1. The performance advantage of public-private partnerships: does it exist or not?

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INTRODUCTION

Research into Public-Private Partnerships (PPPs) has proliferated since the mid-2000s (Cui et al., 2018; De Castro e Silva Neto et al., 2016; Ke et al., 2009; Shi et al., 2020; Tang et al., 2010; Wang et al., 2018), with publications about PPPs originating primarily from the United Kingdom, the United States, Canada, Australia, and, increasingly, China and Europe (Chen et al., 2016; Cui et al., 2018; De Castro e Silva Neto et al., 2016; Ke et al., 2009; Wang et al., 2018). A core theme in this literature on PPPs is their performance (i.e., questions about the extent to which performance is achieved, how it can be achieved, and how it can or should be measured; Chen et al., 2016; Cui et al., 2018; De Castro e Silva Neto et al., 2016; Wang et al., 2018). These are no small questions, and they require our constant attention. The performance question of PPPs is a lingering one (Hodge & Greve, 2007, 2009, 2017; Palcic et al., 2019).

Different conceptions of PPP performance exist and they depend on, among other things, how the PPP phenomenon is defined and understood (Hodge & Greve, 2017; Wang et al., 2018). The definition of PPP as a Long-Term Infrastructure Contract partnership is today the most prominent one (Palcic et al., 2019). These contracts can be found in the development and management of both economic infrastructure (e.g., roads, bridges, ports, railways, airports, telecommunications, and power) and social infrastructure (e.g., schools, hospitals, water supply, housing, sewerage, sports facilities, and care; Grimsey & Lewis, 2004). In this definition, PPPs are commonly understood as a “single project” or as a “specific type of infrastructure delivery mechanism with a specific institutional and financial structure in place to initially fund and deliver construction works as well as operate the long-term facility” (Hodge & Greve,
Performance definitions focus on project success and the delivery of projects in terms of on-budget, on-time, and on-quality delivery (Hodge & Greve, 2017). In this “narrow” definition of partnership performance, the focus is on “the achievement of particular service or outcome targets as set out in the partnership agreement (strategy, contract, business plan) and assessed in relation to other factors such as the cost of the partnership’s operations” (Jeffares et al., 2013, p. 170).

The present book deals with this narrow definition of partnership performance. Although the label “narrow” here could connote a certain level of simplicity, the evaluation of this performance is not an easy or straightforward task (Jeffares et al., 2013). One important challenge is that project-level data remain hard to come by (Chen et al., 2016; Jeffares et al., 2013). Another challenge relates to evaluation rigor and, in particular, the counterfactual situation of “‘traditional procurement’ [that] is both horribly vague and also largely unquantified in most assessments” (Hodge, 2010, p. 102). This is an important challenge and one that we posit—as a consequence of the changing motivations of governments to opt for PPPs—has become more important over time.

Core motivations of governments to develop and manage the delivery of infrastructure through PPPs used to focus on increasing the efficiency of public service delivery, the transfer of risks to the private sector, and on reducing the budget and borrowing constraints of governments by using private sector funds (McQuaid & Scherrer, 2010). In many developing countries, these are still core motivations for PPPs (World Bank, 2014, 2017; e.g., Debela, 2019; Kavishe & Chileshe, 2020; Osei-Kyei et al., 2014). However, in general and for developed countries in particular, McQuaid and Scherrer (2010) predicted that “issues concerning the efficiency and effectiveness of PPPs, compared to their alternatives, are likely to increase in importance while budget enlarging motivations decrease” (2010, p. 27, emphasis added). For instance, the European PPP Expertise Centre (2015) identified the potential of PPPs to improve Value for Money (VfM) as the most important motivation for using PPPs and defined “improving VfM” as “using PPPs where they can improve the delivery of benefits relative to the associated costs across a range of alternatives” (p. 5, emphasis added).

So, it appears the idea that PPPs outperform—or achieve added value over—traditional infrastructure procurement (i.e., the alternative) is nowadays a core motivation of policymakers and infrastructure planners to develop and manage infrastructure through PPPs. This idea is what we call in this book the performance advantage. The performance advantage is the idea that when an infrastructure project is developed and managed through a PPP, this results in greater performance compared to the development and management of that project through an alternative type of infrastructure delivery mechanism—the counterfactual situation—that is not a PPP. This idea of a performance advan-
The performance advantage of public-private partnerships is also at the basis of the planning of infrastructure projects. When infrastructure projects are planned, the PPP option is benchmarked against a traditional alternative using methods such as the Public Sector Comparator (PSC) or business case projections of PPPs (Petersen, 2019). The PSC is the “benchmark cost of providing the specified service with traditional procurement” (Grimsey & Lewis, 2004, p. 137). It involves the comparison—prior to the implementation of a project—of this benchmark with the costs of implementing the project through a PPP (Grimsey & Lewis, 2005).

In this book, we take issue with this idea of a performance advantage of PPPs and argue that little is known about the extent to which it actually exists (Verweij, 2018). We identify at least three reasons for this. First, the PPP literature tends to be dominated by single case studies (Hueskes et al., 2019; Osei-Kyei & Chan, 2015; Tang et al., 2010; Zhang et al., 2016). The advantages of single case studies notwithstanding, this approach lacks a structured comparison between infrastructure development and management with and without PPPs. Second, the counterfactual situation is often vague and underspecified (Hodge, 2010). Many applications of the PSC are said to be flawed because the parameters and assumptions are set in such a way that the results of the comparison are often biased in favor of PPPs (Boardman & Hellowell, 2017; Boers et al., 2013). Comparing the PPP option to business case projections is then another approach; these projections are often more transparent (Petersen, 2019), which makes it possible to scrutinize the parameters and assumptions. Yet, the problem with comparing the PPP option to the benchmark or a business case projection is that the latter involve ex-ante expectations of performance. This means that it remains unclear whether the prospected performance advantages actually materialized (Boers et al., 2013; Petersen, 2019). This problem is exacerbated, third, by the fact that real project data are often hard to get because the data are not publicly available and are restricted due to confidentiality issues (Chen et al., 2016). The extent to which PPPs outperform traditional infrastructure procurement therefore remains a largely unanswered question (Petersen, 2019). What is needed are evaluations that compare the actual performance of PPPs with that of other types of procurement. Because policymakers and infrastructure planners continue to appeal to the idea that PPPs add value over other types of procurement, a critical assessment of this idea is much needed (Hodge & Greve, 2007, 2017; Petersen, 2019). This brings us to the aims of this book.

AIMS OF THE BOOK

This book questions the extent to which the performance advantage of PPPs exists (or not). It has two main objectives. First and most important, this book critically assesses and empirically explores the existence of a performance...
advantage of PPPs. To that purpose, it presents new comparative empirical studies of the performance advantage in various countries, including Brazil, India, Ireland, the Netherlands, Portugal, and Spain. We also discuss studies that have analyzed the performance advantage of PPPs (see “Current Literature” below). These published studies cover additional countries: Colombia, Costa Rica, Indonesia, Lebanon, Pakistan, Scotland, South Korea, the United Kingdom, and the United States. Second, this book explores explanations for why the performance advantage of PPPs exists (or not). In this respect, it also engages with the questions of why and how the performance advantage may be achieved. PPPs are infrastructure delivery mechanisms and, from the perspective of governments, an important tool for the delivery of public services. How this can be achieved successfully—and better than the traditional alternative against which it was assessed to have added value—therefore matters. By going deeper into these underlying explanations and mechanisms, this book offers important conclusions and recommendations concerning the potential advantages and limitations of PPPs in achieving good performance.

With this book, we want to cater to PPP researchers and students in general, and to scholars and students who work on research examining the performance of PPPs in particular. These scholars and students come from different disciplines. Although PPPs are studied most often by Public Administration, Public Management, and/or Public Policy scholars (Marsilio et al., 2011), we also believe that this book bears relevance to scholars and students from Transport and Infrastructure Planning, Engineering, and Project Management, which are other important disciplines that study PPPs (Shi et al., 2020). Empirically, this book includes contributions from different policy sectors—schools, hospitals, sports, and transport—and PPP researchers and students in these areas may also find this book of value.

This book also caters to policymakers. It engages with the expectations of policymakers that PPPs add value over (i.e., outperform) traditional infrastructure procurement. PPPs are popular with policymakers. In some regions, such as Europe, we see the number of PPP deals and size of investments decreasing and there are increasing discussions about why, when, and in which form to proceed with large-scale Design–Build–Finance–Maintain (DBFM) projects (e.g., European PPP Expertise Centre, 2020). This is, for instance, the case in the Netherlands (Koppenjan et al., 2020; Rijkswaterstaat, 2019; Verweij et al., 2021). In other regions, and especially in Emerging Markets and Developing Economies (EMDEs), PPPs remain very popular (e.g., World Bank, 2020; Casady & Peci, 2021; Casady, 2021). Our book can inform policymakers and planners about whether to opt for PPPs over traditional procurement and, specifically, on which performance indicators PPPs outperform traditional procurement and on which they do not. Because our book also focuses on the reasons why (or not) the performance advantage exists, this can inform
policymakers and planners about the ways in which the expected outcomes of PPPs may be achieved. But how should we assess the performance advantage of PPPs?

ASSESSING THE PERFORMANCE ADVANTAGE OF PUBLIC-PRIVATE PARTNERSHIPS

Because governments are often in the position to borrow money at low or risk-free rates, PPPs normally come with higher costs related to private financing; but the expectation is that this is made up for by risk transfer to—and risk management skills of—the private sector partner (Leruth, 2012). Whether the higher costs are justified by the greater performance potential of a PPP compared to traditional procurement is difficult to assess (Petersen, 2019). Yescombe (2013) even stated that:

Proving the case either way ex-ante for any particular project is virtually impossible since such a proof depends on unprovable assumptions on risks and costs stretching forward for many years (not just construction but also operation, maintenance and lifecycle/renewal costs), and equally ex-post proof is also impossible since a PPP project that did happen cannot be compared with a public procurement that did not. (p. 228)

We agree with this statement. However, this should not discourage us from pursuing a critical assessment of the existence of the performance advantage. It is a core motivation of policymakers to opt for PPPs in the development and management of infrastructure and, as such, requires our critical reflection. It also means that our effort will be important yet necessarily humble.

How the performance advantage can then be assessed thus involves the question of what an appropriate counterfactual situation is. We already ruled out the PSC and business case projections because these concern ex-ante assessments. The next best thing is to compare PPPs “using benchmark data collected for comparable projects of similar type, size, complexity, etc.” (Petersen, 2019, p. 230). In this respect, we fully agree with Petersen (2019), who points out that from a “strict evaluation perspective, this approach is in many ways preferable as it represents a more suitable design for constructing control groups and establishing a counterfactual situation” (p. 230).

Using Benchmark Data of Comparable Projects

This book collects studies using benchmark data of comparable projects to assess the performance advantage of PPPs. All studies thus use a similar general design: a quasi-experimental design comparing the performance of
PPP projects with a “control group” of infrastructure projects not procured as PPPs.

This evaluation approach undoubtedly also comes with its limitations and challenges. Most importantly, it is challenging to find a proper control group with comparable benchmark data—in this case: infrastructure projects of similar complexity and size, as well as those developed in comparable eras and within similar institutional frameworks and legal systems. Because project risks, complexity, institutional frameworks, and legal systems may differ considerably across countries and sectors and over time (Casady, 2021; Casady et al., 2020; Hammerschmid & Ysa, 2010; Soecipto et al., 2016), this book presents empirical comparative studies that each focus on a single country, a single infrastructure sector (e.g., roads, schools, or hospitals), and a relatively short timeframe. Hence, we increase the comparability (i.e., improve the suitability of the counterfactual situation) of PPP projects with the traditional alternative. It does not mean that the comparability will be perfect (Petersen, 2019). It does mean, though, that this approach is better able to assess the impact of the specific type of infrastructure delivery mechanism (i.e., PPP or not) on the performance. In that way, we increase the chance that differences in performance can be explained by the type of contract and governance structure rather than other intervening variables. In other words, it allows us to be more certain that the difference in performance (if it exists) between two groups of projects—the PPP versus the traditional alternative—can be interpreted as a performance advantage, or the non-existence thereof. Moreover, it requires that we pay attention to the mechanisms of and possible explanations for any differences.

PERFORMANCE OF PUBLIC-PRIVATE PARTNERSHIPS: DIMENSIONS COVERED IN THIS BOOK

There are many different dimensions and definitions of PPP performance, depending on the specific objectives of the PPPs, the particular meaning of PPPs, the level of analysis one takes, the theoretical and evaluative frameworks applied, and the disciplinary perspective assumed (Hodge & Greve, 2017; Jeffares et al., 2013). This book deals with the narrow definition of partnership performance, focusing on the project level (see the Introduction to this chapter). Hence, it focuses on three dimensions of performance that are commonly used to assess PPP project success: cost performance, time performance, and service quality performance (Hodge, 2010; Hodge & Greve, 2017; Petersen, 2019). Cost performance generally concerns operational costs, capital costs, total (whole-life) project costs including design and construction costs, and on-budget delivery (Hodge, 2010; Petersen, 2019). Time
performance focuses on whether projects and services were delivered on time according to the initially planned or agreed upon schedule (Hodge, 2010). Service quality performance relates to VfM, which is achieved when PPPs deliver “improved services for the same amount of money as the public sector would spend to deliver a similar project” (Grimsey & Lewis, 2005, p. 346). It is about optimizing the whole-life project costs and quality (Yaya, 2017). Because many studies focus not necessarily on the relationship between costs and quality, but also on the quality of service delivery in itself, and because the quality of services may refer to different things depending on the policy sector and types of projects, we focus on service quality as one dimension of the performance of PPPs.

CURRENT LITERATURE

Let us first consider what is already available. Studies have been conducted on the materialized performance differences between PPPs and traditional procurement methods by benchmarking PPP projects with data collected for comparable projects (e.g., Liu et al., 2014; Petersen, 2019). A well-known example is the study by Raisbeck and Duffield into the comparative performance of PPPs and traditional procurement in Australia (Allen Consulting Group, 2007; Duffield, 2008; Raisbeck et al., 2010). Their study analyzed 21 PPP projects and 33 traditional projects—social infrastructure, transport infrastructure, water infrastructure, and information technology infrastructure—and found that PPPs outperformed traditional procurement in terms of cost performance (cf. Duffield, 2008). In terms of time performance, they found that PPPs are generally delayed during the period prior to, but only have a very small delay on average after, financial close. In contrast, traditionally procured projects take, on average, less time than anticipated in the period prior to project execution but have frequent delays in the construction phase (Duffield, 2008). Another example is the international study conducted by Gassner et al. (2009) and published by the World Bank. This study found that the PPP projects outperformed—in terms of the quality of the delivery of electricity and water distribution and in terms of productivity—the projects that remained state-owned and state-operated. A third example is a study by Bel et al. (2010) who, based on a meta-analysis of studies from North America, Europe, Asia and the Pacific, and Africa, did not find evidence of lower costs of water distribution and solid waste collection services through private sector participation. Finally, a study by Chasey and colleagues (2012) comparatively analyzed the cost and time performance of North American (i.e., United States and Canada) PPP projects, on the one hand, and Design–Bid–Build (DBB) or Design–Build (DB) projects on the other. They found that the PPPs performed
better. However, these examples did not focus on a single country and a single infrastructure sector.

Cost Performance

Petersen (2019) identified just over a handful of studies in which PPP cost and VfM performance were benchmarked with the performance of a counterfactual situation (i.e., traditional procurement of public projects) and that also focused on only one country and one infrastructure sector (Daito & Gifford, 2014; Froud & Shaoul, 2001; Hong, 2016; Pollock et al., 2002; Reeves & Ryan, 2007; Whittington, 2012; Yaya, 2017). In their study of hospitals in the United Kingdom, Shaoul and colleagues found that PPPs are more costly than existing public facilities in capital terms (Froud & Shaoul, 2001; Pollock et al., 2002). Reeves and Ryan (2007) studied schools in Ireland and concluded that PPPs are more costly than traditional procurement and that the VfM (based on costs) was also lower for the PPP projects. Yaya (2017) investigated schools in Scotland and found that “a higher percentage of headteachers of conventionally financed schools (63.64 percent) considered their new schools resulted in good VfM compared to PPP schools (42.86 percent)” (p. 187). Whittington (2012) compared two road projects from the United States—one Design–Build–Finance–Maintain–Operate (DBFMO) project with a focus on the DB phase and one bid–build contract—and found that the projects had no significant differences in cost performance. In another study of road infrastructure projects from the United States, Daito and Gilford (2014) studied 53 Design–Build–Finance–Operate–Maintain (DBFOM) projects and found that they were more costly than DB projects; they also found that there was no significant difference between the VfM of the PPPs and of the traditionally procured projects. Hong (2016), finally, studied two urban rail projects in Seoul, South Korea, and did not find any evidence that the privately financed and operated Build–Transfer–Operate (BTO) project had a cost-efficiency advantage compared to the publicly owned and operated rail system. What these studies reviewed by Petersen (2019) thus indicate is that PPP projects are more costly than traditionally procured projects.

We have identified from the literature some more publications that comparatively analyzed the real cost performance differences between PPP projects and traditionally procured projects. A few studies focused on cost performance in the construction and implementation phases of the projects (Atmo et al., 2017; Dos Reis & Cabral, 2017; Verweij & Van Meerkerk, 2020, 2021). The work by Atmo et al. (2017) on Indonesian power plants analyzed cost performance understood as cost escalations compared to the initially agreed contract price that resulted from contract renegotiations after the contract close. The authors did not find significant differences between the Design–Build–Finance–
Operate (DBFO) projects and the Engineering, Procurement, and Construction (EPC) projects that they compared. Verweij and Van Meerkerk (2020, 2021) studied cost performance in a similar way for Dutch transportation projects (see also Verweij et al., 2020a, 2020b). They collected financial data about the additional work costs occurring in the Design and Construct (D&C) phases of DBFM and D&C projects. They did find that DBFM projects, compared to the D&C projects, had a significantly better cost performance in terms of lower additional work costs. Dos Reis and Cabral (2017) found that sports arenas in Brazil procured via DBFO had a better cost-per-seat ratio than the traditionally procured arenas and that they had better compliance to the initial costs forecast (i.e., cost overrun).

Other studies focused on the cost performance differences in the operation and maintenance phases of projects (Archambeault & Deis, 1997; Cabral & De Azevedo, 2008; Massoud et al., 2003), or on the total project costs (Meduri & Annamalai, 2013). Archambeault and Deis (1997) found that privately operated prisons in the state of Louisiana, United States, were operated more cost effectively than the prison operated through the traditional public model. Cabral and De Azevedo (2008) came to a similar conclusion. In their comparative study into prisons in the state of Bahia, Brazil, they found that the privately operated prison had lower staff costs, utilities costs, and lower maintenance costs compared to the public counterpart. Conversely, Massoud and colleagues (2003) found that the privately operated Design–Build–Operate–Transfer (DBOT) solid waste management facility in Lebanon had higher operating costs per capita and costs per ton than the publicly operated facility. Finally, the study of Meduri and Annamalai (2013) focused on total project costs or cost overrun. Their comparative analysis of 521 Indian transport projects showed that the Build–Operate–Transfer (BOT) projects were significantly more expensive than the projects procured through the traditional public model. When these costs were calculated in terms of costs per lane-kilometer, however, the PPP projects had better performance.

Table 1.1 gives an overview of the existing studies on the cost performance advantage, indicating that the evidence is mixed. Some studies find that PPPs performed better. Others, however, found that the PPPs performed worse or that there were no significant differences.

**Time Performance**

We identified a number of studies in which the time performance advantage of PPPs, for a single country and a single infrastructure sector, was evaluated. A few of these studies analyzed economic infrastructure projects. The aforementioned study by Atmo et al. (2015, 2017) into Indonesian power plants found that the actual construction time, compared to the planned construction
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<td>Archambeault and Deis (1997)</td>
<td>1991–96</td>
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<td>Prisons</td>
<td>Cost effectiveness</td>
<td>Privately operated prisons were more cost-effective</td>
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<td>Froud and Shaoul (2001); Pollock et al. (2002)</td>
<td>1998–2000</td>
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<td>The PPPs were more costly in capital terms (Petersen, 2019)</td>
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<td>Massoud et al. (2003)</td>
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<td>Reeves and Ryan (2007)</td>
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<td>Cabral and De Azevedo (2008)</td>
<td>2003–2004</td>
<td>Brazil</td>
<td>Prisons</td>
<td>Staff costs, utilities costs, and maintenance costs</td>
<td>Costs were higher in the publicly operated prison</td>
<td>Positive</td>
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<td>Whittington (2012)</td>
<td>1998–2005</td>
<td>United States</td>
<td>Roads</td>
<td>Design costs, change order costs, and cost overrun</td>
<td>PPP project had lower costs on all indicators, but no significant difference (Petersen, 2019)</td>
<td>Positive/No</td>
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<td>Study</td>
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<td>Meduri and Annamalai (2013)</td>
<td>1996–2010</td>
<td>India</td>
<td>Roads, Bridges</td>
<td>Total project costs and costs per lane-kilometer</td>
<td>PPP projects were more expensive but had significantly lower costs per lane-kilometer</td>
<td>Positive</td>
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<td>Daito and Gifford (2014)</td>
<td>1991–2013</td>
<td>United States</td>
<td>Roads</td>
<td>Construction costs and cost efficiency</td>
<td>PPPs had higher construction costs, but no significant difference in cost efficiency (Petersen, 2019)</td>
<td>Negative/No</td>
</tr>
<tr>
<td>Hong (2016)</td>
<td>2000–2013</td>
<td>South Korea</td>
<td>Urban Rail</td>
<td>Costs service operation</td>
<td>No evidence that private operation had lower operation costs (see also Petersen, 2019)</td>
<td>No</td>
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<td>Atmo et al. (2017)</td>
<td>2000–2014</td>
<td>Indonesia</td>
<td>Power Plants</td>
<td>Project costs compared to contracted price</td>
<td>No significant difference</td>
<td>No</td>
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<td>Dos Reis and Cabral (2017)</td>
<td>2010–2014</td>
<td>Brazil</td>
<td>Sports Stadiums</td>
<td>Provision costs: compliance with initial cost forecast and cost per seat</td>
<td>PPPs had better performance on both indicators</td>
<td>Positive</td>
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<td>Study</td>
<td>Period</td>
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<td>Yaya (2017)</td>
<td>2000–2012</td>
<td>Scotland</td>
<td>Schools</td>
<td>VfM</td>
<td>The study found that “more headteachers in conventional schools agreed that VfM has been achieved” (Petersen, 2019, p. 237)</td>
<td>Positive</td>
</tr>
<tr>
<td>Verweij and Van Meerkerk (2020, 2021)</td>
<td>2008–2017</td>
<td>Netherlands</td>
<td>Roads</td>
<td>Additional work costs during D&amp;C phase</td>
<td>PPPs had significantly better cost performance</td>
<td>Positive</td>
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time as detailed in the construction contracts, was lower in PPPs than in traditionally procured projects. In their larger-N analysis of 56 projects, they were also able to conclude that this performance difference was statistically significant (Atmo et al., 2017). Verweij and Van Meerkerk (2021) found that the Dutch DBFM transport infrastructure projects had a better implementation time (i.e., less implementation delay) of the D&C phases than the projects with D&C contracts, although the difference was not statistically significant. In an updated analysis, however, that included additional data points (for the year 2018), they concluded that the difference was significant (Verweij et al., 2020a). Whittington (2012), finally, concluded that the PPP project that he studied was built quicker and earlier than the bid–build contract he compared it with.

Other researchers have focused on the analysis of social infrastructure projects. In their study of Brazilian sports arenas, Dos Reis and Cabral (2017) found that the PPP projects, except one, had better stadium delivery times—defined as delivery on or before the contracted delivery date—than the other projects. The bidding process was also shorter in most PPP projects. O’Shea et al.’s (2019) comparative study of Irish schools indicated that, although the tendering process for the DBFM case was rather long, its construction time was shorter than that of the D&C case. A similar conclusion was reached by Rodrigues and Zucco (2018) for schools in the City of Belo Horizonte in Brazil. They found that the schools with BOT contracts had significantly better time to delivery than the schools with D&C contracts.

Table 1.2 gives an overview of studies on the time performance advantage, indicating that PPPs indeed seem to have an advantage over traditionally procured infrastructure projects.

**Service Quality Performance**

Lastly, we have identified from the literature multiple studies that focused on the comparison of service delivery quality between PPPs and traditionally procured projects. Depending on the policy sector studied and the data collected, the quality of the service delivery was defined in widely different ways. A few studies focused on economic infrastructure projects (Atmo et al., 2015, 2017; Massoud et al., 2003). Atmo et al. (2015, 2017) looked at the availability of the power plants and their carbon emission levels during the first two years of their operation. Their small-N study suggested that the DBFO projects had better performance than the EPC projects (Atmo et al., 2015). This was later confirmed for plant availability in their larger-N statistical analysis, concluding that the difference between DBFO and EPC was significant in favor of DBFO (Atmo et al., 2017). The study by Massoud et al. (2003) into Lebanese waste management facilities found that, although the PPP case had higher operating...
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<tr>
<td>Whittington (2012)</td>
<td>1998–2005</td>
<td>United States</td>
<td>Roads</td>
<td>Construction time</td>
<td>PPP project was built earlier and took less time</td>
<td>Positive</td>
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<td>Atmo et al. (2015, 2017)</td>
<td>2004–2011; 2000–2014</td>
<td>Indonesia</td>
<td>Power Plants</td>
<td>Actual construction time compared to planned time in contract</td>
<td>PPP projects were completed faster and delay was significantly lower</td>
<td>Positive</td>
</tr>
<tr>
<td>Dos Reis and Cabral (2017)</td>
<td>2010–2014</td>
<td>Brazil</td>
<td>Sports Stadiums</td>
<td>Delivery time</td>
<td>PPP projects had better delivery times with one exception</td>
<td>Positive</td>
</tr>
<tr>
<td>Rodrigues and Zucco (2018)</td>
<td>2009–2015</td>
<td>Brazil</td>
<td>Schools</td>
<td>Construction time: time to delivery from starting construction</td>
<td>PPP projects had significantly better time to delivery</td>
<td>Positive</td>
</tr>
<tr>
<td>O'Shea et al. (2019)</td>
<td>2012–2016</td>
<td>Ireland</td>
<td>Schools</td>
<td>Duration of tendering process and construction period</td>
<td>PPP tendering process was longer, but the construction was faster</td>
<td>Positive</td>
</tr>
<tr>
<td>Verweij and Van Meerkerk (2021); Verweij et al. (2020a)</td>
<td>2008–2017; 2008–2018</td>
<td>Netherlands</td>
<td>Roads</td>
<td>Actual implementation time of D&amp;C phase compared to planned time at contract close</td>
<td>PPP projects had significantly better time performance</td>
<td>Positive</td>
</tr>
</tbody>
</table>
The performance advantage of public-private partnerships costs than the publicly operated facility (see "Cost Performance," above), this also resulted in "increased performance efficiency and environmental protection improvements" (p. 23).

Most studies to this effect, however, have focused on social infrastructure projects, such as health services (Cercone et al., 2005; Ferreira & Marques, 2021; Gauri et al., 2004; Shet et al., 2011), schools (Barrera-Osorio, 2007; Hafeez et al., 2016; Rodrigues & Zucco, 2018; Yaya, 2017), and prisons (Archambeault & Deis, 1997; Cabral et al., 2010, 2013; Cabral & De Azevedo, 2008). The study by Cercone and colleagues comparatively analyzed seven health care clinics in Costa Rica (Cercone et al., 2005; Gauri et al., 2004). They looked at two sets of service quality performance indicators: target coverage rate (e.g., pap smears, diagnosis and treatment of hypertension and diabetes patients, and prenatal visits) and clinical-level outputs (e.g., clinical visits, mortality rates, and medications). They found that the clinics with contracted private service providers outperformed the public ones on five of seven of the target coverage rate indicators. Regarding the clinical-level outputs, they found that the private ones conducted more general practitioner visits (but fewer specialist visits) and that they provided less-costly healthcare at similar or increased levels of quality. The study offered nuanced conclusions, showing that the PPP model for health care clinics “substituted generalist for specialist services…but did not turn away new patients, refuse emergency cases, or substitute nurses for doctors as care providers” (Gauri et al., 2004, p. 292). Overall, the study suggested that the privately operated clinics were able to "combine advantages of public and private approaches to health care service provision” (p. 292). Shet et al. (2011) analyzed HIV health care facilities in India, comparing three clinics: a public model, a private model, and a public-private model. They looked at a variety of performance indicators, including treatment interruptions, waiting times, adherence barriers, and viral load. Their study showed that the main difference was between the public and public-private clinics on the one hand and the private one on the other, concluding that “adherence and treatment success was significantly higher among patients from public and public-private settings compared with patients from private facilities” (Shet et al., 2011, p. 1). Ferreira and Marques (2021) investigated differences in social performance levels between public hospitals and PPP hospitals with a Design–Build–Finance–Operate–Transfer (DBFOT) contract in Portugal. Having comparatively analyzed a total of 2660 observations, they concluded that differences between the public and PPP hospitals are not considerable.

As previously indicated, a couple of studies focused on schools. Barrera-Osorio (2007) analyzed schools in the City of Bogota, Colombia, comparing PPP schools or private schools providing public education for 15 years with public schools. He looked at indicators such as student dropout rates
and educational outcomes in terms of test scores on reading and mathematics. His analysis found that the PPP schools had significantly lower dropout rates, and that students in the PPP schools had significantly better test scores on both school subjects. Hafeez and colleagues (2016) analyzed schools in the city of Karachi, Pakistan. They compared PPP schools to public sector schools, focusing on student test scores for mathematics, English, and the average scores across subjects. Like Barrera-Osoria (2007), they also found that the PPP schools performed significantly better. Rodrigues and Zucco’s (2018) analysis of Brazilian schools found that, in addition to better time performance (see "Time Performance," above), the schools also had better quality performance. Specifically, principals of the PPP schools spent significantly more time on pedagogical activities, and they were significantly more satisfied with six out of ten of the operational services, such as response time, quality of maintenance, and quality of operational supplies and materials (e.g., cleaning supplies and toilet paper). Finally, Yaya (2017) compared Private Finance Initiative (PFI) schools with conventionally financed schools in Scotland, looking at the quality and satisfaction with newly built primary school buildings in terms of, inter alia, building quality, service quality, maintenance mechanism, and building condition and suitability. The study found that the results are mixed, but mostly positive in favor of PPP schools (Petersen, 2019), although most differences were not significant.

Some studies also focused on prisons. Archambault and Deis (1997) found that the privately run prisons in Louisiana were not only more cost-effective (see "Cost Performance," above), but also had better service quality performance in terms of public safety, staff safety, and inmate safety. The studies by Cabral and colleagues (2008, 2010, 2013) into Brazilian prisons focused on performance indicators related to security and order—in terms of attempted prison escapes and prison deaths—and service to inmates—in terms of medical care, psychological care, and legal aid. They found that the prisons under private service contracts had significantly lower numbers of attempted escapes and deaths, as well as significantly better legal aid in terms of legal efficiency (Cabral et al., 2010, 2013). The frequency of the services to inmates was also higher in the privately run prison (Cabral et al., 2010; Cabral & De Azevedo, 2008).

Table 1.3 provides an overview of these studies regarding service quality performance. The table makes clear that PPPs have a performance advantage over the traditional alternatives. The results for the cases of health care and education were more mixed, but still generally in favor of the PPP model.
<table>
<thead>
<tr>
<th>Study</th>
<th>Period</th>
<th>Country</th>
<th>Sector</th>
<th>Performance Category</th>
<th>Findings</th>
<th>Performance Advantage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Archambeault and Deis (1997)</td>
<td>1991–96</td>
<td>United States</td>
<td>Prisons</td>
<td>Public safety, staff safety, and inmate safety</td>
<td>Privately operated prisons had generally better safety performance</td>
<td>Positive</td>
</tr>
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<td>Massoud et al. (2003)</td>
<td>1996–97</td>
<td>Lebanon</td>
<td>Waste Management</td>
<td>Performance efficiency and environmental protection improvements</td>
<td>PPPs seemed to have higher performance (but also higher costs; see Table 1.1)</td>
<td>Positive</td>
</tr>
<tr>
<td>Cercone et al. (2005); Gauri et al. (2004)</td>
<td>1990–1999, 2000</td>
<td>Costa Rica</td>
<td>Health Care Clinics</td>
<td>Target coverage rate and clinical level outputs</td>
<td>Clinics with contracted private provision outperformed public prisons on five of seven of the target coverage rate indicators; the two models had different profiles in terms of clinical level outputs</td>
<td>Overall positive</td>
</tr>
<tr>
<td>Barrera-Osorio (2007)</td>
<td>1999–2003</td>
<td>Colombia</td>
<td>Schools</td>
<td>Student dropout rates and student test scores for reading and English</td>
<td>PPP schools had significantly lower dropout rates and better test scores</td>
<td>Positive</td>
</tr>
<tr>
<td>Study</td>
<td>Period</td>
<td>Country</td>
<td>Sector</td>
<td>Performance Category</td>
<td>Findings</td>
<td>Performance Advantage</td>
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<tr>
<td>Cabral et al. (2010, 2013, 2008)</td>
<td>2003–2004; 2001–2006; 2001–2009</td>
<td>Brazil</td>
<td>Prisons</td>
<td>Security and order (prison escapes, assaults, and deaths) and service to inmates (medical care, psychological care, and legal aid)</td>
<td>Privately operated prisons had (significantly) lower escapes, assaults, and deaths, the frequency of services to inmates was higher, and legal efficiency was better</td>
<td>Positive</td>
</tr>
<tr>
<td>Shet et al. (2011)</td>
<td>2007–2009</td>
<td>India</td>
<td>Health Care Clinics</td>
<td>Adherence and treatment success</td>
<td>The public and public-private clinics outperformed the private clinic</td>
<td>Overall positive</td>
</tr>
<tr>
<td>Atmo et al. (2015; 2017)</td>
<td>2004–2011; 2000–2014</td>
<td>Indonesia</td>
<td>Power Plants</td>
<td>Availability of the power plants and carbon emission levels</td>
<td>PPPs had better operational outcomes and significantly better availability performance</td>
<td>Positive</td>
</tr>
<tr>
<td>Hafeez et al. (2016)</td>
<td>2014</td>
<td>Pakistan</td>
<td>Schools</td>
<td>Student test scores for mathematics, English, and average scores</td>
<td>PPP schools had significantly better test scores</td>
<td>Positive</td>
</tr>
<tr>
<td>Yaya (2017)</td>
<td>2000–2012</td>
<td>Scotland</td>
<td>Schools</td>
<td>Satisfaction with the quality of the building and services</td>
<td>Results were mixed but mostly positive, although often not significant (Petersen, 2019)</td>
<td>Overall positive</td>
</tr>
<tr>
<td>Study</td>
<td>Period</td>
<td>Country</td>
<td>Sector</td>
<td>Performance Category</td>
<td>Findings</td>
<td>Performance Advantage</td>
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<tr>
<td>Rodrigues and Zucco</td>
<td>2009–2015</td>
<td>Brazil</td>
<td>Schools</td>
<td>Time spent on pedagogical activities and satisfaction with ten operational services</td>
<td>Principals of PPP schools spent more time on pedagogical activities and were significantly more satisfied with six of ten of the operational services</td>
<td>Overall positive</td>
</tr>
<tr>
<td>Ferreia and Marques</td>
<td>2012–2017</td>
<td>Portugal</td>
<td>Hospitals</td>
<td>Process of care in terms of quality of services (care appropriateness, clinical safety) and access to service delivery (timeliness, service availability)</td>
<td>The public hospitals do not perform better than PPP hospitals; in fact, the differences between public and PPP hospitals are not significant</td>
<td>No</td>
</tr>
</tbody>
</table>
STRUCTURE OF THE VOLUME

Although this is an edited volume, the chapters share a common analytical strategy in assessing the performance advantage of PPPs. The analyses are concentrated on identifying any performance differences between groups of projects, one group representing PPPs and the other representing an alternative, non-PPP mode of procurement. Each chapter focuses on a particular country and infrastructure policy sector to increase the comparability of the PPPs with the benchmark data. Chapters also explore possible explanations and mechanisms for the (non-) existence of a PPP performance advantage. The chapter authors of this book were also invited to contribute to this volume because of their previous and/or recent experiences analyzing PPP performance using a comparative approach and benchmarking it against the performance of traditionally procured projects.

In Chapter 2, Graeme Hodge and Carsten Greve reflect on the challenge of evaluating the performance of PPPs. In their *International Handbook on Public-Private Partnerships*, Hodge (2010) identified six evaluation challenges: defining the evaluand, multiple PPP objectives, multiple discourses and disciplines, the evaluator’s role, evaluation rigor for individual studies, and accurately reviewing multiple individual studies of PPPs. For the current book, they have developed these challenges and grouped them into four dimensions that should concern today’s researchers of PPP performance: evaluation philosophy, performance criteria and measurement, theoretical foundations, and methodology. A range of views on these dimensions is explored and, by reflecting on various examples, the authors illustrate the contested space within which PPP performance evaluation inevitably occurs.

The second chapter is followed by six empirical chapters. The first three of these focus on social infrastructure (schools, hospitals, and sports stadiums) and the latter three focus on economic infrastructure (roads and waterways; for a classification, see Grimsey & Lewis, 2004).

In Chapter 3, Cian O’Shea, Dónal Palcic, and Eoin Reeves compare PPP schools to traditionally procured schools in Ireland, focusing on capital costs, construction costs, operation and management costs, and lifecycle costs, but also on the quality of the assets and services delivered under the PPPs and traditional schools. Using interview data, they go deeper into the different experiences of both public and private managers in running these schools. Chapter 4 by Diogo Cunha Ferreira, Rui Cunha Marques, Maria Isabel Pedro, and Gonçalo Santos compares PPP hospitals to publicly managed hospitals in Portugal. They comparatively analyze the performance differences regarding efficiency, access to health care, care appropriateness, and clinical safety. Chapter 5 takes us across the Atlantic to Brazil. The setting: the 2014 FIFA
World Cup. Claudio José Oliveira dos Reis and Sandro Cabral compare PPP sports stadiums to public and private sports stadiums, focusing inter alia on on-budget delivery, on-time delivery, and the cost per seat. Chapter 6 takes us back to Europe again and to the Netherlands. Based on a recent evaluation study of the performance of DBFM compared to D&C using different sources of data, Ingmar van Meerkerk, Mike Duijn, Rianne Warsen, Stefan Verweij, Erik-Hans Klijn, Joop Koppenjan, and Samantha Metselaar compare and reflect on the cost and time performance of roads and waterways transport infrastructure projects. In Chapter 7, we stick to road transport infrastructure projects and look into the cost, time, and quality performance of projects in India, analyzed by Akash Deep, Mojahedul Islam Nayyer, and Thillai Rajan A. Finally, in Chapter 8, continuing the theme of road transport infrastructure, Daniel Albalate, Germà Bel, and Paula Bel-Piñana use panel data to compare the safety performance of PPP motorways to those of publicly managed motorways in Spain.

Finally, in Chapter 9, we take stock. First, we integrate the literature discussed above with the results from the empirical chapters to answer the main question that drives this book: Does the performance advantage of PPPs exist or not? We also discuss and reflect on the different reasons and mechanisms that explain any performance advantages that exist. Based on this, we develop recommendations for PPP practitioners and propose an agenda for future research.

NOTES

1. The definition of performance also depends on the theoretical or evaluative frameworks used and on the disciplinary perspective assumed (Hodge & Greve, 2017, 2019; Jeffares et al., 2013).

2. The World Bank (2014, 2017), for instance, also identifies that infrastructure is often inadequate due to inefficient and ineffective delivery of the infrastructure, poor planning and project selection, and insufficient public funds; they also indicate that PPPs may alleviate these problems through the transfer of planning and management tasks to the private sector and through private sector funding and financing.

REFERENCES


Assessing the performance advantage of public-private partnerships


