# Preface

Infrastructure systems are vital in providing the necessary conditions to foster growth and economic development and in increasing the livable conditions of populations. The way countries have chosen to develop their infrastructure systems is not consistent across the globe. There has been a trend toward increasing private sector participation in public service provision. Among the several models for integrating the private sector, public-private partnership (PPP) arrangements are gaining momentum.

Infrastructure systems are essential to economic development but require large availability of capital and specific know-how. For these reasons, governments are engaging in PPP projects all over the world. On the one hand, the private sector is looking for investment opportunities, particularly with low levels of risk, and on the other hand, governments need to develop new infrastructure systems and/or refurbish existing ones.

This book will address several issues. How can the robustness of the decision making process leading to the option of PPP be improved? How should the contracts be designed to enable them to address the uncertainty of infrastructure in PPP projects? How should PPP contracts be managed? How should the inevitable renegotiations be addressed? The main objective is to provide insight into current PPP practices but also to develop mechanisms to improve the decision making process as well as the performance of the PPP contracts, particularly in the medium and long terms.

It is possible to disaggregate the main objective into several smaller objectives, as follows:

- Analyze the current models to calculate the public sector comparator (PSC) and propose new methods to compute it;
- Improve the process of decision making leading to the choice of a PPP option;
- Improve contract design to accommodate uncertainty and improve risk management through the development of flexible contracts;
- Design the management contract principles and procedures so that the contract can be effective, helpful, and useful and allow the objectives of both partners to be achieved with the PPP project;

- Understand the main determinants behind the renegotiation of concession contracts;
- Develop guidelines to decrease the probability of renegotiation and minimize the harmful effects on social welfare.

This book is organized into six chapters around these key objectives. After the introduction, where the main features of the PPP model are presented and discussed, the second chapter concerns the decision making process leading to the choice of the PPP option, with a particular emphasis on the PSC. Once governments (central and local) engage in PPP arrangements, they face a second challenge – contract design. Thus, the third chapter will look into contract design from a new perspective – developing flexible contracts to cope with uncertainty. Most academic and empirical works have been focused on the phase of contract design, but little attention has been paid to the longest phase: contract management (the fourth chapter). These contracts are in force for 20, 30, or 40 years and are thus subjected to great uncertainty. Contract management becomes a critical issue. Academic literature and empirical data show that most contracts are renegotiated a few years after the initial agreement is reached. Thus, renegotiations become a critical issue for the success of the PPP model. This is the core of the fifth chapter. Finally, the conclusion presents a summary of the main contributions of this book as well as its policy implications. It also presents some directions to take for future developments in these fields.

Here is a brief synopsis of each of the chapters.

## Chapter 1: Introduction to PPPs

Chapter 1 will be the introductory text of the book. It will contain some general information regarding PPP arrangements, namely, the definition, types of PPP projects, and models for private involvement in infrastructure provision. It will also discuss the economics of PPP as well as tools for choosing the best alternative, the risk issues and the world trend of PPPs. It is an introduction to the chapters that contain the main contributions of the book.

## Chapter 2: Public Sector Comparator Calculation

This chapter will look into the definitions of the PSC and value for money (VfM) tests and provide an overview on when and how the PSC is used and calculated. The methodology followed will consist of the use of an international benchmark to analyze the main advantages and disadvantages of the several calculation methods adopted by governmental agencies, with a particular emphasis on the discount rate. This will provide a unique set of information for those working on the PSC, both academics and practitioners. This chapter will also present and discuss some real case studies.

To the authors' knowledge, no other work has presented such detailed information on real PSC calculations and methodologies. Later, the research results will be used to identify and analyze the critical steps when performing a PSC calculation. Each of these tasks will be critically discussed, and their main existing alternatives will be presented while identifying the main benefits and pitfalls.

The research presents innovative contributions in two different areas: first, by shifting the calculation of the PSC from deterministic to probabilistic, and second, by developing a new model for calculating probabilities – Bayesian networks (BN). The shift from a deterministic calculation to a probabilistic calculation explicitly accounts for the uncertainty of the calculation. Most forecasts and cost estimations are flawed. Nevertheless, most practitioners and decision-makers base their decisions on a single number, although they are aware of the uncertainty surrounding the calculation. Two different models were used, Monte Carlo and BN, and while the first is relatively well studied and often used in cost estimation and forecast problems, to the authors' knowledge, the second has not been applied in this field until now.

## Chapter 3: Improving Contract Performance: Contractual Flexibility

The literature on PPP contracts has often presented long term rigid contracts as the answer to uncertainty. In some way, the fact that a PPP project can be seen as a relationship-specific investment subject to bargaining and opportunistic behavior might justify the need for this type of contract, which intends to provide a more stable and predictable future. Nevertheless, this has also been observed for risk sharing between two agents but not so much for the value maximization of the project.

This chapter will focus on improving contract performance in uncertain environments. If uncertainty is taken as an assumption rather than as a fact, it could be used as an opportunity. However, this requires managerial flexibility. Risks will be identified, and flexible options will be created, always under the principle of developing solutions with practical application.

Increasing attention is being paid to measures aimed at reducing risk exposure, but most studies on this issue have been related to the financing aspects. This work will go a step further, first by identifying the possibilities for introducing flexibilities into a PPP contract, and second, by quantifying, through a case study, the economic gains of such a contractual design model.

This chapter will provide an overview on the main sources of risk and uncertainty in PPP projects, present the main types of flexibilities used in PPP arrangements based on a literature review, and present a new framework for flexibility classification. This section will also revisit the main methodologies for flexibility valuation, and finally, a case study (healthcare PPP project) will be developed to analyze and economically evaluate the effects of developing flexible contracts. The last section provides the main conclusions of the research.

## Chapter 4: Contract Management. How Important Is It?

The main objective of this chapter is to improve the current practices of contract management to comply with the aims of the contract, including decreasing the risk and the effects of renegotiation. To achieve this purpose, several tasks will be performed: (1) using an international benchmark of current management systems to identify the main benefits and pitfalls; (2) developing a dynamic model for the active management of contract performance based on the three dimensions of contract management, which are operational management, administrative management, and relationship management; and (3) presenting and discussing the best practices of the internal aspects and key activities of contract management.

This chapter is also intended to contribute to the clarification of the role of several stakeholders involved in contract management, particularly the "contract manager" and the regulator. The improvement of current management systems will have to take into account the issue of renegotiations because the management of this process is one of the most critical aspects for the success of the concession model.

## Chapter 5: The Problem of Renegotiation. What Are the Determinants? How Should a Renegotiation Be Managed?

This chapter aims to provide answers to the following questions: How and why do renegotiations happen? What are the main determinants? How can the risk of renegotiation be avoided or controlled? To allow for a deeper and structured analysis, the main determinants for renegotiations are categorized into two groups: exogenous and endogenous variables. Exogenous variables refer to the project's characteristics (dimension, complexity, sector, etc.), while endogenous variables refer to the contractual clauses, for example, the existence of a clause ensuring a determined (shareholder or project) internal rate of return (IRR), limiting the value at risk (VaR). This chapter is organized as follows: after a brief introduction, the literature on renegotiations will be reviewed; next, the exogenous determinants of renegotiations will be discussed, identifying the main determinants through an econometric model, followed by the text on the endogenous determinants of renegotiations; the main causes, results, and costs of renegotiations will also be examined; the "economic and financial re-equilibrium" (EFR) model will be presented as an alternative to tackle uncertainty; finally, the last section will present the main findings and policy implications.

## Chapter 6: Conclusions

The final chapter will present the main findings of the analyses developed as well as several further developments in each of the following focus areas: PSC, flexible contracts, contract management and renegotiations. In addition to the contributions described, several paths that we believe are promising research areas for those researching PPP contracts are presented. Additionally, some policy implications are developed over several areas for those working with PPP projects in a real context.

Springer

http://www.springer.com/978-3-642-36909-4

Infrastructure Public-Private Partnerships
Decision, Management and Development
Oliveira Cruz, C.; Marques, R.C.
2013, XX, 171 p., Hardcover
ISBN: 978-3-642-36909-4