developing a more comprehensive understanding of work coordination, as work is increasingly organized in new ways both within and between organizations (Barley & Kunda, 2001; McEvily, Perrone, & Zaheer, 2003; Sinha & Van de Ven, 2005). At the same time, the study of value creation in PPPs is a current and emergent research theme for organizational theorists (Strategy Research Foundation, 2011). This study lies at the intersection of these, addressing the needs of both. Firstly, it attempts to develop a more comprehensive understanding of work coordination by recognizing the important role played by the individual in carrying out coordination, proposing a theory driven categorization of coordination mechanisms, and developing the coordination perspective by distinguishing mechanisms and aspects of coordination. Secondly, it studies the working of PPPs, of which we have little understanding, despite the large body of PPP literature. Hence, this study is located in current themes of research, while contribute to the existing literature.
APPENDIX
SURVEY FORM

Survey of the Modes of Coordination used in Large Construction Projects

Dear Sir,

I am an Indian Railways Mechanical Engineer on study leave, pursuing a Ph.D. in Management at the University of Florida, US. As part of my dissertation I propose to study how coordination is done in large organizations and projects. For this purpose I have prepared a survey form that I propose to use to survey the top managers who are involved with the highway construction projects in India. More specifically, the survey proposes to gather insights from the different agencies involved (who are coordinating the work) in such projects (i.e. Project Director (NHAI), Project Manager (Concessionaire), Team Leader (Independent Consultant) and the Corporate Officer (Concessionaire Corporate Interface Unit)).

I have identified successfully running or completed projects from various sources, and your project is one such project. As you are heading your project and working in one of the roles above, I seek your help and request you to kindly spare 20 mins and complete the following survey for my study. The survey seeks to measure your perceptions about your and your colleagues work, and IS NOT about performance of the project or about any disputes or issues. Further, only the researchers involved in the study will have access to your responses. Your responses will not be shared with the other participants in the study or your colleagues in the industry.

As an industry professional and colleague, I seek your cooperation and help in completing this academic research project.

Thanks,

Swapnil Garg

You can also take this survey online at:
http://edu.surveygizmo.com/s3/406546/Coordination-Survey-A

Project Name:
Name: Designation:
Contact Phone: Email Id:
Part A: Project Level Working

Kindly name the different agencies involved in the project:

Client: ........................................................................................................ ........................................
PIU Name: ........................................................................................................ ........................................

Concessionaire (Bidder): ........................................................................................................ ........................................
Name of Parent Firm: ........................................................................................................ ........................................
Consultant: ........................................................................................................ ........................................
Name of Consultant: ........................................................................................................ ........................................

Using the legend as below, kindly tick your response

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<tr>
<th></th>
<th>Not at all</th>
<th>Low</th>
<th>Moderate</th>
<th>High</th>
<th>Very High</th>
</tr>
</thead>
</table>

To what extent do the agencies **(Client, Concessionaire & Consultant)** coordinate in
1. .... a smooth manner in work matters? ................................. 1 2 3 4 5
2. .... a cordial way? (e.g., easy interfacing and integration of the work of different agencies) ................................. 1 2 3 4 5
3. .... making changes to project to accommodate unforeseen circumstances? ................................. 1 2 3 4 5

The first set of questions (4-18) refers to the role that the contract plays.

To what extent does the **CONTRACT** ....
4. .... specify role of agencies **(Client, Concessionaire and Consultant)**? ................................. 1 2 3 4 5
5. .... specify responsibilities of agencies? ................................. 1 2 3 4 5
6. .... specify targets to be completed? ................................. 1 2 3 4 5
7. .... specify terms for monitoring the major activities (e.g., L-1 Schedules, budget )? ................................. 1 2 3 4 5
8. .... specify penalties (e.g. time and cost) to agencies for not meeting contractual commitments? ................................. 1 2 3 4 5
9. .... specify benefits (e.g. time and cost) to agencies for fulfilling contractual commitments? ................................. 1 2 3 4 5
10. .... specify project decisions need to be taken by one agency (e.g., decisions about scope changes) ................................. 1 2 3 4 5
11. .... require the 3 agencies to give formal approval on all joint decisions? ................................. 1 2 3 4 5
12. .... force joint decision making by agencies **(Client, Concessionaire and Consultant)**? ................................. 1 2 3 4 5
13. .... specify the frequency of project meetings among agencies? ................................. 1 2 3 4 5
14. .... specify format of formal reports to be used? (e.g., monthly reports, progress reports) ................................. 1 2 3 4 5
15. .... guide which agencies formally exchange information with whom? ................................. 1 2 3 4 5
16. .... enable dispute resolution by making the role of agencies clear & unambiguous? ................................. 1 2 3 4 5
17. .... enable dispute resolution by making responsibilities of agencies clear & unambiguous? ................................. 1 2 3 4 5
18. .... specify methods of dispute resolution between the units? ................................. 1 2 3 4 5
The second set of questions (19-35) refers to the role that the planning plays in the relationship
To what extent has the SCHEDULING/PLANNING....

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<tr>
<td>19.</td>
<td>.... been done in consultation with other agencies? (Client, Concessionaire and Consultant)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
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<td>20.</td>
<td>.... been agreed upon by the different agencies? (e.g., agreeing on detailed method of construction)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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<tr>
<td>21.</td>
<td>.... specified operational targets? (e.g., activities on critical path which are to be monitored, and day to day work schedules)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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<td>22.</td>
<td>.... specified operational rules and procedures? (e.g., procedure for tests, inspection, approvals)</td>
<td>1</td>
<td>2</td>
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<td>4</td>
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<tr>
<td>23.</td>
<td>.... specified involvement of different agencies? (e.g., identify the human resources, material, and equipment to be provided by each agency)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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<tr>
<td>24.</td>
<td>.... specified the sequence in which the different activities are to be done by different agencies in the project? (e.g., preparation of Level 2 and Level 3 plans)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>25.</td>
<td>.... specified responsible agencies for each activity, to enable monitoring of work? (e.g., clear delegation of work and regular follow-up of the work delegated to other agencies)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>26.</td>
<td>.... helped identify deviations (by agencies) from the agreed schedule? (e.g., specifying which activities to monitor on the critical path, and how this monitoring is to be done)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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<tr>
<td>27.</td>
<td>.... delineate decision making by specifying the interfaces among the agencies?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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<tr>
<td>28.</td>
<td>.... clearly define the aspects of hand off to enable decision making? (e.g., does planning help improve, alter or eliminate activities and allow for considering different more effective alternatives)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>29.</td>
<td>.... help decision making in smooth handoffs? (e.g., handover of land for construction to start or handover of finished work)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>30.</td>
<td>.... help information exchange by specifying the frequency of site reports or site visits?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>31.</td>
<td>.... help information exchange by the adoption of a procedure database &amp; common information system? (i.e., an organized means to communicate project information among the agencies)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>32.</td>
<td>.... specify the need for information exchange about schedule changes? (e.g., communicating plan and schedule changes to all agencies)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>33.</td>
<td>.... provide flexibility in work to resolve disputes? (e.g., allow for remedial work methods and programs for defect rectification)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>34.</td>
<td>.... get referred to for resolving disputes among agencies?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>35.</td>
<td>.... lead to reduced interference by agencies in others work?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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</table>
The third set of questions (36-54) refers to the role that the SOCIAL relationships play
To what extent do agencies (Client, Concessionaire & Consultant)..............
36. .... have a shared understanding (Client, Concessionaire & Consultant)? 1 2 3 4 5
37. .... have cultural similarities? 1 2 3 4 5
38. .... have shared identities (feeling of oneness or team spirit)? 1 2 3 4 5
39. .... have shared informal norms? 1 2 3 4 5
40. .... treat problems as joint rather than individual? 1 2 3 4 5
   .... shared purpose reduce need for monitoring? (e.g., common views of the agencies on time, cost, quality, and safety of the project, reduces the need for agencies to monitor one another.) 1 2 3 4 5
41. .... social expectations govern their behavior (Client, Concessionaire and Consultant)? 1 2 3 4 5
42. .... conformance to the shared identity (feeling of oneness or team spirit) lead to smooth working? 1 2 3 4 5
   .... deviations from the informal norms get looked down upon? 1 2 3 4 5
43. (e.g., if norms are not followed then others agencies try to discipline and ensure that the norms are followed) .... accommodate other agencies’ needs in taking project decisions? (e.g., facilitating timely payments to sub contractors and employees) 1 2 3 4 5
44. .... voluntarily consult other agencies to decide project issues? 1 2 3 4 5
45. .... communicate decisions on-phone? 1 2 3 4 5
46. .... easily negotiate scope changes? 1 2 3 4 5
47. .... employees meet outside office? 1 2 3 4 5
48. .... employees share non project information? 1 2 3 4 5
   .... employees comfortably share project information? (e.g., are agencies comfortable in explaining and supporting the work of specialized suppliers) 1 2 3 4 5
49. .... adapt to other agencies way of working? (e.g., change their working procedures to help others work better) 1 2 3 4 5
50. .... employees personal rapports help resolve project issues? 1 2 3 4 5
51. .... employees go out of their way to resolve project issues? 1 2 3 4 5

Part B– Project Information

DIRECTIONS: Kindly provide the following information about the project

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<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Not at all</td>
<td>Low</td>
<td>Moderate</td>
<td>High</td>
<td>Very High</td>
</tr>
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</table>

1. This project has had SERIOUS problems, i.e., law and 1 2 3 4 5
2. This project has had SERIOUS problems with the 1 2 3 4 5
3. The quality of the DPR for this project was (1 is Bad, 5 Excellent)

4. The scope of the project has increased by ______ % since start

5. The land acquisition at the start of the Project was ______ % Complete

6. At this stage the progress of this project
   (a) ______ % Financially
   (b) ______ % Physically

7. The project by this time SHOULD have been (As per original plan)
   (a) ______ % Financially Complete
   (b) ______ % Physically Complete

8. The procurement of material for this project is
   (1) Centralized with Concessionaire
   (2) Centralized at Project
   (3) Locally procured as required

9. The Machinery & Plant of the Project is
   (1) Centralized with Concessionaire
   (2) Centralized at Project
   (3) Hired Locally as required

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<th>2</th>
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<tr>
<td>Strongly Disagree</td>
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<tr>
<td>Disagree</td>
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<tr>
<td>Neutral</td>
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<tr>
<td>Agree</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strongly Agree</td>
<td></td>
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1. The project is on the way to achieve its set goals
2. The time & effort spent by the agencies in developing the project
3. This project has not been progressing as we would have liked it
4. The project is characterized by a strong and harmonious
5. In this project, resources are deployed efficiently
6. Procedures and mechanisms used for project resource
   inputs into
7. The project is not effective in converting resource inputs into
8. The project can adapt quickly to environmental changes
9. The project agencies are able to make adjustments to project to cope with changing circumstances
10. Whenever some unexpected situation arises, the project
    management is capable of modifying the existing structure and strategies of the project
11. In the face of problems or special circumstances, managers
    cannot adjust the project as required.

Part C: Individual

DIRECTIONS: In this section please tell us something about yourself.

1. Your Age ______ years
2. Highest Educational Qualification
   (Tick as Applicable)
   (1) Diploma Engineering
   (2) Bachelor's Engineering
   (3) Post Graduate Degree (Technology)
   (4) Post Graduate Degree (Management)
   (5) Other .............................................
3. Your Professional Qualifications (Tick as Applicable)
   ① Project Management professional (PMP)
   ② ISO Auditor / Quality Professional
   ③ Other Technical Qualification

4. How many professional development courses (Technical) have you attended in the last 5 years?
   (e.g., Highway Construction, Highway Design)
   ____________ No of Courses

5. How many professional development courses (Management) have you attended in the last 5 years?
   (e.g., Construction Management, Leadership)
   ____________ No of Courses

6. Your Total Highway Construction Experience
   ________ No of Projects, ________ No of Years, ________ Km’s of Highways Built

7. Your Total International Experience
   ________ No of Projects, ________ No of Years, ________ Km’s of Highways, ______ No. of Countries

8. Have you been in this role since the beginning of this project?
   ① YES, since when_________  ② NO

9. When did you join your parent firm (most recently)?
   ________ Year

10. How long have you worked in the corporate office of your parent firm?
    ____________ No of Years

11. Were you involved with the initial project structuring (Making of packages of work)?
    ① YES  ② NO

Part D: Other

Other Issues that you faced during the implementation of this project

1.  
2.  
3.  
4.  
5.  

Thanks a lot for sparing your valuable time to take this survey.


India Infrastructure Research. 2010. *Road development of India Vol I & Vol II* India Infrastructure publishing.


Thelen, K. A. 2004. *How institutions evolve: The political economy of skills in Germany, Britain, the United States, and Japan* Cambridge University Press.


BIOGRAPHICAL SKETCH

Swapnil Garg is a railway mechanical engineer who is comfortable working at the interface of academia and industry. At the early age of 18, he was selected by the Indian government to be part of the Special Class Railway Apprentice undergraduate program, which has an acceptance rate of less than 0.1%. Here he was trained to be a mechanical engineer and groomed to be an officer-gentleman at the prestigious Jamalpur Gymkhana and Indian Railways Institute of Mechanical and Electrical Engineers in Bihar, India. During this program, Swapnil also earned credentials in mechanical, electrical, and electronics engineering from IMechE (UK) and the Institution of Engineers (India). Upon graduation, Swapnil served with the Northern Railway in a Mechanical Engineering role in four divisions. During this period, he was head of various operational divisions and maintenance sheds and gained experience in a variety of roles.

In the year 2000, Swapnil was selected for the Executive MBA program, called National Management Program, at the Management Development Institute in Gurgaon, India. Herein, individuals from the public and private sectors join a residential program sponsored by the Indian government common program and interact with one another for a 15-month period to develop a deeper understanding of the how the two sectors work interdependently. Due to his specialization in Information Systems Management in the MBA program, his interest shifted from engineering to management. Swapnil spent two years at Diesel Locomotive Works in Varanasi, India, piloting their nascent Enterprise Resource Planning project; he later spent four years at IRCON International Limited, India, managing their different IT initiatives that were adopted during this period, such
as the implementation of Enterprise Resource Planning (SAP) and the Project Management Information System.

Swapnil’s interests continued to evolve, and he found himself drawn to broader managerial practice and general management. With almost 20 years of techno-managerial experience in diverse industries (i.e., railroad, construction, and information systems), combined with his graduate level education, he became attracted to the academic underpinnings of managerial practices. Swapnil thereupon joined the Ph.D. Management program at the Warrington College of Business Administration in August of 2007, where he could conduct research in the area of management. His research interests have over time narrowed to strategic alliances, with a specific focus on partnerships at the public-private interface and the process of entrepreneurship. Upon completion of his Ph.D. from the University of Florida in 2012, Swapnil has returned to his job at Indian Railways.