

# THE PRIVATE SCOPE IN PUBLIC-PRIVATE COLLABORATIONS: AN INSTITUTIONAL AND CAPABILITY-BASED PERSPECTIVE

ORGANIZATION SCIENCE (forthcoming) \*\*

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## Abstract

There has been a growing interest in the organization of business activities at the public interface, as illustrated by the emergent phenomenon of public-private partnerships (PPPs). In this study, we analyze the determinants of private scope in partnering with public actors—i.e., the extent to which private actors are involved in multiple, consecutive value-creating activities in the partnership. Based on a unique dataset of public-private agreements worldwide over two decades, we find that institutional and capability-based determinants jointly affect the extent of private scope in public-private collaborations. Our results highlight the contingent role of the quality of institutional environment. Institutions not only facilitate greater private scope directly but also moderate the effect of public and private capabilities on private scope. We find that prior public experience in PPPs enhances private scope in settings with high-quality institutions, while having an opposing effect in low-quality environments. Moreover, public governance capabilities accumulated via units designed to deal with PPPs appear to substitute for the lack of high-quality institutions, suggesting that even under weak institutional settings, countries can foster high private scope with the creation of pockets of specialized public capabilities. In contrast, private capabilities in PPPs, expressed as firm engagement in recurring government co-funded projects, appear to have a complementary effect: they help to increase private scope in PPPs, but only when domestic institutions are of high quality. By highlighting the determinants of private actor involvement in public sector activities, our study offers important implications for the theory and practice of hybrid (cross-sector) organizational forms.

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AN INSTITUTIONAL AND CAPABILITY-BASED PERSPECTIVE**

**INTRODUCTION**

Public-private partnerships (PPPs) are becoming widely used by governments and municipalities to overcome public resource constraints and capitalize on the organizational capabilities and resources offered by private entrepreneurs (Cabral et al. 2013; Mahoney et al. 2009). In this context, private actors are responding to calls for an increased role in public-private projects by adjusting their extent of engagement in multiple, successive activities across the value chain of public products and services (Kwak et al. 2009). For example, Sodexo, one of the world's largest catering and facilities management companies, started its operations in incarceration service PPPs in France with a restricted focus on facilities management and subsequently expanded its scope to other functions such as construction, security, health, and inmate rehabilitation. From a public actor perspective, a broader scope of private participation in PPPs is increasingly sought as a means to alleviate public funding pressures and provide access to technologies, goods, and services of a higher quality and at potentially lower cost, thus enabling value creation through public-private collaboration (Rangan et al. 2006).

Understanding how private actors engage in PPPs is particularly important given the growing scholarly attention to these novel hybrid organizational forms (Barringer and Harrison 2000; Henisz 2006) and the marked differences of these collaboration forms from other, more traditional arrangements, such as private-private alliances and R&D partnerships. Unlike private sector hybrids, PPPs are conceived on predominantly non-market, public objectives and subject to extensive political influence (Bonardi et al. 2005; Kivleniece and Quélin 2012; Klein et al. 2010). These features create hazards in governing such alliances and magnify risks to private parties in terms of transaction-specific learning, investment, and value creation (Dixit 2002; Williamson 1999). In PPPs, public actors may act as direct partners of private firms, but also represent regulators and legislators with a distinct ability to alter the underlying "rules of the game," renegotiate contractual terms, and change the incentives to deploy new capabilities.

Yet, despite increasing attention to public-private hybrid forms in economics (Chong et al. 2006; Hart 2003), public administration (Bovaird 2004; Hodge and Greve 2007), and more recently, strategic management (Kivleniece and Quélin 2012; Mahoney et al. 2009; Rangan et al. 2006), we still know relatively little about the conditions that enable private actors to deploy an increasing extent of firm-specific resources and capabilities to large and complex projects at the public interface.

In this paper, we focus on explaining the determinants of *private scope*: the extent to which private actors are involved in a set of multiple, successive value-creating activities in PPPs. A number of theoretical strands have emerged in the recent studies on public-private interaction (McGahan et al. 2013) identifying relevant factors to understand private scope decisions in PPPs. These factors include contractual aspects of public-private interaction (Chong et al. 2006; Chong et al. 2015; Guasch et al. 2008; Hart et al. 1997), institutional factors affecting cross-country private investment (Henisz 2006; Henisz 2002), and the cumulative experience of actors in public-private collaboration (Cabral et al. 2013; Klein et al. 2013). However, while prior studies on private-public collaboration have highlighted the crucial role of institutional environment, particularly in infrastructure sectors (Fabrizio 2012; García-Canal and Guillén 2008; Henisz 2002; Zelner et al. 2009), relatively less attention has been paid to understanding the role of public and private organizational *capabilities* in public-private partnering, or to the interaction of such organizational capabilities with institutional factors influencing scope decisions.

To address this void, in this paper we examine how the interplay between organizational capabilities present in both public and private actors involved in PPPs and the quality of local institutional environments may affect the private scope in collaboration. We argue that capabilities and institutions, both directly and in interaction, are key determinants of private scope in public-private collaboration. We explore public and private capabilities in PPPs by focusing on two major attributes associated with capability development in public-private partnering: experience-based capabilities, related to accumulated organizational learning of how underlying partnerships may need to be functionally executed in order to achieve desired goals, and governance-based capabilities, which refer in this paper to abilities and structured efforts of public and private actors to create specialized organizational structures to mitigate contractual hazards and govern public-private collaboration to the

benefit of all transacting parties. In these terms, we dwell upon both prior partnership experience and dedicated PPP governance units (similar to “alliance functions” in the private sector) as important (yet not mutually exclusive) attributes to capability development in public-private partnering. We also assess how the effects of these capabilities change according to the institutional environment of the country, defined as the set of stable rules that increase transparency, efficiency, and regulatory commitment in the public sector (Henisz and Zelner 2005, 2006; North 1990). We then propose several hypotheses predicting not only the direct effects of public and private organizational capabilities on private scope in PPPs, but also the effect of the interaction between capabilities and the quality of the local institutional environment. Our hypotheses are tested using an original database covering more than a thousand PPP contracts, in ninety-six countries and nine different sectors, from 1992 to 2012.

Our results suggest that institutional environment affects private scope in PPPs directly and positively by modifying the perceived level of political and contractual hazards, and hence altering the likely extent of private actor engagement in public sector activities. We also demonstrate that the quality of the local institutions acts as a critical moderator of the influence of public and private capabilities on the private scope in PPPs. We notably find a complementary effect between the experience-based attributes of public capabilities and the institutional quality, suggesting that private actors are more likely to enhance their scope in PPPs in the presence of broader public actor experience when the quality of institutions is high. By contrast, public capabilities accumulated via specialized PPP governance units—i.e. centralized public sector entities created to design and govern public-private collaborations—appear to have a substitute effect in low-quality institutional environments, allowing private actors to enhance the private scope in such settings and potentially offset the hazards from underlying institutional weaknesses. We also find a direct effect of private capabilities in public-private collaboration on enhancing the private scope in public sector collaboration. More specifically, we find that a firm’s prior partnering ties with government actors (via creation of jointly funded vehicles specifically designed to govern the PPP) enhance the extent of private scope. Moreover, the higher the quality of institutional environment, the higher the effect of private capabilities accumulated via prior government partner relations—thus suggesting a complementary effect of private capabilities under the conditions of an enabling institutional environment.

By integrating insights on institutional and capability-based determinants of private scope in PPPs, we shed new light on both organizational- and institutional-level factors that are expected to shape private actor engagement in public interest areas. We demonstrate how scope decisions depend not only on transactional aspects affecting public-private collaboration (Hart 2003; Spiller 2010; Williamson 1999), but also on a set of private and public organizational capabilities that can be leveraged within the context of collaboration, and the interaction between these capabilities and the underlying institutional environment. Our results hence contribute to nascent studies on public-private hybrid arrangements (Mahoney et al. 2009; McGahan et al. 2013), which have highlighted the role of institutional setting (García-Canal and Guillén 2008; Henisz 2000b; Henisz and Zelner 2005) and organizational capabilities (Cabral et al. 2013), but rarely examined their more nuanced effects and *interaction* as crucial determinants of private investment and scope decisions (Fabrizio 2012). Moreover, with most existing studies being largely confined to examining the role of private sector capabilities, our work highlights the need to disentangle the effects of private *and* public sector capabilities, both being affected by the quality of the institutional environment. Conceptually, our results suggest the importance of considering the role of the institutional environment simultaneously with heterogeneous public and private organizational capabilities to understand the extent of private participation in PPPs.

Our paper is organized as follows: The first section discusses the theoretical arguments and proposes the hypotheses to be tested. The second section presents the data and sample. The third section discusses main findings, and the fourth and last concludes with implications for theory and practice, as well as suggestions for future research.

## **THEORY AND HYPOTHESES**

### **PPPs: A Distinct Form of Interorganizational Arrangement**

In the past few years, strategic management scholars have paid increasing attention to a spectrum of collaborative relations and modes of organizing across public and private sector boundaries (Kivleniece and Quélin 2012; Mahoney et al. 2009; Quélin et al. 2017; Rangan et al. 2006). Cross-sector collaboration involving governments, private entrepreneurs, and non-governmental organizations

(NGOs) has been increasingly recognized as a novel hybrid organizational phenomenon able to address a broad range of societal goals, such as healthcare, education, public infrastructure provision, and poverty alleviation (Rangan et al. 2006). Important insights have emerged, particularly from a management scholar perspective, on the influence of such novel forms of alliances in crafting innovative strategies to deliver goods and services in an economically viable and inclusive manner (George et al. 2012; Koschmann et al. 2012; Rangan et al. 2006). Empirically, innovative forms of cross-sector partnering have been observed in a number of sectors where public and private interests and capabilities intersect (Kwak et al. 2009; Mahoney et al. 2009; McGahan et al. 2013), such as transportation, energy, incarceration, and water and sanitation services (Barlow and Köberle-Gaiser 2008; Cabral et al. 2013; Chong et al. 2015). Crucially, from a theoretical perspective, PPPs have been acknowledged as collaboration distinct from more traditional alliances, joint ventures, and other types of interorganizational ties in purely private settings (Henisz 2006; Kivleniece and Quélin 2012; Rivera-Santos and Rufin 2010). Residing between the polar modes of public and private bureaus (Williamson, 1999: 335–336), PPPs are argued to feature higher-powered incentives than public bureaucracy but also higher administrative controls and probity concerns than private governance (Williamson 1999). Moreover, and crucially, the role of non-market objectives and political influence have been shown as particularly acute in these settings (Bonardi et al. 2005; Henisz 2002; Kivleniece and Quélin 2012; Klein et al. 2010).

In line with emerging literature, we posit that public-private collaboration represents a distinct hybrid phenomenon in which public actors play a dual role as both institutional “rule-setters” (North 1990) and direct contractual counterparts to private organizations. This dual role of public actors brings important differences to the underlying contracting and coordination mechanisms in PPPs compared to private-private settings—notably, higher contractual rigidity, weaker relational ties, and higher pressures for public accountability (Kivleniece et al. 2017; Moszoro and Spiller 2012; Rufin and Rivera-Santos 2010; Spiller 2010). Coupled with the need to conciliate the competing goals of external stakeholder groups and the difficulties of transposing private incentive-based schemes to the public sector (Dixit 2002), public-private hybrids thus stand apart from private sector alliances, and call for deeper inquiry into their governance mechanisms, scope, and firm boundary implications.

### **Private Scope in PPPs**

In this paper, we focus on the determinants of private scope in public-private collaborations, with the notion of the private scope referring to the extent to which private actors are investing and participating in multiple, successive (functional) activities along the collaborative project's value chain (Kwak et al. 2009). Specifically, the notion of private scope in PPPs considers the structure and division of resource allocation and production activities along the various stages of the value chain, and the associated interdependencies between different sets of activities (Jacobides, 2006). Private scope is understood to increase when private actors become increasingly involved in various sequential value-creating activities in the partnership, such as asset design, building, leasing, or subsequent operations. For example, in the emerging-market healthcare sector, the public-private engagement underlying the Queen Mamohato Memorial Hospital in Lesotho illustrates a collaboration with enlarged private scope. Conceived in 2006, this PPP involves a complex, eighteen-year contract, with an extensive capital investment (USD \$100 million, financed through public [38%] and private funds [62%]), in which private actors were tasked to design, build, finance, operate, and transfer to public authorities a new large-scale (425-bed) hospital and three filter clinics. The extensive scope of private actor engagement in this case is expected to lead to expanded access to services along with more efficient asset management and higher quality care (Vian et al. 2015).

### **Capabilities and Private Scope in PPPs**

In prior literature, private participation in PPPs has been predominantly studied through transaction cost economics (TCE) and incomplete contract theory (Brousseau and Saussier 2009; Chong et al. 2015; Hart et al. 1997; Hart 2003). According to these theoretical lenses, the asset-specific nature of the service under scrutiny, the degree of adverse effects from poor-quality provision, counterparty behavioural hazards, and probity concerns are the critical determinants that define and limit the extent of private scope in public service provision (Williamson 1999). Relatedly, contractual incompleteness has also been demonstrated to play a key role in shaping public sector boundaries (Hart et al. 1997; Hart 2003). From both TCE and contracting literature perspectives, the inability to specify a complete contract with private actors and the difficulties associated with dealing with misalignment between

public and private incentives generate contractual hazards and constrain increased private participation (Brousseau and Saussier 2009).

At the same time, in management studies, the notion of organizational capabilities (Barney 1991; Peteraf 1993; Teece et al. 1997; Winter 2003) has become an influential perspective to explain organizational boundary choices, along with transaction cost arguments (Argyres 1996; Argyres and Zenger 2012; Fabrizio 2012). Yet, deeper insights on the role of capability- and resource-based arguments have been scant in cross-sector (hybrid) and public organization studies (Piening 2013). We posit that an adequate application of capabilities-based arguments requires the examination of the peculiarities of both public and private organizational actors, and the spectrum of roles they can assume in public-private collaboration.

More specifically, considering the interdependence of public and private actors in public interest areas (Mahoney et al. 2009), in this paper we identify two distinct sets of capabilities that have a potential effect on private scope: *public capabilities* and *private capabilities in public-private collaboration*.<sup>1</sup> We define these capabilities as a set of well-established abilities of organizational actors, either public or private, to originate, develop, structure, govern, and execute public-private collaboration. From a theoretical perspective our notion of public and private capabilities in PPPs is based on the resource-based perspective on organizations (Barney 1991; Peteraf 1993; Wernerfelt 1984), but it extends beyond the typical considerations of firm-specific capabilities to include capabilities that may reside also in public agencies and organizations (Fabrizio 2012; McGahan et al. 2013).

Moreover, our understanding of both public and private capabilities in PPPs incorporates an understanding that such capabilities may capture a range of organizational abilities that are related not only to the functional execution of actual partnership, but also to the governance aspects of partnership. In terms of organization-specific attributes that are associated with such PPP capability development, in this paper we specifically explore *experience-based* capabilities, associated with internal (unstructured) learning through past partnership experience, and more specific *governance-based*

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<sup>1</sup> For the sake of brevity, we hereafter refer to them as public capabilities and private capabilities, respectively.



capabilities, associated with the establishment of specialized structures that permit organizations to learn how to design partnerships to deliver desired outcomes (Argyres and Zenger 2012; Kale et al. 2002).

Our perspective thereby builds on an understanding that a public or private organization can enhance its PPP capabilities, first, on the basis of prior partnering experience and associated learning of how underlying partnerships may need to be functionally executed. Prior studies illustrate how increasing returns of specialization allow organizations to deploy specific well-defined operational abilities over time and benefit from learning advantages (Rotemberg and Saloner 1994). Second, we also recognize and identify the role of more structured organizational mechanisms specifically created to design and govern public-private collaborations. In analogy to the extensively studied private “alliance function” in the larger literature on interfirm partnering (Kale et al. 2002; Kale and Singh 2007), such structures in the public-private sphere are likewise expected to be associated with an enhanced ability of organizational actors to design valuable collaborations, monitor project execution, obtain, synthesize, and disseminate knowledge pertaining specifically to the governance of relevant interorganizational ties, thus allowing positive contracting benefits for society and all transacting parties (Mayer and Salomon 2006). Although these two sides of capabilities in public-private collaboration are related—specialized PPP structures can also accumulate experience on how to manage alliances over time—they capture distinct facets of collaboration capabilities. For instance, a domestic government may engage in a string of successive PPPs without establishing specialized structures to govern the whole process. Alternatively, it may craft these specialized structures even without a long record of alliances and still benefit from enhanced governance capabilities in PPPs. Furthermore, even though alliance functions in the context of public-private interactions do not require previous experience, these arrangements involve specialized and not easily acquired resources.<sup>2</sup> We thereby posit that both experience-based and more structured governance-based attributes of PPP capabilities on both the

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<sup>2</sup> For instance, governments creating PPP units or firms interested in investing in a particular country may draw from practices and regulations of other countries, but they may also need to adapt these features to their specific context. In other words, the very process of crafting specialized governance structures may require idiosyncratic investment by both public and private actors. We thank an anonymous referee for raising this point.

public and private actor side are able to influence private scope decisions in PPPs, not only directly but also by interacting with the institutional environment.

#### *Public Sector Capabilities in Public-Private Collaboration*

As mentioned, by public sector capabilities in PPPs we refer to the ability of public actors to craft, develop, manage, and oversee effective public-private collaborations—i.e., to organize, execute, and govern these interactions in the pursuit of public interest. The concept of public capabilities is closely related to the state capacity construct, which explores the general capacities of government organizations to effectively implement official goals and promote economic growth (Evans and Rauch 1999; Evans et al. 1985; Hanson and Sigman 2013). Yet unlike more generic features of traditional Weberian notions of bureaucracy, such as meritocratic recruitment of public officers and predictable career ladders (Weber 1968), public capabilities in PPPs pertain to the more specific set of abilities, skills, and routines of public agencies in crafting and implementing cross-sector collaboration.

As mentioned, there are several attributes under which such capabilities to manage PPPs may be accumulated and manifest on the public actor side. The strategic management literature suggests that a progressive accumulation of knowledge, know-how, and managerial skills by organizational actors (Cacciatori and Jacobides 2005; Helfat and Peteraf 2003; Teece et al. 1997), and notably learning by doing, is a leading factor in the generation and accrual of capabilities (Zollo and Winter 2002). Thus, accumulated public actor partnership experience can facilitate the modification of routines, procedures, resources, and organizational processes in the direction of the desired goals (Klein et al. 2013; Zollo and Winter 2002). In line with these arguments, we expect that past experience in public-private collaboration may serve as a crucial mechanism for accumulation of public capabilities in PPPs. Past partnership experience may be associated with an accumulated range of abilities related to partnership set-up and execution, handling relationships with partners (Argyres and Mayer 2007), and managing the entire contracting process (Brown and Potoski 2003; Ryall and Sampson 2009)—as well as interorganizational coordination (Cabral et al. 2013; Jacobides 2006).

Public capabilities are particularly critical in public-private collaboration, given that the interaction between public agents as non-market actors with profit-seeking firms may generate divergent interests in terms of contractual and governance preferences, design, implementation, and

coordination (Bonardi et al. 2006). Knowledge gathered by public authorities across several projects may contribute to counter any negative effects from such interest divergence by improved risk-sharing, optimization, and task bundling from the private actor side, as well as the use of novel financing models and operating technologies (Chung et al. 2010). As public actors accumulate experience to contract with private parties, they are likely to be able to conceive partnership needs more clearly, to promote seamless operations, and to contribute suggestions that create value for beneficiaries. In this sense, well-developed partnering capabilities on the public actor side may enhance both the likelihood of delegating public sector tasks via private sector engagements and the partnership effectiveness—similar to how superior technical or operational capabilities in firms are found to enhance outsourcing effectiveness (Mayer and Salomon 2006). Moreover, from a governance perspective, prior contracting experience of public agencies may enhance the credibility of mutual commitments and reduce the perceived level of contracting hazards for the private actor. Public actors experienced in PPPs are also more likely to build the required level of institutional support and legitimacy necessary for more extensive private sector engagement.

Crucially, we also highlight that public agencies may craft and obtain relevant governance capabilities in public-private collaboration not only from their prior, relatively unstructured partnership experience, but also from engaging in governance-related PPP (alliance) functions. Similar to alliance functions or units in private firms which have been demonstrated to enhance the effectiveness of the firm's alliance capabilities (Argyres et al. 2012; Kale et al. 2002; Kale and Singh 2007), specialized public agencies may develop capabilities in governing PPPs through dedicated centralized PPP units. In such units, capabilities in governing public-private collaboration may be facilitated by drawing on external knowledge from other countries, adoption of best practices, more stringent project finance design, and improvement in contractual monitoring and enforcement processes (Kwak et al. 2009; OECD 2010). Although experience- and governance-based capability dimensions are related, they differ in important ways. Thus, countries may benefit from their own experience without creating specialized governance mechanisms to manage PPPs. In addition, specialized governance structures can allow public actors to learn from *other* experiences: for instance, PPP units frequently play the role

of absorbing external knowledge from other institutional settings and coordinating across a range of public offices involved in governing PPPs (OECD 2010).

In contrast to firm-specific alliance units, however, PPP units stand apart, being organizationally autonomous, and play a broader (micro)institutional role, supporting and promoting the mutual commitments undertaken by diverse public and private parties. They enhance the competences of each individual public agency to craft, manage, and monitor its PPPs, ultimately augmenting its abilities to govern the contractual relations with private actors. We observe that country-level PPP expertise units or bodies increasingly appear in different institutional settings as more and more governments establish specialized offices to learn how to structure and manage public-private sector relations (OECD 2010).

Ultimately, we hypothesize that superior public capabilities in public-private collaboration will translate into an enlarged private scope in PPP projects. Public PPP capabilities are expected to improve the coordination and collaboration interface between the two types of partners, as well as reduce uncertainty hampering private investment. Although partnering capabilities are relevant in the context of collaboration in general (Gulati et al. 2005), they become particularly critical in PPPs, where one of the parties (the government) is not only an alliance partner but also commonly a regulator (Levy and Spiller 1996). Because enlarged private scope is inevitably associated with higher demands for adaptation and coordination, a public counterpart with more developed partnering capabilities is likely to stimulate more extensive private engagement than a public partner with lesser PPP capabilities. In summary:

*Hypothesis 1 (H1): The higher the public capabilities in public-private collaboration, the higher the private scope in PPPs.*

#### *Private Sector Capabilities in Public-Private Collaboration*

While prior studies in strategy have extensively highlighted the role of private-private alliance capabilities (Ariño and Reuer 2004; Kale et al. 2002; Kale and Singh 2007), scant attention has so far been given to the role of cross-sector partnering capabilities, particularly from a private actor's perspective. Similar to the effect of public sector capabilities, we expect that the higher the private capabilities in public-private collaboration, the higher the private scope in PPPs. Such an effect, we

argue, stems from the benefits of private actor-specific capability accumulation in public partnering—again, attributable to both experience accumulation in prior engagements and to specific organizational structures developed and used to govern public-private collaboration.

We posit that private actors' prior experience in contracting with public actors is likely to foster private partnership capability development and have a positive effect on the scope of firm engagement and resource commitment in subsequent PPPs. Private actors with past PPP exposure are more likely to better identify the menu of activities that contribute to value creation in existing arrangements and future business opportunities. They can also be expected to manage the resources and execute the underlying scope of tasks more effectively. Empirically, one can frequently observe that firms operating in a specific PPP-related sector may, with growing PPP deal experience, increasingly assume the role of orchestrating the underlying value or supply chain. The impact of such value chain orchestration may involve integrated service provision on the basis of accumulated value chain management capabilities (Cacciatori and Jacobides 2005; Davies 2004; Jacobides 2006; Jacobides and Winter 2005) or the design of overarching arrangements to tap into the capabilities of other external partners (Gulati et al. 2012; Schilling and Steensma 2001). In a similar vein, accumulated prior partnership experience may attenuate contractual hazards by reducing uncertainty in future transactions (Fabrizio 2012).

Yet, private capabilities in PPPs may likewise emanate from attributes that go beyond a firm's ad hoc learning on the basis of past deals and be associated with more specialized organizational structures or vehicles created to govern the PPP. For instance, besides accumulating experience in managing public-private alliances, private actors may go a step further by creating separate organizational structures to govern the activities of the public interface, potentially with a mix of public and private capital and specific rules of interaction. We argue that conceiving and managing such specialized structures is likely to increase private actors' ability to identify partnering opportunities, articulate the complementarities of public and private resources, and manage potential contracting hazards that may emerge over time, leading thereby to accumulation of superior governance-based capabilities in PPPs. As a result, we again expect that capabilities emanating from such governance structures are likely to increase the willingness of private actors to invest and increase the scope of their engagement in PPPs as a function of enhanced contractual design, enforcement, and coordination

capabilities (Argyres and Mayer 2007; Lumineau and Henderson 2012; Ryall and Sampson 2009). By contrast, should a private firm not possess the necessary capabilities to manage collaborative ties at the public interface, governments may be much less willing to engage it in successive stages of value chain activities.

To summarize, if partnering with public actors requires specific skills and knowledge that can be leveraged in similar transactional or contractual contexts, then firms that do possess superior capabilities in public-private collaboration (attributable to either more extensive experience or governance-based structures, or both) are more likely to be able to extend their scope in PPPs. By contrast, lack of experience in PPPs in a given country and limited structural attributes on how to govern joint projects with a government partner are likely to prevent firms from committing resources to wider-scope PPP projects. Ultimately, because firm contracting with public sector partners inevitably involves considerable levels of political uncertainty that cannot be fully eliminated or completely safeguarded against, there remain contractual and political hazards that are difficult for private firms to assume, especially under an increasing scope of private engagement. Improved partnering abilities (Gulati et al. 2009) can help private firms engaged in PPP arrangements to better identify and evaluate contractual hazards (Williamson 1991) and ultimately to increase their profitability while enlarging the scope on the basis of a reshaped transaction environment (Jacobides and Winter 2005). Thus, we make the following prediction:

*Hypothesis 2 (H2): The higher the private capabilities in public-private collaboration, the higher the private scope in PPPs.*

### **Quality of National Institutions and Private Scope in PPPs**

Organizational boundary and scope decisions are also likely to be strongly influenced by institutional factors. It is well established that by setting the general “rules of the game” (North 1990), institutions may attenuate market and government imperfections (Meyer 2001), shape strategic choices of economic actors, and affect organizational relationships (Lenway and Murtha 1994). Public-private interactions typically involve investments with an elevated degree of specificity that can induce higher transaction costs and increase the underlying actor dependence on well-established institutional rules and structures governing the exchange. Thus, PPPs often represent customized configurations for a particular

institutional context. In such contexts, the interactions between idiosyncratic organization features and underlying contractual and institutional hazards are likely to affect strategic choices, including private scope decisions (Meyer et al. 2009).

Strategic management scholars focusing on the impact of institutional environment on boundary decisions agree that weaker institutional safeguards can increase private actors' exposure to a broader set of contractual hazards and hamper the effectiveness of privatization, outsourcing, and other forms of hybrid arrangements (Fabrizio 2012; García-Canal and Guillén 2008; Henisz and Zelner 2005, 2006). Institutional characteristics appear to be a highly relevant factor in firm governance decisions, particularly in settings involving government actors (Hammami et al. 2006; Henisz 2006). As prior studies suggest (Moszoro and Spiller 2012; Valero 2015), one of the major factors affecting private scope decisions is the existence of government opportunism: public actors sponsoring PPPs can use (or threaten to use) their discretionary power to extract rents from private partners who have invested in project-specific assets (Spiller 2010). Governments can also allocate additional funds to well-connected private groups instead of more capable actors, thus reducing the propensity of private actors to undertake additional investments (Ahuja and Yayavaram 2011; Inoue et al. 2013). Although some firms can benefit from a deficient institutional environment at the entry time, in the long range, weaker institutional environments with higher social volatility or uncertainty may hamper the private scope by increasing the hazards of value appropriation by third parties, such as organized group lobbying for price reductions and other changes that may negatively affect private investment (Kivleniece and Quélin 2012; Moszoro and Spiller 2012).

A weak institutional framework with unstable rules of law, lack of transparency, "red tape," and corruption—which we refer to as a *low-quality institutional environment*—can exacerbate transaction costs and contracting hazards. In this case, regulatory and law enforcement agencies are not able to efficiently regulate PPP contracts, avoid holdups, and promote a stable environment in which parties can settle agreements in the face of unpredicted events (Levy and Spiller 1994; Spiller 1990). Low-quality institutions will tend to particularly damage the implementation of PPPs with a high private scope, given that an increased scope will likely require idiosyncratic investments, an increased amount of private resources, and transaction-specific learning across a broad set of activities in the value chain

(Henisz 2002). We thereby predict that public-private engagements in a low-quality institutional environment are less likely to attract and sustain a broad spectrum of private engagements, resulting in a lower private scope. And, conversely:

*Hypothesis 3 (H3): The higher the quality of national institutions, the higher the private scope in PPPs.*

### **Interactions Between Institutions and Capabilities: Effects on Private Scope**

The relationship between institutional factors and firm-level experience has been identified as critical in prior management studies (Meyer et al. 2009; Peng et al. 2009), even if the joint role of organizational capabilities and institutional-level factors is only recently being increasingly acknowledged in firm boundary literature (Argyres et al. 2012; Brahm and Tarzijan 2014; Fabrizio 2012). Institutions may stimulate (or hinder) the deployment of organizational capabilities by creating (or obstructing) new business opportunities, new practices, and experimentation in methods and processes. Contingent on the institutional environment in which PPPs take place, repeated interactions between public and private actors can contribute to mutual learning and are likely to influence future investment decisions. From the public actor side, the accumulation of capabilities in PPPs will largely depend on parameters from the institutional environment, such as the stability of the rules of the game and an efficient public bureaucracy. If, for instance, elected governments frequently change and intervene in the public bureaucracy and create excessive formal requirements to regulate private actors, then it will be difficult to deploy accumulated capabilities to more effectively design and execute public-private collaboration (Henisz and Zelner 2005). In this case, even significant public sector experience or specialized governance-based capabilities in PPP projects might not represent a key factor stimulating private actors to run broader-scope projects.

More specifically, we posit that the very existence of high-quality political and market institutions can stimulate private investments in PPPs with a broader private scope, especially in the presence of public actors with enhanced public-private collaboration abilities. The existence of a high-quality institutional setting should enable private organizations to expand their scope as a response to superior public capabilities in collaboration. Indeed, public actors with extensive cumulative partnership experience and set-up of specialized governance units (functions) may be better equipped



to identify potential areas for private investment and invite private actors to participate in more complex phases of the design and implementation of PPPs. Yet, at the same time, private actors need to be confident that their private investment will not be expropriated and that ongoing projects will not be discontinued according to discretionary changes in rules and provisions. If the institutional environment is unstable and plagued with hazards (both political and contractual), private actors may be reluctant to enhance the scope of their projects even when domestic public actors have developed broad-ranging capabilities to structure and manage PPPs. In other words, we predict that high-quality institutions can *complement* the effect of public capabilities in public-private collaboration and reinforce the propensity of private organizations to increase their scope in public-private collaborations. Thus:

*Hypothesis 4 (H4): The higher the quality of national institutions, the higher the impact of public capabilities on the private scope in PPPs.*

In the context of public-private collaboration, as argued, prior partnership experience may permit private firms to create and recombine different resources, and to develop novel capabilities that allow them to adjust their scope of engagement (Shanley and Peteraf 2004; Zollo and Winter 2002). At the same time, the hazards or possibilities posed by the institutional environment will affect the extent to which such firms are willing and able to deploy their idiosyncratic accumulated capabilities (Hoopes et al. 2003; McEvily and Zaheer 1999). As firms accumulate abilities in dealing with different government bodies throughout the world, they are more likely to avoid further commitments with countries with unstable institutions (García-Canal and Guillén 2008). Hence the nature of the institutional environment is likely to significantly condition the effect of private capabilities in PPPs on the private scope in such engagements.

More specifically, we argue that in the presence of private capabilities in public-private collaboration that are well developed—as attributable to both prior partnership experience and/or the existence of more specific PPP governance structures in the firm—an enhanced institutional setting is likely to foster broader private actor scope in PPPs. The logic behind this contingent effect lies in recognizing that private capabilities in PPPs may be most effectively deployed when firms are embedded in an enabling institutional environment, allowing the private actor to reap gains from its idiosyncratic resources and abilities. Suppose, for instance, that a private firm has developed experience

in executing and managing PPPs in a given country and sector. If weak institutions fail to protect the firm from discretionary changes in rules and increase its perceived transaction costs, firms will be reluctant to capitalize on prior experience to engage in broader-scope PPPs. In contrast, higher-quality institutions are expected to increase the willingness of private actors to use their cumulative knowledge to broaden the scope of collaborative ties with governments.

Even more so, we posit that the ability of firms to deploy any specific and superior governance-based capabilities in PPPs is likewise contingent upon the characteristics of the institutional environment. This is due to the nature of public-private engagements: in the public-private collaboration (as opposed to purely private alliances), the existence of governance-based capabilities on the private side may not fully compensate for deficient institutions, as no superior private governance capabilities may override public actors' capacity to rewrite local rules and provisions (Spiller 2010). Past research has shown that firms may not benefit from recurring alliances with public and political actors if the local institutional environment is highly volatile (along these lines, see Siegel (2007) and Dorobantu et al. (2017)). In addition, as argued by Garcia-Canal and Guillen (2008), firms are likely, over time, to develop an aversion toward governments that discretionarily change local rules. In this sense, even if private actors develop specific governance capabilities on how to deal with public partners, the deployment of these capabilities in terms of broader business scope will be contingent on the quality of the local institutional environment.

Based on the above reasoning, we argue for a *complementary* effect between private capabilities in PPPs and the quality of institutional environment in determining the private scope in public-private collaboration. Specifically, we expect that superior private capabilities in PPP are more likely to result in enlarged private scope when the quality of national institutions is high. By contrast, in order to avoid future expropriation and other adverse changes due to a hazardous political environment (which firms may be unable to mitigate regardless of how capable they might be), private actors are likely to decrease their scope in PPPs when they have scant private capabilities and even more so when domestic institutions are weak. Even when firms have accumulated experience on how to deal with the specificities of PPP projects, a more hostile institutional setting is likely to increase the perceived transaction costs and hazards associated with broader-scope private activities (Williamson 1999). By

contrast, a high-quality institutional environment will prompt firms to leverage their established range of partnering capabilities and increase the extent of their private engagement. In sum:

*Hypothesis 5 (H5): The higher the quality of national institutions, the higher the impact of private capabilities on private scope in PPPs.*

## **DATA AND METHODS**

### **Data Sources and Sample**

We use several data sources to test our hypotheses. As the primary and main data source, we use the Project Finance International (PFI) and Securities Data Company (SDC) Platinum Global Public Finance databases from Thomson Reuters. We pool observations from these two databases and obtain a novel, consolidated dataset on PPP engagements completed across the world over two recent decades (1992–2012), covering both developed and emerging countries. This original recompiled database also offers us a chance to cover a comprehensive range of industries, including infrastructure and services, and different types of PPPs, with detailed information on their scope and the nature of their engagement (year, size, contract type, value, duration, partners, advisors, and financial sources). In addition, for the purposes of this study, we draw complementary data on country- and sector-level characteristics from the World Bank Development Indicators (WBDI) database and the IMD World Competitiveness Yearbook (WCY). The latter in particular is a recognized reference data source in assessing the competitiveness and institutional environment of nations, and has been used in various prior studies (Chacar et al. 2010; Hermelo and Vassolo 2010).

Our initial sample covered 1,831 PPP arrangements recorded and obtained from the PFI and SDC Platinum databases. In our final sample selection, we focused on finalized deals to avoid biasing it with announcements that were not carried through. We further narrowed our sample by excluding PPPs with missing or uncompleted information on the main contractor, the name of the project, or the date of the announcement of the agreement. We also dropped cases that did not clearly identify the private operator, those without any further identification of the type of private scope, and those without information from the WBDI and/or the IMD WYC. Our regressions further resulted in fewer effective cases due to several added controls (missing for some firms and countries). We then arrived at a final sample of 1,003 PPPs from seven regions, 96 countries and 9 sectors from 1992 to 2012 (Appendix 1).

## **Dependent Variable**

Our unit of analysis is the PPP contract between a main private contractor (and service provider) and a public organization. Our dependent variable measures the degree of *private scope* in terms of the breadth of contractual tasks the private actor undertakes. A higher private scope has also been referred to as “bundling” in prior studies (Hart 2003; Iossa and Martimort 2012), and this corresponds to a combination of various value chain activities run by the private partner in sequential phases. These activities typically include designing the facility or asset, building it, managing asset ownership, financing the project, executing the operations after the facility is completed (with or without potential transfer of infrastructure to the public sector after the expiry of the contract). Practitioners and policy makers distinguish between several types of PPPs based on the extent of private involvement (i.e., scope) in those activities (see, e.g., the World Bank Institute/PPIAF Public-Private Partnership Reference Guide (2012)). For instance, Build-Lease-Transfer (BLT) PPPs are those with a relatively low scope of private involvement: the private agent builds and operates a facility without designing it or retaining the formal ownership rights to it. In contrast, a Design-Build-Finance-Operate (DBFO) PPP represents an arrangement with a very high level of private scope. In this type of PPP, private actors are responsible for the design, building, financing, and operating of a facility that they also temporarily own.

Building on the PPP contractual categories reported in the PFI database, we created a measure of private scope based on the extent of private involvement in the project as an ordered categorical variable, ranked from lowest (0) to highest (3). Such a ranking corresponds to the level of private actor engagement in the set of activities to deliver the final asset and underlying services (see Appendix 2). Cases coded as 0 include PPPs in which the private operator’s primary task is to build the asset (which it then leases back from the public actor); as opposed to the other types, cases coded as 0 never involve ownership, even temporarily. Cases coded as 1 are those in which the private actor builds and operates the facility but does not design it nor typically own it (or owns it only temporarily). Cases coded as 2 are those in which the private operator is responsible for most of the activities of the project (including financing and ownership), but not the design phase. Cases coded as 3 (maximum involvement) are those in which the private operator designs, builds, operates, and provides capital to invest in the facility, as

well as assumes full ownership rights for an extended period of time. Our coding thus reflects a spectrum with an increasing private organizational scope, moving up from a simple concession or leasing (0) to the almost complete coverage of design, building, financing, and execution of the project by the private partner (3). The coding captures a progressive increase in the well-established set of functions in PPP contracts for which a private party may be responsible: designing, building (or refurbishing), financing, maintaining, and operating (PPIAF/World Bank Institute 2012).

To further validate our coding scheme, we proceeded in three ways. First, we ran robustness checks with alternative coding schemes and found similar results in our regressions (explained in more detail in the Results section below). Second, we tested and verified our coding scheme with 37 independent academic and professional experts in PPPs from 11 different countries (such as France, Chile, Brazil, Portugal, and Italy). The experts were asked to evaluate the extent to which they agreed with our operationalization of private scope. We provided them with our proposed coding (as shown in Appendix 2) and then asked them to indicate on a 1–5 Likert scale (a) whether they agreed with our coding of private scope, and (b) whether they expected that moving from category 0 to 3 would increase the number of functions/tasks performed by the private actor in a given PPP. Responses to the two questions were, on average, 4.05 and 4.22, respectively. To check respondents' agreement on the two questions, we used McNemar's test (Agresti 1996). We built a scale to assess the degree of agreement among the experts on our questions, coding 1 for Likert grades equal or superior to 4, and 0 otherwise. The test does not reject the null hypothesis of agreement among the experts, thus indicating that specialists similarly and positively assessed the appropriateness of our coding.

Third, although our original database does not provide comprehensive information on the extent of private equity investment in each project, we were able to gather data on 51 observations indicating the percentage of equity of the PPP directly held by the private operator. We found that this percentage monotonically increased with our measure of private scope: 12.9%, 19.6%, 54.1%, and 77.2% for cases coded 0, 1, 2, and 3, respectively (also found to be statistically significant according to a Kruskal-Wallis rank test). Considering these complementary validation results, we are thus confident that our proposed coding system satisfactorily measures the extent of private involvement (i.e., scope) in PPP projects.

## **Independent Variables**

### *Public Capabilities in Public-Private Collaboration*

In line with our theory discussion, we gauged public capabilities in PPPs in two complementary ways. First, considering that cumulative experience in PPPs increases public actors' ability to craft and execute these types of collaboration, we measured the cumulative partnering experience of the public actors by the directly observed, recorded number of past PPPs in a given sector and country. Thus, in a given year in which the PPP was signed, and based on the list of PPPs in our database, we created the variable *Past PPPs executed in the country* as the count of cumulative public-private collaborations in the particular country and sector of the PPP. For instance, if the PPP was in water and sewerage, we counted the number of past PPPs in water and sewerage executed in the country in previous years (with 1992 as the first observation year). Our sector-specific focus uses the rationale that partnering capabilities are likely to vary across sectors, given that each sector has distinct types of investment, knowledge, and contractual provision needs. Second, to more directly gauge the capacity of public authorities to govern PPPs, we researched and recorded for each country in the dataset the existence of a government unit (or public agency) specialized in the design, implementation, and/or monitoring of PPPs, and the year when this unit was created. Considering that older units likely have more developed and enhanced routines and governance processes, we then created the variable *Specialized PPP unit* as the number of years since the establishment of a country-level unit with formal responsibility to deal with PPPs. To obtain the data for this variable, we conducted an extensive search of websites and numerous archival sources (such as legal consultancy reports, OECD/World Bank reports, and others) to find information on the creation of specialized PPP units in each specific country. Our search identified PPP units in developing and emerging countries alike. The supportive role provided by PPP units appears particularly pertinent to attenuate the perceived level of contractual hazards and project risks for private actors (European Investment Bank 2011). For instance, in British Columbia, a PPP unit arranged to set up processes to assist in managing risks for the Canadian infrastructure development through PPPs, while in Brazil, the local PPP unit crafted important guarantees for the Arena Fonte Nova

football stadium on actions that might affect the expected returns on investments (Cabral and Silva 2013, European Investment Bank 2011, Xenidis 2013).<sup>3</sup>

***Private capabilities in public-private collaboration.*** We also measured private capabilities in two complementary ways. As in the case of public capabilities, we created an experience-based measure, *Past PPPs executed by the firm*, as the cumulative number of past PPPs engaged in by the private actor in a given sector and country. As in the case of our public experience measure, we consider that experience depends on the intersection of country- and sector-specific conditions affecting the ability of private actors to learn about the specific activity of the PPP as well as the specific institutional attributes of the country. In addition, we sought possibilities to assess more specifically the private actor's governance-based capacity to partner with governments by investigating and coding the presence (or not) of a special purpose vehicle (SPV) crafted to manage the PPP. More specifically, we observed whether the SPV was partially funded by a government actor (at the national, state, or local level). In our interpretation, the presence of state capital is not only a signal of the private partner's extent of connection with the domestic government but also an indicator of its ability to co-manage specialized public-private organizational units with relevant state actors (Musacchio and Lazzarini 2014). Our measure, *Ability to partner with governments*, codes the percentage of past PPPs executed by the private actor in the same country that had the presence of state capital through equity-based arrangements and/or public subsidies.<sup>4</sup>

***Quality of national institutions.*** To measure the quality of national institutions, we examined and performed a factor analysis based on variables reported in the WCY, which has been used in previous research to measure institutional development (Chacar et al. 2010; Hermelo and Vassolo 2010; Inoue et al. 2013). We built on three institutional features that are not only expected to affect the

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<sup>3</sup> As empirical evidence shows, countries worldwide create specialized PPP bodies to pursue a number of objectives, such as to cope adequately with the risks associated with an increased number of PPPs, to augment the confidence of private partners interested in investing in PPPs at both the country and local level, to identify the most relevant PPP projects, to provide policy guidance and the dissemination of best practices, and to build a central repository of specialized knowledge on financial, economic, and legal aspects of PPPs (see OECD 2010; European Investment Bank 2011). Such PPP units also tend to adapt to the specific context of PPPs and adopt practices that best serve the purpose of governing collaborative ties with the private sector.

<sup>4</sup> To compute this ratio, we considered at least three instances of past PPPs in the country executed by the private actor.

perceived quality of the local environment for PPPs, but also appear to be highly related: quality of the bureaucracy, absence of bribery or corruption, and perceived transparency. We then computed an index of institutional quality by using the average of those measures (Cronbach's alpha = 0.808). We also performed a robustness check using an alternative measure of institutional development derived from the World Bank's Worldwide Governance Indicators database (Kaufmann et al. 2009), described in our Results section.

### **Control Variables**

In the estimation models, we included a range of control variables that are expected to affect the private scope in PPPs. Variable *Contract value* measures the size of the PPP contract (logarithm value, in millions US\$), and was introduced to control for differences in size and scale that may influence the level and economic returns of private investment. We also used a dummy variable, *Government partner*, to measure the presence of state funding in the SPV of the observed PPP (recall that our previously discussed variable *Ability to partner with governments* measures the extent to which the private actor was involved in *past* PPPs with the government as a funding partner). Given our emphasis on local and institutional factors, it was crucial to add a range of country-level controls. We added *Population* (the logarithmic value of the national population) and *GDP per capita* (in thousands US\$ at purchasing power parity, in logarithmic form) to account for differences in the size and income of the local market. In order to control for other institutional factors unrelated to our key quality construct, we added supplementary measures from the WCY: *Competition legislation* (whether the country facilitates firm entry and competition, which should affect private scope decisions); *Financial development* (access to local capital markets); and *Availability of skilled labor* (which should also affect the firm's ability and cost to execute local PPP-related activities). We also controlled for the *Credit availability* in the country using a measure of credit to the private sector as a percentage of GDP (collected from the WBDI). Another important factor that can influence the propensity of the country to sponsor PPP-related activities is the overall availability of public capital and the extent of public spending that can be allocated to PPPs. We thus added a variable called *Government expenditures*; using data from the WBDI, we coded the ratio of government spending to GDP. Finally, to control for any temporal effects



and other unobservable sector-level factors, we added a set of year and sector dummies. Tables 1 and 2 summarize our variables and their descriptive statistics.

< Tables 1 and 2 about here >

## **Method**

Given the nature of our dependent variable—gauging private scope in a categorical, ascending order—we adopted the ordered probit model (see, e.g., Greene 2000) to test our hypotheses. This model is useful in a context like ours where there is an increasing variation in the degree of private scope, given the diverse categories of PPP arrangements that governments and private firms can employ. Estimated through maximum likelihood, the ordered probit model indicates how a change in a certain independent variable affects the likelihood of observing ordinal outcomes. We also used robust (Huber-White) estimators of standard errors and clustered them at the country level to accommodate potential correlations between observations from the same country.

Although our last two hypotheses predict interaction effects between capability- and institution-based factors, the appropriate test of those effects is not straightforward in probit and logit models (Hoetker 2007; Zelner 2009). Given the nonlinear specification of those models, simply adding interaction terms can lead to erroneous inference. We thus proceeded in two ways. First, we present the results of split-sample regressions involving PPPs executed in countries with lower-quality institutions and countries with higher-quality institutions. To define these subsamples, we created a dummy variable coded 1 in the case of countries above the median of our variable *Quality of institutions* (described above), and 0 otherwise. Second, we also compute the marginal effects of our hypothesized variables according to the level of institutional quality, keeping the other variables constant at their means.

## **RESULTS**

### **Main Results**

Table 3 presents our regression results. Models 1–4 progressively add our hypothesized variables to test their proposed effects. Models 5a and 5b, in turn, show the results of split-sample regressions to examine how our estimated coefficients vary according to the quality of national institutions.

<Table 3 around here >

Broadly taken, our results illustrate the importance of considering jointly the effect of the quality of national institutions and capability-based determinants on private scope in public-private collaboration. We find that the role of public and private capabilities is highly contingent upon the quality of national institutions, even though the latter also has a very consistent direct effect on private scope. Thus, across all our models, we find that *Quality of institutions* is highly significant ( $p < 0.01$  in all models except 5a, in which  $p < 0.05$ ) and carries a positive effect on the private scope. This result lends strong support to our hypothesis on the effect of the institutional environment (H3): the quality of national institutions is a relevant and strong determinant of private scope. The improved quality of national institutions is likely to reduce perceived risks of adverse contract renegotiation, unfavourable legislation, and expropriation, thereby augmenting the willingness of private actors to increase the scope of their engagement in the project. This result also emphasizes the underlying diversity and importance of examining PPPs across a broader range of countries with varying institutional traits. Because developing and emerging countries typically exhibit voids in terms of poor infrastructure and public services, there is a potential opportunity for private actors to step in and develop value-creating projects with greater private investment. Yet, our results show that the very nature of local institutions, crucially, may inhibit extensive private participation. In other words, increased private scope seems to be generally (and perhaps primarily) constrained by the domestic institutional environment that private actors face.

Models 1–4, with the complete sample, allow us to assess our hypothesized effects of private and public capabilities in PPPs. A progressive introduction of explanatory variables allows us to examine the relative contribution of each hypothesized determinant of scope. Table 3 thus reports the incremental (pseudo)  $R^2$  of each regression as well as tests of the joint significance of variables added beyond the model without the hypothesized variables (i.e., with control variables only). We first find that our variables measuring public capabilities in PPPs are not significant at conventional levels, either when added alone (model 2) or jointly with the measures of private capabilities (model 4). Thus, H1 (on the general effect of public capabilities in PPPs) is rejected. Yet, we do find, and discuss below, the effect of public capabilities as likely to be highly contingent on the quality of national institutions. Moreover, we do find support for H2: although the experience-based measure of past PPPs executed by

the private actor is not significant, we find that the ability of the firm to partner with governments, established on the basis of prior structured joint capital engagements, positively and significantly explains private scope ( $p < 0.05$ ). We deem this result as suggesting that experience may not necessarily increase private actors' willingness to engage in higher-scope projects if they lack more specialized capabilities to cooperate and deal with governments. Our variable coding past instances of joint state capital engagement in an SPV seems to be a more refined indicator of the capacity of a private actor to govern public-private collaborative forms, and our findings demonstrate that it carries a significant effect on private scope of engagement.

Split-sample regressions 5a and 5b allow us to test our predictions on contingent effects. Crucially, when differentiating between high-quality and low-quality institutional environments, we find significant effects involving our measures of public capabilities in PPPs. Thus, in support of H4, we find that the effect of past PPPs executed in the country is positively affected by the quality of institutions. Yet, past public experience in PPPs only appears to encourage broader private scope when domestic institutions have high quality ( $p < 0.05$ ) and is negatively associated with private scope when institutions are less developed ( $p < 0.01$ ). Regression coefficients across the subsamples are also significantly different from each other according to a chi-squared test of coefficient comparison ( $p < 0.01$ ).

The above result, we argue, illustrates the contingent nature of public sector capabilities in public-private collaboration, the effect of public capabilities being highly dependent on the characteristics of the underlying institutional environment. Thus, in highly developed settings, accumulation of relevant public sector experience in PPPs enhances the credibility and legitimacy of public sector commitments, permits public agents to draw on organizational capabilities gained in prior dealings with private actors, and as a result, facilitates larger-scope engagements on the private side. By contrast, our results suggest that low-quality institutional environments may not deter PPPs altogether, but effectively permit them only by reducing the private actor scope. Public actor prior experience in PPPs, in such settings, is likely to enable public decision makers to progressively develop an approach of reducing the scope of private actor engagement to a sufficiently narrow level that will still entice and guarantee private actor collaboration despite the limitations in the strength of the

institutional environment. Thus, at least for our experience-based capability measure, the complementary relationship between institutions and public capabilities holds and is supported by our results.

Interestingly, and somewhat counterintuitively, we also find that the effect of our more specific, PPP unit measure of public capability goes in the opposite direction to what was predicted (H4). We find that the presence of specialized PPP units, on the public actor side, has a significant effect and prompts higher private scope in PPPs only when the quality of institutions is low ( $p < 0.01$ ), suggesting a compensatory, substitutive effect in the presence of insufficient institutional development. Overall, this unexpected result suggests a more nuanced contingent effect of institutions on public capabilities. As predicted, public experience leads to superior private engagement under higher-quality domestic institutions; however, the positive effect of governance capabilities developed through specialized PPP units is more pronounced when the local institutional environment is less rather than more developed. Our interpretation of this novel and contingent result is that institutions interact differently with the distinct attributes of organizational capabilities. The effect of experience-based attributes of public capabilities in PPPs depends on the presence of high-quality domestic institutions, because without such a safeguarding environment, private actors will not feel confident that public actors will use their local accumulated experience to encourage and protect private investment. Accumulated experience in a weak environment may even backfire, by exposing regulatory and contractual voids detrimental to the attraction of private actors. Centralized country-level PPP units, in contrast, may create an improved, insulated partnering milieu with the required organizational abilities and specialized personnel with the capacity to understand the perceived risks of private actors and take actions to mitigate these risks. Acting as “pockets of efficiency” within the public bureaucracy (Evans 1989; Geddes 1986), these units are thus expected to be more conducive to superior private scope specifically when the domestic institutional environment is weak. The presence of specialized PPP units therefore acts as a safeguard and external guarantee to private actors, alleviating some of the institutional and contractual hazards in

underdeveloped environments. In sum, the “micro” institutional environment of PPP units may help to supplant an environment with poor “macro” institutions.<sup>5</sup>

Regarding the contingent effect of private capabilities in public-private collaboration on private scope (H5), we find that our previously detected positive effect of the structural ability to partner with governments is significant in the subsample with high quality of domestic institutions ( $p < 0.01$ ); and that the coefficient of this variable is positive and significantly higher in this subsample than in the subsample with lower institutional development, according to a chi-squared test of coefficient comparison ( $p < 0.01$ ). We do not find any significant result involving the experience-based variable coding the past PPPs executed by the firm in the same country and sector. Thus, with respect to our second measure of private capabilities in PPPs, our results lend partial support for H5: the effect of private capabilities is significant and stronger when institutions are more developed, suggesting a complementary effect. In other words, in higher-quality institutional environments, private capabilities accumulated via prior government partner joint capital-based relations may permit private actors to increase private scope, most likely—we argue—by reducing the uncertainty and hazards of the collaboration via development and deployment of specific organizational capabilities in dealing with selected public sector actors. In low-quality institutional environments, by contrast, we find no compensatory effect, due, we deem, to persistence of fundamental underlying institutional hazards that no private capabilities can fully mitigate.

### **Analysis of Marginal Effects**

We computed the marginal effects of the variables found to be significant in Table 3. Because we are mostly interested in the moderating effect of institutional quality, we compute the marginal effects of our hypothesized variables at representative values of each variable, as suggested by Williams (2012).

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<sup>5</sup> We also experimented with changing the specification of our PPP unit variable by computing the cumulative number of PPPs that had occurred in the country since the creation of the PPP unit. As expected, this new variable is highly correlated with our measure of past PPPs executed in the country (the correlation coefficient is 0.823). Ignoring this high correlation, we ran an additional regression introducing both measures coding PPP unit experience. However, only our previous measure coding the number of years since the establishment of the PPP unit remained significant; the alternative measure coding the number of cumulative PPPs since the creation of the PPP unit was not significant. A possible explanation is that, as discussed before, PPP units may draw not only from their own experience in managing PPPs, but also from the absorption of external knowledge and practices from other contexts.

Namely, we assess how the probable increase or decrease of private scope responds to an increase in each hypothesized variable, according to distinct levels of institutional quality and holding all other variables constant at their means. Given the nature of the ordered probit model, we focused on the effect of variables on the highest possible scope (i.e., cases involving design beyond ownership, 3 in our coding scheme). Figure 2 graphically depicts our estimated marginal effects at representative values of institutional quality.<sup>6</sup>

*<Figure 2 around here>*

The first graph in Figure 2 shows the marginal effect of public capabilities as measured in terms of past experience with PPPs. In line with our previous results and H4, increased public experience enhances private scope when domestic institutions are relatively more developed. Under higher-quality institutions, the confidence interval of the estimate is above zero, indicating a positive effect, while the reverse is true under lower-quality institutions. For instance, in countries with a governance index superior to 7 (in our database, Finland or Singapore), the probability of high private scope increases by 12.7 percentage points when the number of past PPPs in the same country and sector increases by one standard deviation (equivalent to 30.4 additional PPPs). However, contrary to H4 but in line with our split-sample results reported in Table 3, the second graph in Figure 2 shows that specialized PPP units have only a positive marginal effect on the probability of high scope when the quality of domestic institutions is low. Thus, in countries with a governance index of around 3 (such as Turkey or Argentina), the probability of high scope increases by 2.5 percentage points when the number of cumulative years after the establishment of a PPP unit increases by one standard deviation (equivalent to around 6 additional years). Finally, the third graph shows that the ability of private actors to partner with governments (via joint capital-based engagements) only influences higher private scope under more-developed institutional settings; confidence intervals are above zero and the marginal effect of the variable begins to increase when our index of institutional quality becomes higher. For instance, in countries starting with a governance index around 5 (such as Chile or Ireland), the probability of high

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<sup>6</sup> We use the commands “margins” and “marginsplot” in Stata, adding the “dydx” option to compute marginal effects and the “at(.)” option to assess changes at representative values (see, e.g., Williams, 2012, p. 327).

scope increases by 2.9 percentage points when the percentage of past PPPs with SPVs in association with a government partner increases by one standard deviation (equivalent to 9.5 percent).

The depicted effects therefore confirm our findings in the split-sample regressions. Namely, we find that institutional development augments the effect of public actor experience, as predicted in our H4; yet, interestingly, we also find that the scope-enhancing effect of specialized public PPP units is higher under lower- rather than higher-quality institutions. Also, at least with respect to our measure of private actors' ability to partner with governments, we find that the effect of private capabilities in PPPs is positively influenced by an increase in the quality of the local institutional environment, thus lending support for H5.

As an additional check, we followed Pinzon's (2016)<sup>7</sup> suggestion to assess average marginal effects by computing the derivative of the coefficient of each observed variable with respect to our moderating variable, institutional quality (e.g., we first computed the derivative of the probability of higher scope with respect to a hypothesized variable, and then the derivative of this expression with respect to institutional quality). Because the proposed procedure uses a regular probit specification, we adopted a dichotomous version of our dependent variable by considering that higher scope occurs when the scope variable is either 2 or 3. As expected, the computed marginal effect is positive for the number of past PPPs in the country (.001,  $p = 0.017$ ), indicating that an increase in institutional quality enhances the effect of public experience on private scope. Likewise, the computed marginal effect involving the PPP unit variable is negative (-.007,  $p < .001$ ), confirming that improved institutional quality reduces the effect of PPP units on scope. Finally, and also as expected, institutional quality increases the effect of higher ability to partner with governments (.139,  $p = 0.095$ ).

### **Robustness Checks**

We used a number of empirical checks to verify the robustness of our results. We replicate our split-sample regressions 5a and 5b (Table 3) using a host of new specifications, whose results are presented in Table 4. Using additional information from the Thomson Reuters databases, models 6a and 6b add a

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<sup>7</sup> See Pinzon, E. Effects of nonlinear models with interactions of discrete and continuous variables: Estimating, graphing, and interpreting. The Stata Blog, 2016. Available at <https://blog.stata.com/2016/07/12/effects-for-nonlinear-models-with-interactions-of-discrete-and-continuous-variables-estimating-graphing-and-interpreting/> (accessed on March 2, 2018).

variable coding the cumulative number of projects in the same set of sectors that were *not* structured as PPPs. For instance, private firms can raise capital and fund privately owned energy facilities. We added this variable to capture the general trend in private engagement, thus partially capturing remaining unobserved factors such as the propensity of a country to improve the local environment for private investing. Models 7a and 7b, in turn, use an alternative institutional measure based on the World Bank's World Governance Indicators database (Kaufmann et al. 2009). In line with our main measure, we create a composite variable including four items of the database related to corruption, rule of law, regulation, and quality of the government (Cronbach's alpha = 0.969). This new variable is found to be highly correlated with our previous measure of *Quality* (correlation coefficient = 0.803,  $p < 0.01$ ). Furthermore, models 8a, 8b, 9a, and 9b check the robustness of our dependent variable results based on changes in the way distinct PPP types are coded. For instance, one might argue that the Lease-Renovate-Operate-Transfer (LROT) and Build-Operate-Transfer (BOT) types may not necessarily differ substantially from the more straightforward BLT type if firms do not own or renovate required infrastructure (see Appendix 2). Thus, Models 8a and 8b (re)classify LROT as 0 together with BLT, while Models 9a and 9b (re)classify BLT, BOT, and LROT as 0; Build-Operate-Own (BOO) and Build-Operate-Own-Transfer (BOOT) types as 1; and Design-Build-Operate-Transfer (DBOT) and Design-Build-Operate-Finance (DBFO) types as 2.

From our extensive robustness tests, we find that our previous results remain generally strong, with similar conclusions in terms of the contingent effects of public and private capabilities depending on the quality of domestic institutions. Our results hold when we adopt alternative measures of quality, change the categorization of our dependent variable, or adopt an additional country-level control capturing general trends associated with the attraction of private capital. In other words, we can confidently say that improvements in institutional quality promote superior private scope, even though domestic institutional conditions do not act in isolation and interact with public and private capabilities in complex ways. Thus, in countries with more developed institutions, projects with broader scope will generally emerge, but their incidence will increase when public actors have experience in sector-level PPPs and private actors have a distinct ability to attract governments as partners (as evidenced by the presence of state capital in the SPV of the PPP). In countries with less developed institutions, in contrast,



PPPs will tend to have a narrower private scope, but local governments can encourage private involvement by creating specialized units capable of dealing with PPPs.

<Table 4 around here>

## **DISCUSSION AND CONCLUSION**

Although academics and practitioners have debated the merits of public-private collaboration as a novel hybrid organizational form bringing together governmental and private resources for public interest (Henisz 2006; Kivleniece and Quélin 2012; Mahoney et al. 2009; McGahan et al. 2013), these partnerships are far from a uniform phenomenon. Not only do PPPs differ across the various institutional and industrial contexts where they can be found, they also vary depending on whether private firms are more or less willing to undertake a full spectrum of responsibilities and deploy required resources in the architecture and operation of these partnerships. This paper sheds light on the determinants of private scope in public-private arrangements, defined as the extent to which private actors invest and participate in multiple interrelated activities along the value chain of public-private projects. Using a unique database of two decades of PPPs completed worldwide, we reveal an interesting interplay between the effects of public and private capabilities in public-private collaboration, found to be contingent upon a key country-level factor: the quality of national institutions.

Our results demonstrate that institutional environment, jointly with public and private capabilities in PPPs, is an important determinant of private scope in such collaborative arrangements. More specifically, our results suggest that institutional environment affects the private scope directly and positively by modifying the perceived level of political or contractual hazards and hence altering the likely extent of private actor engagement in public sector activities. In this respect, our work reinforces the insights from prior literature that highlight the role of a stable political environment and institutional safeguards as primordial in facilitating private, multinational investment by mitigating the risks of opportunistic expropriation by governments (García-Canal and Guillén 2008; Henisz 2000a; Henisz and Zelner 2001; Williamson 1996). But while prior research has focused on the determinants of a private actor's unilateral investment in a host country, our study is among the first to examine and emphasize the role of institutional environment in enabling (or restricting) *the extent of direct public-private sector collaboration*. The extent to which private actors are willing to engage in a broader set

of value-creating activities in a PPP is shown to be directly and positively related to the presence of institutions that guarantee the rule of law, transparency, and overall effectiveness of public bureaucracy.

Furthermore, and crucially, building upon previous works (Fabrizio 2012; García-Canal and Guillén 2008; Holburn and Zelner 2010), we also demonstrate that institutional environment *conditions* the effect of public and private capabilities on the private scope in PPPs. While our measures of public capabilities in PPPs do not appear to provide a direct effect on private scope, our results demonstrate that their effect interacts with and is contingent on the nature of the institutional environment underlying a given PPP. In settings with high-quality institutions, prior public experience in PPPs enhances private scope, due, we argue, to the accumulation of an underlying range of public capabilities in dealing with private actors and the positive effect of an institutional environment that enhances the credibility of mutual engagement and public sector contractual commitments. By contrast, in low-quality institutional environments, public-private collaboration still takes place, but private actor scope of engagement is negatively affected by cumulative public experience. Such an effect, we posit, may stem from the fact that low-quality institutional environments present higher contracting hazards and lack the required safeguards to permit private actors to enlarge their scope of engagement. In such conditions, past public experience may expose the weakness of the local environment and demonstrate successive instances of poor execution or regulation.

Interestingly, we find a different effect of public (governance) capabilities when assessing the capability attributes associated with specialized PPP units. Capabilities accumulated via dedicated PPP units appear to have a substitute effect in low-quality institutional environments, allowing private actors to enhance the private scope in such settings. Such an effect, we argue, stems from the very nature of PPP units: in many settings, they play the role of a specialized and independent institutional defence mechanism mediating the relationship between private and public actors. Effectively, PPP units become safeguard institutions of their own, thus mitigating underlying hazards from the private actor's perspective. Prior research has established that even in environments with low or intermediate institutional development, "pockets of efficiency" may be created that increase the effectiveness of the functioning of public bureaucracies (Evans 1989; Geddes 1986). We argue that in contexts where low institutional development would inhibit extensive private actor engagements with the public sector, PPP

units enhance public actor's governance capability, specifically, and potentially offset the shortcomings or absence of well-functioning institutions, thereby enabling higher private sector engagement. Among a number of tasks, PPP units may foster a more favourable micro-environment for collaboration by helping to address voids in the legal and regulatory framework (e.g. by providing more specific project level guarantees to private investors), by developing more financially robust templates for collaboration projects, by improving and sharing contractual monitoring tools, and by enhancing the credibility of mutual commitments beyond the individual private partner level through a range of formal and informal roles (Kwak et al. 2009).

As expected, we also find an effect of private capabilities on enhancing the private scope in public sector collaboration. More specifically, we find that prior partnering ties with the government partner, via jointly funded PPP arrangements, enhances the extent of private scope in PPPs. Moreover, the higher the quality of institutional environment, the higher the effect of private capabilities accumulated via prior government partner relations—thus suggesting a complementary effect. In low-quality institutional environments, by contrast, we find that private capabilities have no compensatory effect. This is due, we argue, to the nature of contracting with public actors. Because of the superior, asymmetric power of public actors (who can offset or change existing rules), private actors are usually unable to reduce the fundamental governance hazards present in contracting in low-quality institutional environments, even in the presence of superior private capabilities in public-private collaboration.

Our work also sheds a more nuanced light on prior studies that have generally argued that prior private actor experience may act as a substitute to safeguards in the institutional environment (Fabrizio 2012). While prior firm contracting experience or political capabilities (Holburn and Zelner 2010) may indeed reduce the transaction costs associated with governance arrangements in more institutionally uncertain or hazardous environments, our study demonstrates that a broader spectrum of private capability deployment in public areas of interest, through increased scope of private activities, requires and is facilitated by the presence of a more developed institutional environment.

### **Implications for Theory**

Scholars have pointed out that PPPs—and more generally, private sector engagements in the spheres of public interest via novel hybrid organizational forms—remain under-studied in the management and

organization literature (Kivleniece and Quélin 2012; Mahoney et al. 2009). Furthermore, we lack a comprehensive understanding of the conditions under which, within the context of public-private collaborations, private actors are likely to undertake a broader (or narrower) spectrum of value-creating activities and deploy more (or less) substantial resources to carry out operations at the public-private interface. The degree of private involvement is a key element in the design and execution of PPPs because governments frequently rely on unique idiosyncratic private capabilities to manage the value chain of multiple partnership activities and deliver value within the partnership context. Thus, our emphasis on private scope adds a novel dimension to understanding the heterogeneity in public-private organizational forms, and allows for a more nuanced view of the public-private collaboration phenomenon and variations in its governance spectrum. By examining how and under which conditions private actors become progressively involved with a broader set of activities at the public interface, we provide additional theoretical underpinning to the strategic analysis of interdependencies between public and private interests (Mahoney et al. 2009).

We also expand the literature on public governance and public-private contracts by moving beyond the usual focus on contractual provisions and incentives (Bennett and Iossa 2006; Chong et al. 2015; Hart et al. 1997). In particular, we explore sources of firm- and country-level heterogeneity that have received increased attention in strategic management literature yet have only recently been applied to a public organization context—namely, capability-related (Cabral et al. 2013; Klein et al. 2013) and institution-based factors (Khanna and Palepu 2000; Peng et al. 2009). Our notions of public and private partnership capabilities attempt to capture distinct PPP capability attributes, based on prior actor experience and more structured, governance-specific elements whereby public and private actors set up and run specific partnership units (similar to alliance functions) to craft, execute, and manage PPPs. Crucially, the core attributes of public and private capabilities that we study do not appear to act in isolation but interact with the institutional environment in which the PPP is located. Our results also show that the contingent effect of institutions on private scope is complex and nuanced. While the deployment of public and private capabilities, and their effect on private scope, seem to be positively affected by the presence of high-quality institutions, the development of specialized capabilities in PPPs—embedded in specialized PPP units—seems to substitute for the absence of a more developed

institutional environment. This finding suggests that the effect of capabilities is highly dependent on the nature of the institutional environment and the underlying attributes and nature of capabilities themselves. As such, we believe this insight opens the possibility of new avenues of research to scrutinize how distinct public and private capabilities affect private scope and other relevant outcomes of PPPs.

Overall, we offer a more refined, contingent view of how experience- and specific governance-based capabilities interact with the institutional environment to create a local setting that is more conducive to broader private actor involvement in PPPs. By highlighting critical contingency effects between institutions and capabilities, our study suggests that in scholarly literature much more attention should be paid to interaction effects instead of seeing these factors as independent determinants of the extent of the private scope (or other attributes of hybrid forms).

### **Managerial and Public Policy Implications**

Our study also carries important implications for practice. Many governments find private investment and resources in PPPs appealing as a way to circumvent budgetary constraints and engage idiosyncratic private capabilities in projects for the public interest (Engel et al. 2013). We demonstrate that improvements in national institutions are fundamental to increasing the private scope. Yet, our results indicate that fostering a high-quality institutional environment can be complemented with several other factors that can increase private scope. To enhance private involvement in PPPs and cross-sector partnering more broadly, national governments should also promote the accumulation and enhancement of relevant public capabilities in public-private collaboration. Our study suggests that one possible way for governments to proceed, in tandem with efforts to improve the quality of institutions, is to start with simpler, low-scope PPPs in order to accumulate knowledge and experience in this particular form of collaboration. Over time, as both public and private actors develop experience in PPPs, we then expect an increase in private scope if the government manages to build institutions that will support an enlarged engagement by private investors in public-private collaboration.

Interestingly, for countries with a low level of institutional development, a set-up of more-targeted, structured PPP units may provide a viable way to at least partially mitigate or offset the negative effects of low institutional quality on private scope. As our results suggest, there is a certain

substitution effect with a proportionally larger role that such PPP units are likely to play in attracting private actor engagement in underdeveloped institutional contexts. This has important policy implications, as the need and value derived from PPP-dedicated governance units hence are likely to be vastly different based on the underlying institutional characteristics of the host country.

For firms engaged or interested in PPPs, we also outline critical factors that determine the private scope. If we assume that our observed firms are optimizing their scope decisions, the results lead us to make several recommendations: Managers should increase scope when the national institutional environment is strong. Firms with PPP joint-capital government partners should also increase the private scope in countries with high-quality institutions. Increased capabilities to deal with PPPs in a given industry should prompt firms to leverage their cumulative learning in both similar sectors and countries with more developed institutions. Last, in contrast, in countries with weaker institutions, enhancing country-specific private capabilities in PPPs may be immaterial if private actors cannot safely articulate and leverage these capabilities due to the volatile and uncertain nature of the local environment.

### **Limitations and Future Research Directions**

There remain important ways in which future research can refine and expand the results of the present study. To capture the degree of the private scope, we adopt an ordinal measure based on reported descriptions of each PPP. Future research could develop more direct, fine-grained measures of the private scope, such as the percentage of private ownership in each stage of the value chain and/or the nature of private involvement in each phase of the PPP. Our measures of prior experience and more-structured PPP units also represent a subset of possible attributes related to public and private capabilities in such partnerships. In addition, the size and composition of PPP units may vary according to the country; certain agencies may also be specialized in particular industries or types of public-private contracts. Gauging these more refined features can greatly contribute to the evolving literature on capabilities-based determinants of public-private interactions.

We also restrict our analysis to cases where PPPs were actually observed. That is, we do not assess projects involving pure public ownership or purely private operations. Future research could also examine the decision to engage in PPPs (instead of, say, complete state ownership) and how this

decision subsequently affects the choice of the private scope. This analysis would require building a database of national and international projects with and without public-private collaboration, which is beyond the scope of the present paper. There is also room to examine in detail the processes adopted by governments to structure PPPs with high private involvement. For instance, governments may invite private operations in early phases of the PPP to design the required infrastructure and then structure competitive auctions at later stages of the operation. In other words, the final observed degree of scope may result from sequential phases where governments try to attract and invite private investment. This research would not only improve our understanding of how public-private collaboration projects work, but also inform governments on how to attract private resources for successful execution of public projects.

Table 1. Detailed description of variables

| Variable type         | Name                                | Description   | Measurement   | Source          |
|-----------------------|-------------------------------------|---|---|-----------------|
| Dependent variable    | Private scope                       | Degree of involvement of private actors in the various activities of the PPP  | See Appendix 2 (below) and details on the survey with international experts (above).  | PFI, SDC        |
| Explanatory variables | Past PPPs executed in the country   | Public capabilities in public-private collaboration: cumulative capacity of public bodies to execute PPPs in a given sector   | Number of past PPPs executed by the country in the same sector as the PPP   | PFI, SDC        |
|                       | Specialized PPP unit                | Public capabilities in public-private collaboration: existence of a specialized government unit in the country to manage PPPs | Years since the establishment of the PPP unit   | Various sources |
|                       | Past PPPs executed by the firm      | Private capabilities in public-private collaboration: cumulative capacity of the firm to execute PPPs                         | Number of past PPPs executed by the private operator in the same country and sector of the PPP  | PFI, SDC        |
|                       | Ability to partner with governments | Private capabilities in public-private collaboration: revealed ability of the private actor to partner with governments       | Percentage of past PPPs in the same country in which the firm created an SPV funded by the local government   | PFI, SDC        |
|                       | Quality of institutions             | Institutional development of the country facilitating the enforcement of contracts with the public sector                     | Average of three indicators: quality of bureaucracy, absence of corruption, and transparency. We then create a dummy coded 1 if the country is above the median value of all countries, 0 otherwise | WCY             |
| Control variables     | Contract value                      | Total cost  | Value of the PPP (in thousand US\$) in logarithmic form   | PFI, SDC        |
|                       | Government partner                  | Whether the private firm is in association with local governments in the current PPP  | Dummy value equal to 1 if the local government participates as a sponsor of the SPV of the PPP, 0 otherwise   | PFI, SDC        |
|                       | Population                          | Size of the local market  | Population in logarithmic form  | WBDI            |
|                       | GDP per capita                      | Economic development (per capita income)  | GDP (in thousand US\$) divided by total population, in logarithmic form   | WBDI            |
|                       | Skilled labor                       | Perception of availability of skilled labor   | Measure from the WCY  | WCY             |
|                       | Competition legislation             | Perception of the existence of enforced competition legislation   | Measure from the WCY  | WCY             |
|                       | Financial development               | Ability to access sources of financing  | Measure from the WCY  | WCY             |
|                       | Credit availability                 | Availability of credit to the private sector  | Credit to the private sector as % of GDP  | WBDI            |
|                       | Government expenditures             | Extent of domestic government spending in the country   | Government expenditures as % of GDP   | WBDI            |
|                       | Year                                | Year-specific dummies   | Coded 1 if the project was signed in a given year, 0 otherwise  | PFI, SDC        |
| Sector                | Sector-specific effects             | Coded 1 if the project is in a given sector, 0 otherwise  | PFI, SDC  |                 |

Note: PFI: Private Finance International by Thomson Reuters; SDC: SDC Platinum Database by Thomson Reuters; WCY: IMD World Competitiveness Yearbook; WBDI: World Bank Development Indicators; SPV: special purpose vehicle.



Table 2. Summary statistics and correlations

|                              | Mean   | Std. Dev. | 1     | 2     | 3     | 4     | 5     | 6     | 7     | 8     | 9     | 10   | 11   | 12   | 13   | 14   | 15   |
|------------------------------|--------|-----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|------|------|------|------|
| 1.Private scope              | 1.986  | 0.594     | 1.00  |       |       |       |       |       |       |       |       |      |      |      |      |      |      |
| 2.Past PPPs in the country   | 17.601 | 30.388    | 0.02  | 1.00  |       |       |       |       |       |       |       |      |      |      |      |      |      |
| 3.Specialized PPP unit       | 9.562  | 6.032     | 0.15  | 0.22  | 1.00  |       |       |       |       |       |       |      |      |      |      |      |      |
| 4.Past PPPs by the firm      | 0.396  | 1.291     | 0.02  | 0.48  | 0.16  | 1.00  |       |       |       |       |       |      |      |      |      |      |      |
| 5.Ability to partner w/govts | 0.020  | 0.095     | 0.07  | 0.17  | 0.14  | 0.31  | 1.00  |       |       |       |       |      |      |      |      |      |      |
| 6.Quality of institutions    | 4.673  | 1.335     | 0.14  | 0.14  | 0.25  | 0.05  | 0.03  | 1.00  |       |       |       |      |      |      |      |      |      |
| 7.Contract value             | 2.263  | 0.561     | -0.09 | -0.10 | -0.28 | -0.09 | -0.10 | -0.07 | 1.00  |       |       |      |      |      |      |      |      |
| 8.Government partner         | 0.116  | 0.320     | 0.02  | -0.12 | 0.03  | -0.06 | 0.02  | 0.09  | 0.05  | 1.00  |       |      |      |      |      |      |      |
| 9.Population                 | 6.319  | 2.640     | -0.12 | -0.08 | -0.28 | -0.11 | -0.14 | -0.08 | 0.26  | -0.13 | 1.00  |      |      |      |      |      |      |
| 10.GDP per capita            | 9.757  | 0.917     | 0.13  | 0.39  | 0.34  | 0.19  | 0.14  | 0.58  | -0.10 | -0.02 | -0.25 | 1.00 |      |      |      |      |      |
| 11.Skilled labor             | 5.823  | 1.069     | -0.06 | 0.03  | -0.06 | 0.00  | -0.05 | 0.27  | 0.02  | -0.01 | 0.11  | 0.18 | 1.00 |      |      |      |      |
| 12.Comp. legislation         | 5.851  | 1.030     | 0.09  | 0.21  | 0.35  | 0.10  | 0.07  | 0.81  | -0.10 | 0.06  | -0.13 | 0.62 | 0.34 | 1.00 |      |      |      |
| 13.Financial development     | 6.056  | 1.578     | 0.04  | 0.19  | 0.14  | 0.04  | -0.03 | 0.71  | 0.03  | 0.01  | -0.04 | 0.50 | 0.22 | 0.68 | 1.00 |      |      |
| 14.Credit availability       | 1.006  | 0.507     | 0.13  | 0.55  | 0.30  | 0.27  | 0.10  | 0.36  | -0.17 | -0.02 | -0.18 | 0.64 | 0.05 | 0.42 | 0.39 | 1.00 |      |
| 15.Government expend.        | 0.369  | 0.112     | 0.12  | 0.17  | 0.46  | 0.10  | 0.12  | 0.35  | -0.20 | 0.08  | -0.16 | 0.54 | 0.17 | 0.42 | 0.19 | 0.23 | 1.00 |

Table 3. Determinants of private scope in PPPs: Ordered probit regression results

|  | Complete sample      |                      |                      |                      | Split sample         |                     |
|--|----------------------|----------------------|----------------------|----------------------|----------------------|---------------------|
|  |                      |                      |                      |                      | Low inst. qual.      | High inst. qual.    |
|  | (1)                  | (2)                  | (3)                  | (4)                  | (5a)                 | (5b)                |
| <i>Public capabilities in PPPs</i>                 |                      |                      |                      |                      |                      |                     |
| Past PPPs executed in the country                  |                      | -0.003<br>(0.002)    |                      | -0.003<br>(0.002)    | -0.008***<br>(0.002) | 0.004**<br>(0.002)  |
| Specialized PPP unit                               |                      | 0.021*<br>(0.011)    |                      | 0.021*<br>(0.012)    | 0.047***<br>(0.014)  | -0.004<br>(0.017)   |
| <i>Private capabilities in PPPs</i>                |                      |                      |                      |                      |                      |                     |
| Past PPPs executed by the firm                     |                      |                      | -0.019<br>(0.021)    | -0.003<br>(0.012)    | 0.011<br>(0.019)     | -0.012<br>(0.024)   |
| Ability to partner with governments                |                      |                      | 1.046**<br>(0.440)   | 1.083***<br>(0.371)  | 0.420<br>(0.313)     | 1.952***<br>(0.316) |
| <i>Institutional environment</i>                   |                      |                      |                      |                      |                      |                     |
| Quality of institutions                            | 0.240***<br>(0.054)  | 0.219***<br>(0.053)  | 0.241***<br>(0.055)  | 0.219***<br>(0.054)  | 0.188**<br>(0.093)   | 0.323***<br>(0.124) |
| <i>Control variables</i>                           |                      |                      |                      |                      |                      |                     |
| Contract value                                     | -0.031<br>(0.083)    | -0.012<br>(0.077)    | -0.032<br>(0.085)    | -0.012<br>(0.078)    | -0.082<br>(0.140)    | 0.038<br>(0.099)    |
| Government partner                                 | -0.04<br>(0.131)     | -0.036<br>(0.134)    | -0.048<br>(0.132)    | -0.043<br>(0.136)    | 0.199<br>(0.206)     | -0.260**<br>(0.124) |
| Population   | -0.009<br>(0.017)    | -0.004<br>(0.017)    | -0.008<br>(0.018)    | -0.003<br>(0.018)    | -0.011<br>(0.025)    | 0.013<br>(0.017)    |
| GDP per capita                                     | -0.079<br>(0.101)    | -0.035<br>(0.094)    | -0.078<br>(0.101)    | -0.033<br>(0.093)    | 0.018<br>(0.100)     | -0.081<br>(0.305)   |
| Skilled labor                                      | -0.166***<br>(0.038) | -0.145***<br>(0.040) | -0.161***<br>(0.037) | -0.139***<br>(0.040) | -0.072<br>(0.049)    | -0.155**<br>(0.069) |
| Competition legislation                            | -0.122*<br>(0.063)   | -0.158**<br>(0.063)  | -0.129**<br>(0.063)  | -0.167***<br>(0.064) | -0.250***<br>(0.086) | -0.271**<br>(0.111) |
| Financial development                              | -0.056<br>(0.042)    | -0.058<br>(0.037)    | -0.052<br>(0.043)    | -0.052<br>(0.037)    | -0.061<br>(0.050)    | -0.06<br>(0.079)    |
| Credit availability                                | 0.067<br>(0.132)     | 0.196<br>(0.127)     | 0.079<br>(0.130)     | 0.211*<br>(0.128)    | 0.174<br>(0.154)     | -0.161<br>(0.242)   |
| Government expenditures                            | 1.670**<br>(0.721)   | 1.293*<br>(0.705)    | 1.616**<br>(0.712)   | 1.228*<br>(0.713)    | -0.305<br>(0.581)    | 3.682**<br>(1.510)  |
| Year and sector dummies                            | Yes                  | Yes                  | Yes                  | Yes                  | Yes                  | Yes                 |
| <i>N</i>   | 1,003                | 1,003                | 1,003                | 1,003                | 490                  | 513                 |
| Wald test of model significance                    | $p < .001$           | $p < .001$           | $p < .001$           | $p < .001$           | $p < .001$           | $p < .001$          |
| Incremental pseudo $R^2$                           | 0.008                | 0.015                | 0.011                | 0.019                | 0.074                | 0.026               |
| Joint significance of added hypothesized variables | $p < .001$           | $p = .158$           | $p = .053$           | $p < .001$           | $p < .001$           | $p < .001$          |

\*\*\*  $p < .01$ ; \*\*  $p < .05$ ; \*  $p < .10$ . Robust standard errors in parenthesis, clustered on each country. Incremental pseudo  $R^2$  is above the model with control variables only.

Table 4. Robustness checks

|                                     | Adding count of past non-PPPs |                          | Quality variable from WGI <sup>a</sup> |                          | Changing the coding of scope <sup>b</sup> |                          |                         |                          |
|-------------------------------------|-------------------------------|--------------------------|--|--------------------------|---|--------------------------|-------------------------|--------------------------|
|                                     | Low inst. qual.<br>(6a)       | High inst. qual.<br>(6b) | Low inst. qual.<br>(7a)                | High inst. qual.<br>(7b) | Low inst. qual.<br>(8a)                   | High inst. qual.<br>(8b) | Low inst. qual.<br>(9a) | High inst. qual.<br>(9b) |
| <i>Public capabilities in PPPs</i>  |                               |                          |  |                          |   |                          |                         |                          |
| Past PPPs executed in the country   | -0.004<br>(0.004)             | 0.008***<br>(0.002)      | -0.003<br>(0.003)                      | 0.004**<br>(0.002)       | -0.002<br>(0.004)                         | 0.008***<br>(0.002)      | -0.004<br>(0.004)       | 0.008***<br>(0.002)      |
| Specialized PPP unit                | 0.049***<br>(0.014)           | -0.009<br>(0.017)        | 0.023*<br>(0.013)                      | -0.014<br>(0.017)        | 0.048***<br>(0.014)                       | 0.003<br>(0.019)         | 0.049***<br>(0.014)     | -0.007<br>(0.017)        |
| <i>Private capabilities in PPPs</i> |                               |                          |  |                          |   |                          |                         |                          |
| Past PPPs executed by the firm      | 0.010<br>(0.019)              | -0.016<br>(0.023)        | 0.008<br>(0.017)                       | -0.013<br>(0.023)        | 0.016<br>(0.024)                          | -0.028<br>(0.017)        | 0.012<br>(0.019)        | -0.017<br>(0.023)        |
| Ability to partner with governments | 0.389<br>(0.326)              | 1.984***<br>(0.331)      | 0.329<br>(0.320)                       | 2.031***<br>(0.261)      | 0.188<br>(0.246)                          | 1.958***<br>(0.309)      | 0.394<br>(0.336)        | 1.982***<br>(0.323)      |
| <i>Institutional environment</i>    |                               |                          |  |                          |   |                          |                         |                          |
| Quality of institutions             | 0.193**<br>(0.096)            | 0.323**<br>(0.130)       | 0.489***<br>(0.183)                    | 1.803***<br>(0.493)      | 0.204**<br>(0.093)                        | 0.374***<br>(0.116)      | 0.194**<br>(0.095)      | 0.331**<br>(0.132)       |
| <i>Control variables</i>            |                               |                          |  |                          |   |                          |                         |                          |
| Contract value                      | -0.083<br>(0.138)             | 0.022<br>(0.097)         | -0.110<br>(0.146)                      | -0.053<br>(0.114)        | -0.012<br>(0.135)                         | -0.041<br>(0.080)        | -0.083<br>(0.136)       | 0.025<br>(0.097)         |
| Government partner                  | 0.184<br>(0.206)              | -0.272**<br>(0.125)      | 0.237<br>(0.197)                       | -0.227*<br>(0.135)       | 0.261<br>(0.216)                          | -0.268***<br>(0.101)     | 0.198<br>(0.202)        | -0.297**<br>(0.127)      |
| Population                          | -0.01<br>(0.025)              | 0.015<br>(0.017)         | 0.009<br>(0.023)                       | 0.018<br>(0.016)         | -0.012<br>(0.023)                         | 0.013<br>(0.020)         | -0.007<br>(0.026)       | 0.013<br>(0.017)         |
| GDP per capita                      | -0.005<br>(0.109)             | -0.205<br>(0.291)        | -0.033<br>(0.141)                      | -0.433<br>(0.411)        | 0.047<br>(0.105)                          | -0.114<br>(0.307)        | -0.002<br>(0.109)       | -0.196<br>(0.291)        |
| Skilled labor                       | -0.077*<br>(0.047)            | -0.156**<br>(0.069)      | -0.142**<br>(0.055)                    | -0.239***<br>(0.063)     | -0.092**<br>(0.045)                       | -0.07<br>(0.055)         | -0.076<br>(0.047)       | -0.157**<br>(0.068)      |
| Competition legislation             | -0.254***<br>(0.086)          | -0.215*<br>(0.122)       | -0.255***<br>(0.084)                   | -0.337**<br>(0.160)      | -0.330***<br>(0.097)                      | -0.310**<br>(0.143)      | -0.246***<br>(0.088)    | -0.251**<br>(0.127)      |
| Financial development               | -0.066<br>(0.049)             | -0.117<br>(0.086)        | -0.077<br>(0.061)                      | 0.029<br>(0.097)         | -0.014<br>(0.051)                         | -0.014<br>(0.117)        | -0.068<br>(0.050)       | -0.124<br>(0.088)        |
| Credit availability                 | 0.212<br>(0.150)              | -0.044<br>(0.245)        | 0.049<br>(0.156)                       | 0.083<br>(0.220)         | 0.155<br>(0.147)                          | -0.129<br>(0.238)        | 0.199<br>(0.150)        | -0.075<br>(0.233)        |
| Government expenditures             | -0.168<br>(0.600)             | 3.872**<br>(1.517)       | -0.601<br>(0.538)                      | 1.211<br>(1.316)         | -0.286<br>(0.609)                         | 3.245**<br>(1.269)       | -0.188<br>(0.595)       | 3.802**<br>(1.505)       |
| Past non-PPPs by country            | -0.001<br>(0.001)             | -0.002***<br>(0.001)     | -0.001<br>(0.001)                      | -0.002**<br>(0.001)      | -0.001*<br>(0.001)                        | -0.002***<br>(0.001)     | -0.001<br>(0.001)       | -0.002***<br>(0.001)     |
| Year and sector dummies             | Yes                           | Yes                      | Yes                                    | Yes                      | Yes                                       | Yes                      | Yes                     | Yes                      |
| <i>N</i>                            | 490                           | 513                      | 379                                    | 368                      | 490                                       | 513                      | 490                     | 513                      |
| Wald test of model significance     | $p < .001$                    | $p < .001$               | $p < .001$                             | $p < .001$               | $p < .001$                                | $p < .001$               | $p < .001$              | $p < .001$               |

\*\*\*  $p < .01$ ; \*\*  $p < .05$ ; \*  $p < .10$ . Robust standard errors in parenthesis, clustered on each country.

<sup>a</sup> WGI: World Governance Indicators database; <sup>b</sup> Model 8 classifies LROT as 0, while model 9 classifies both BOT and LROT as 0 and the other types as 1 and 2.

Figure 1. Analytical model

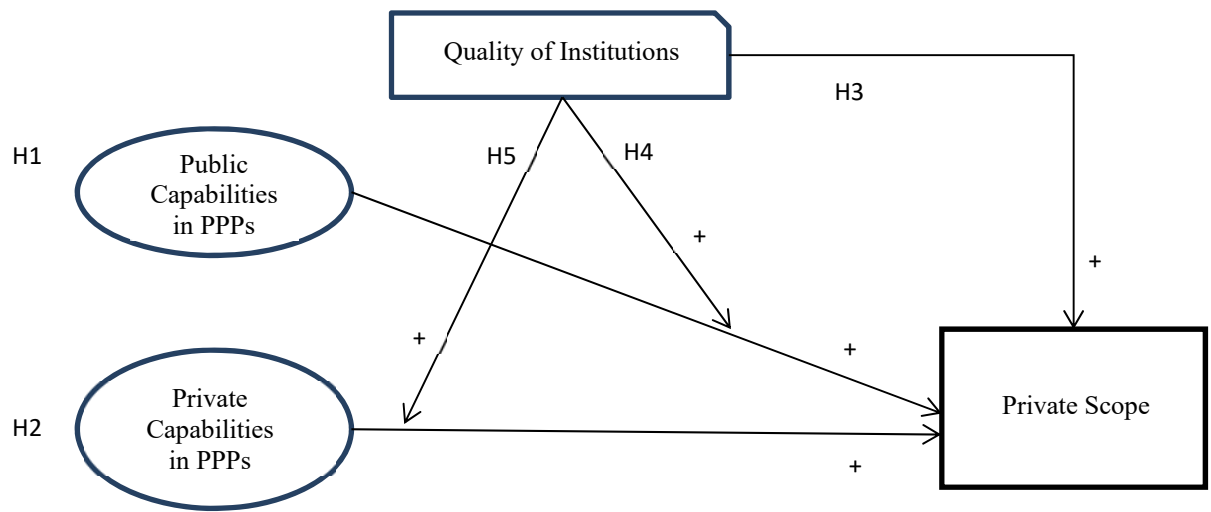
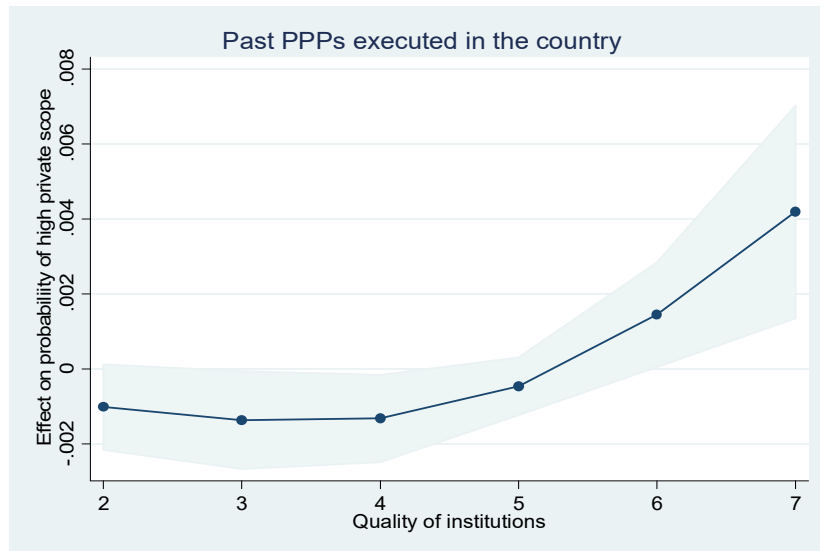
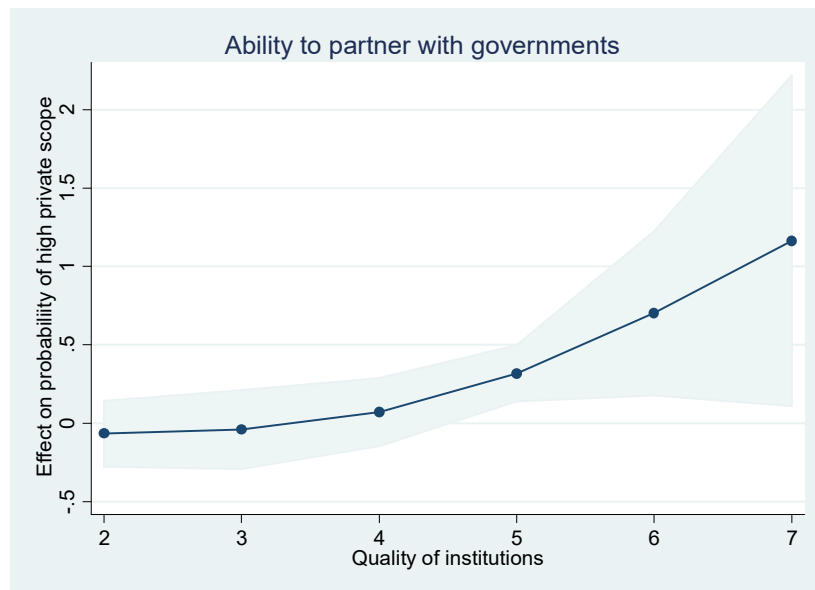
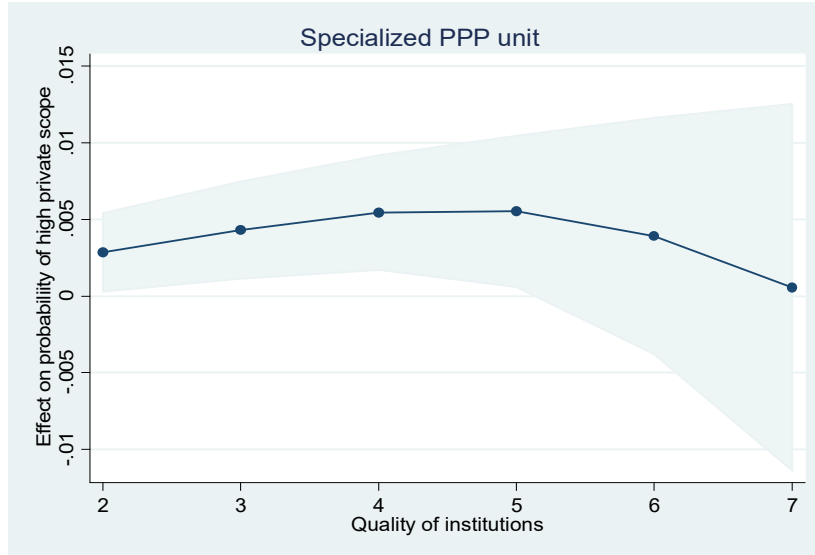


Figure 2. Marginal effects of key hypothesized variables on private scope, as a function of the quality of institutions (shaded areas indicate 95% confidence intervals)



[Continuation of Figure 2]



Appendix 1. Distribution of PPPs by region and sector

a. Region

| Region                           | %     |
|----------------------------------|-------|
| East Asia and Pacific            | 22.2  |
| Europe and Central Asia          | 44.5  |
| Latin American and the Caribbean | 9.8   |
| Middle East and North Africa     | 3.4   |
| North America                    | 15.1  |
| South Asia                       | 3.6   |
| Sub-Saharan Africa               | 1.5   |
| Total                            | 100.0 |

b. Sector

| Sector                                   | %     |
|--|-------|
| Construction and real estate             | 10.7  |
| Education                                | 12.3  |
| Energy                                   | 31.7  |
| Health                                   | 9.5   |
| Industrials                              | 10.9  |
| Information and communication technology | 6.0   |
| Security                                 | 2.5   |
| Transportation                           | 7.7   |
| Water and sewerage                       | 8.7   |
| Total                                    | 100.0 |

Appendix 2. Description of PPP types and degree of private involvement

| Type                                   | % in the database | Description  | Private scope |
|--|-------------------|--|---------------|
| BLT (Build-Lease-Transfer)             | 1.96%             | A private sponsor builds a new facility largely at its own risk, transfers ownership to the government, leases the facility from the government, and operates it at its own risk up to the expiry of the lease. The government usually provides revenue guarantees through long-term take-or-pay contracts for bulk supply facilities or minimum traffic revenue guarantees  | 0             |
| BOT (Build-Operate-Transfer)           | 12.00%            | A private sponsor builds a new facility at its own risk, operates the facility at its own risk, and then transfers the facility to the government at the end of the contract period. The private sponsor may or may not have (temporary) ownership of the assets during the contract period. The government usually provides revenue guarantees through long-term take-or-pay contracts for bulk supply facilities or minimum traffic revenue guarantees   | 1             |
| LROT (Lease-Renovate-Operate-Transfer) | 0.44%             | A contractual arrangement whereby an existing facility is handed over to a private sponsor on lease for a particular period of time for the specific purpose of renovating the facility and operating it for a specified period of time. It is on such terms and conditions as may be agreed to with the government for recovering the costs with an agreed return. Following the end of the contractual period, the facility is transferred back to the public sector   | 1             |
| BOO (Build-Operate-Own)                | 66.84%            | A private sponsor builds a new facility at its own risk, then owns and operates the facility at its own risk. The government usually provides revenue guarantees through long-term take-or-pay contracts for bulk supply facilities or minimum traffic revenue guarantees  | 2             |
| BOOT (Build-Operate-Own-Transfer)      | 3.79%             | A private sponsor builds a new facility at its own risk, then owns and operates the facility at its own risk (similar to the BOO model). However, it then transfers the facility to the government at the end of the contract period   | 2             |
| DBOT (Design-Build-Operate-Transfer)   | 0.63%             | A single contract is awarded to a private sponsor for the design, construction, and operation of a facility. Ownership title to the facility may temporarily reside with the private sector, but the facility is transferred back to the public sector at the end of the contact period  | 3             |
| DBFO (Design-Build-Finance-Operate)    | 14.34%            | In this type of contract, the responsibilities for designing, building, financing, and operating a facility are bundled together and transferred to private sector partners. There is a great deal of variety in DBFO arrangements, and especially the degree to which financial responsibilities are actually transferred to the private sector. One commonality that cuts across all DBFO projects is that they are either partly or wholly financed by debt-leveraging revenue streams dedicated to the project. Direct user fees are the most common revenue source, but others range from lease payments to shadow tolls and vehicle registration fees. The contractor assumes the risk of financing till the end of the contract period. Future revenues are leveraged to issue bonds or other debt that provide funds for capital and project development costs. They are also often supplemented by public sector grants in the form of money or contributions in kind, such as right-of-way | 3             |

Source: The World Bank/PPIAF; National Council for Public-Private Partnerships/GAO (USA); other sources.

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