



## PPP Comparative Study based on Type, Terminology, and Model Adaptation

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Public-private partnerships (PPPs) have emerged as a crucial mechanism for infrastructure development, particularly in nations facing fiscal constraints and technical limitations. This study conducts a comparative analysis of PPP projects globally, focusing on three critical aspects: types of models, adaptability of models, and the terminology used. Various countries define and implement PPP differently, influenced by their legal frameworks, economic conditions, and project-specific needs. The study aims to identify the different characteristics of the PPP model, the highly adaptive model, and the various terminologies used for PPP. The research identifies a formula for determining PPP models based on asset involvement, partner participation, and payment mechanisms. Findings reveal that greater private sector involvement correlates with higher PPP adaptability models, such as Build-Operate-Transfer (BOT) and Design-Build-Finance-Operate-Maintain (DBFOM) are among the most widely adopted. Additionally, the study highlights the inconsistencies in PPP terminology across different jurisdictions, underscoring the need for a globally unified framework to enhance efficiency and cross-border collaboration, reinforcing the necessity for standardized policies to streamline global PPP implementation.

**Keywords:** Public-Private Partnership Project (PPP), Comparative Study, Types of PPP Model, PPP Terminology, PPP Model Adoption

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## 1. Introduction

Public-private partnership projects are contractual collaborations between private investment and government agencies to foster a nation's development. PPP has been significantly adopted by many countries. International organizations such as the World Bank are in favor of spreading the adoption of PPP, offering financial and technical support to maintain global equilibrium. The PPP models are mostly used in new infrastructure development or maintaining existing ones, as these are long-term contracts lasting up to 30 years or even longer (Ke et al., 2010). PPP lies under the Sustainable Development Goal number 17 (Partnership for the Goals) by involving the private sector in sustainable infrastructure development (UNCTAD, n.d.), (India, n.d.), (UNECE, n.d.). A country that has scarce resources is not able financially and technically to achieve the required development on a large scale in a short time, therefore, PPP is the partnership between a private entity/investor and government that facilitates a new way to achieve the goal of infrastructural development, also worldwide, countries are facing fiscal budget deficit which makes it challenging to a certain significant portion of the budget for infrastructure development which in return reduce the annual growth of development through implementation of this novel way it can help in reducing the budget burden on government by the financial and technical supports of private investors or entities, PPP model prove its efficiency over traditional procurement model (Sagalyn, 2011).

PPP slogans are often used interchangeably in different parts of the world as they could challenge international application (Mouraviev & Kakabadse, 2012). In the last two decades, PPP has become a widely researched area for authors who have pitched multifaceted fields and topics in PPP; however, there is still no significant work done on the comparative study of PPP projects across the globe. Through comparative analysis, we would be able to identify similarities and differences that help upsurge PPP efficacy and global adoption in a meaningful way (Pickvance, 2001).

This study aims to identify the characteristics that form a PPP model, recognition of highly adoptive models, and the widespread use of PPP terminologies worldwide.

This study will help in the understanding and differentiating PPP from other models, as well as the types, terminology used over the decades in different countries, and the scale for PPP model adoption. The study can help in finding answers to the question, which models are used mostly and resolve the infrastructure development needs of a nation.

## 2. Methodology

This paper adopted a comparative analysis to explore the similarities and differences based on the type and terminology used for PPP, and also to discover an extensively adaptive PPP model. Our comparative study includes at least one country from a developing economy and one from a developed one to achieve a superior result. PPP is a well-known universal phenomenon and an emerging trend in project finance. Therefore, it is crucial to understand the different types and terminologies practiced by various countries, and models that are highly adapted; hence, we implemented a comparative study to understand and explore the implications of various causal PPP models.

## 3. PPP Premier

The PPP movement has become increasingly professional, broader, technical, and rational in recent decades. Indeed, its historic origin has provided thorough new policy and method solutions to the provision of public infrastructure. To solve the population problem around the world most countries have increasingly attempted to implement large-scale infrastructural projects and this has become a challenge for most countries leading to budget shortages and technical bottlenecks Besides giving comfort in the fiscal budget, it also utilizes the efficiency and technical ability of the private sector and improves privatization but not losing the ownership of assets (Solheim-Kile et al., 2019).

## 4. Literature

Types and Models of PPP: Over the years, PPP has grown a lot and introduced different models, each as follows, despite PPP models or types being defined differently by countries and authors. India's PPP practice guide classified PPP contracts under three main categories (Department of Economic Affairs, 2016).

1st: Management Contracts

2nd: Lease Contracts

3rd: Build-Operate-Transfer Contracts

Management contracts, these contracts are short terms (3 - 5 years) the ownership of the contract remains with the public authority some rehabilitation and management work and responsibilities are transferred to the private party for a short period, Such as; management for fee contracts, management contracts with incentives (Cost and Quality), and management and finance contract.

In lease Contracts, the asset is transferred by a public authority as a lease to the private party, usually for medium-period contracts. The investment burden might be on the private partner. Models include: Build Lease and Transfer (BLT), Build Operate Lease and Transfer (BOLT), and Build Transfer and Lease (BTL). In the lease agreement, the private partner does not receive a service fee from a public authority; instead, it charges a user fee to customers and pays a portion to the public authority for being the asset owner.

Build-operate and transfer contracts are a pivotal PPP model used to finance large Greenfield projects in which the risk of finance, operation, and price risk is transferred to the private partner. Usually, the BOT model is used to finance large-scale infrastructure projects. Model variants include: Build Operate and Transfer (BOT), Design Build Operate (DBO), Design Build Finance Operate Transfer (DBFOT), Build Own Operate Transfer (BOOT), Design Build Own Operate Transfer (DBOOT), and Build Operate Own (BOO).

According to the World Bank definition, PPP contract types are generally categorized by three criteria: first, asset involvement; second, private party involvement; and third, payment mechanism to the private party. There are three criteria under which PPP contract types or models can be classified (Delmon, 2021).

1. Asset involvement, many PPP projects involve new assets also called Greenfield projects, where the private party is responsible for financing, designing, building, and operating a new asset, the asset involved in PPP might also be an existent one also called a brownfield project which the private party is responsible for expansion or managing of an asset.

The key feature of a PPP project is defining assets or models by project output rather than input.

2. Private party involvement, it's difficult to identify the functions of private partners because they vary from asset to asset; the following are the functions.

a) Design includes preparing and developing a complete package that defines the end project's design, specifications, and requirements.

b) Build or rehabilitation, most PPP infrastructure projects require a private partner to build and complete a new infrastructure project and install all the equipment. A PPP project may also be involved in an existing project in which the private party is responsible for the expansion and rehabilitation of an asset.

c) Financing, whether rehabilitation or building, a private party may be wholly or partially responsible for financing the assets.

d) Maintaining this function may be fundamental for a contract-responsible private party to maintain assets for a specific contract period.

e) Operating, this function relies on the nature of an asset; the private party could be responsible for providing supporting services or technical operations.

A specific firm called a Special Purpose Vehicle (SPV) is usually established by a private party to efficiently perform the above functions.

3. Payment Mechanism refers to the payment mode made to the private partner for the service provided. The payment may be received by charging a service fee to the users (user fee) or payment from the government (government pays). The payment mode may be combined in different ways to ensure the private party receives a financial reward/return.

For reference and more details, refer to the World Bank's nomenclature Table 1, modified and adopted by the author for the study.

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Models	Nomenclature	Short Description	Nature of Asset (New or Existing Infrastructure)	Functions Transferred to the Private Sector	Payment Source
Design and Build Model	Design-Build-Finance-Operate-Maintain (DBFOM); Design-Build-Finance-Operate (DBFO); Design-Construct-Manage-Finance (DCMF)	Under this PPP agreement, a contract can be described by the responsibilities and functions transferred to the Private partner.  A model without a maintenance function DBFO and an alternative with a similar description to a model without implies the build operation is DCMF, equivalent to a DBFOM contract.	New Asset	As indicated in the model nomenclature. Design, construct, build, finance, and maintain.  Typically, this implies some or all operations in a model by definition.	Possibly paid by either the government or User pay
BOT Model	Build-Operate-Transfer (BOT). Build-Own-Operate-Transfer (BOOT). Build-Transfer-Operate (BTO)	This model is well known among all others, specified by the asset ownership. Under a BOT model, the private party owns the project's assets until the end of the contract and is eventually transferred to the government. The term BOOT is often used similarly to BOT, as described.  (Delmon, 2021a) describes how the ownership transfers at the end of the agreement.	New Asset	Main functions are; Build, Operate, and Own.  BOT and BTO may not include private finance, whereas BOOT always includes private finance.	Either by the Government or User pay
Rehabilitation Model	Rehabilitate-Operate-Transfer (ROT)	Similar to BOT, when rehabilitating takes the place of build, the private party is responsible for the function of Rehabilitating, extending, or upgrading the existing asset instead of building a new one.	Existing Asset	Rehabilitate, Operate, and Transfer.	Either by the Government or User pay
Concession Model	Concession	In some jurisdictions, the concession is used for a specific type of agreement, while in others, the term is used more widely. As described in (Delmon, 2010), Box 1 on page 9.  In some countries, the PPP model, paid by User pay, is called a concession.  For example, in Brazil, user pay projects are special deals under the concession law. However, government-pay projects are regulated under a separate PPP law.  On the other hand, sometimes concession is used in a wide range of PPP models, for example, all recent PPPs in Chile have been implemented under the Concession Law, including fully government-paid contracts.	New or existing Asset	Rehabilitate, design, build, finance, extend, maintain, and operate, including providing services.	Depending on the financial viability of the project.  Usually, a user pays in some countries. The private party might pay a fee to the government or might receive a subsidy.
PFI Model	Private Finance Initiative (PFI)	The United Kingdom was the first country to introduce the Private Finance Initiative, or PFI, under PPP. Especially to finance, build, and manage new infrastructure.	New Asset	Includes; Finance, Design, Build, and Maintain.  It may include some operations; however, it doesn't provide service to direct users.	Government pays
O&M Model	Operations and Maintenance (O&M)	Operating and maintenance contracts are used for the existing asset, especially involving large investments by private parties, also called performance-based agreements.	Existing Asset	As prescribed by Name	Government pays

Management and Service Model	Affermage	The Affirmage contract is described as the same as the O&M model, but the only difference is that the private party isn't responsible for financing. Affermage may not fall under the PPP models in some jurisdictions. TheWorld Bank's explanatory notes on water regulation (36–42)describe in some cases that affermage may or may not fall in PPP models.	Existing Asset	Operation and Maintenance	User user-pay private party may receive a portion of the user payment as per the agreement to recover its initial cost.
	Management Contract	Typically, it is a mid-term contract, usually three to five years. The ownership of the asset control remains with the government, and the private party is responsible for the maintenance and operation.	Existing Asset		The private party receives a Management fee as revenue.
Franchise Model	Franchise	This term is used interchangeably sometimes for Affermage, Lease, or Concession Models. Described by (Yescombe, 2007).	Existing or New Asset	Includes; Finance, design, build, and operating and maintenance are limited to operating.	Either by the Government or User pay

**Table 1:** The table represents PPP Model nomenclatures adopted and modified by the author/ Source: ("PPPLRC," 2022).

PPP Models Adaptability: The degree of private party involvement in a PPP project determines the level of adaptability of that model; the higher private partner involvement attracts investors to a public partnership. The degree of private involvement in various models is shown in Figure 1. PPP is an internationally adopted solution for infrastructure development; however, various countries adopt models depending on their needs and practices, as shown in Table 2. In the US, the design, build, finance, operate, and maintenance (DBFOM) model is adapted, and a key solution for the transportation infrastructure financing (Martin et al., 2013). India is geographically a widespread country according to the statistics India is 7th largest in terms of geography approximately 3.29 million square kilometers (Wikipedia, n.d.) which requires an immense amount of road construction for the economic and local transport connectivity, the government has overcome this problem by introducing PPP's Build, operate, and transfer (BOT) model (Teja & Rahul, 2017). The types of PPP projects mostly adopted in Vietnam are Greenfield projects, which means that they are constructed newly, e.g., BOT (ADB and AFD, 2012).

No	PPP Model	Country
1	Design, build, finance, operate, and maintain (DBFOM)	USA
2	Build, operate, and transfer (BOT)	India
3	Greenfield project	Vietnam

**Table 2:** PPP models have been adapted across various countries.

Terminology: though PPP was recognized decades ago as an internationally adopted model for development projects, it still lacks a specific definition globally; the term is used differently in various countries. The term PPP is a contractual agreement between private and public authorities, regardless of the terminology used for it in different countries. We have explored here how PPP is understood by various countries (Table 3).

No	Country	Terminology
1	Brazilian	Government-pays project/contract
2	France	Government pays project
3	UK	Private Finance Initiatives (PFI) Private Finance 2 (PF2)
4	Chile	Concession

**Table 3:** The terminology used for PPP varies in different countries. Source: (World Bank, n.d.).

The Brazilian government has two different law mechanisms for distinguishing PPP from other contracts. Projects under government-pays are regulated by the PPP law, while user-pay contracts are regulated by the concession law.

In France, projects paid for by the government (government pay) and regulated under PPP law are termed PPPs, and projects paid for by users (user pay) are called concessions.

The United Kingdom first introduced and practiced PPP contracts initially known as private finance initiatives (PFI), for the construction of new assets under government pay, known as PFI, where already existing assets under government pay are called franchises, subsequently, known as PF2, with the introduction of some updates and improvements in policy.

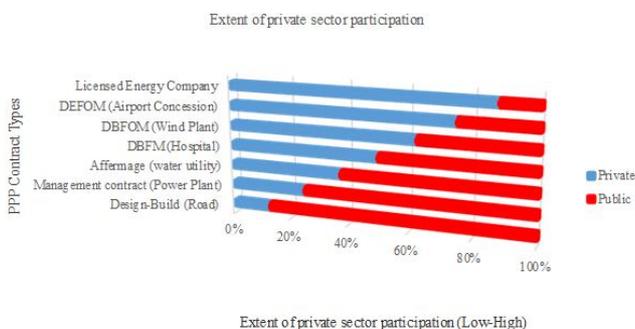
In Chile, all PPP projects are known as concessions and governed under the concession law.

### 5. Result

We can establish from this study that a type of PPP model can be formed based on three criteria, such as private involvement, mechanism of payment, and type of asset. These characteristics could be combined according to the need and nature of a project to form a type of contract. We suggest the following formula to understand and construct a PPP model, which helps in defining and forming various types of models: "Asset involved (Build, Operate or Maintain) + Partners (Private, Public) + Payment source (Government-Pay, User-Pay) = A PPP Model".

The main characteristic among PPP models is private involvement, and the extent of private investor involvement determines the scale of PPP model adaptation. The high degree of private involvement in such projects determines an extensively adopted model and is highly practical (Figure 1).

**Figure 1:** The degree of private involvement in various projects/ Source: World Bank



Initially, the PPP practice was introduced by the United Kingdom, first known in the form of a private finance initiative or PFI.

Later on, this practice was adopted by many countries and gradually attracted global attention. The current terminology, public-private partnership or PPP, was introduced by the World Bank with much support and a practical solution to increase the synergy globally. Still, many countries around the world practice PPP according to their understanding and regulations (Table 3).

### 6. Conclusion

PPP practice is an internationally adopted model in development projects; a uniform structure, terminology, and policy can improve its efficacy. This research presents a comparative study based on three critical factors; Types, terminologies, and model adaption that are practiced and defined differently in various countries, PPP models are formulated based on the needs of a specific project or jurisdiction, we can conclude from this research a formula through which different types of PPP model could be identified and formulated; "Asset involved (Build, Operate, Maintain) + Partners (Private, Public) + Payment source (Government-Pay, User-Pay) = PPP Model". Our research indicates that, despite PPP being a global practice, countries still define PPP according to their understanding. From the conclusion of this research, it appears that a high degree of private involvement determines the adoption level of the PPP model, and we can also conclude that the construction and building of new assets/projects are extensively implemented projects rather than the existing assets/projects, and models such as BOT and DBFOM are extremely versatile. However, there is still the absence of a unified and specific definition for PPP around the globe; therefore, we suggest that policymakers worldwide should work for an internationally unified practice that helps practitioners and investors remove the barriers and increase the global practice and efficiency of PPP.

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