

Factors Contributing to the Success of Public-Private Partnership Projects in South Asian Countries: An Econometric Study

Mohammad Taslim Uddin, Ph.D *

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Abstract

This study examines the factors that contribute to the success of Public Private Partnership (PPP) projects in the South Asian region with an emphasis on project and contract attributes. The paper uses a panel data set on success and failure of the PPPs in five South Asian countries that reached financial closure between 1993 and 2016. For the regression analysis it uses logistic regression since the outcome variable is binary in nature. The findings indicate that projects in the information and communication technology sector and transport sector are more prone to failure compared to those in the energy sector. Additionally, a larger share of risks and responsibilities assumed by the private sector positively affects project outcomes. Price instability, as expected, lowers the likelihood of success, whereas development assistances improve it. Furthermore, local governments are found to be more efficient than their national counterparts, and smaller projects tend to achieve higher success rates than larger ones. Finally, the findings show that effective balancing of investment freedom and quality regulation is instrumental to PPP success.

Key Words: Public-private partnership, infrastructure, project attributes, success and failure, logit, South Asia

JEL Classification: O1, O2, P2, P3.



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* Professor, Department of Economics, University of Chittagong.

1. Introduction

Diverse organisations and individuals generally concur that investing in infrastructure is nonetheless essential to boosting capital accumulation, quickening economic growth, and achieving sustainable development. Various groups and individuals generally believe that infrastructure investment is still essential for boosting capital accumulation, accelerating economic growth, and achieving sustainable development. Many different groups and individuals agree that investing in infrastructure is always essential to boosting capital accumulation, accelerating economic growth, and achieving sustainable development.

There is general consensus among diverse groups and individuals that investing in infrastructure is crucial for enhancing capital accumulation, speeding up economic growth, and attaining sustainable development. Table 1 and Figure 1 show that the South Asia region (SAR) has far more infrastructure gaps than any other developing region. As a result, the region urgently needs to improve both the quantity and quality of its infrastructure. However, the SAR is not an exception to the global economic stresses that continue to impair nations' and financial markets' capacity to finance. In light of this, government agencies are still exploring alternative funding opportunities for the development and successful completion of government infrastructure projects. They see public-private partnerships (PPPs) as a convenient choice for acquiring public goods and services, despite community sentiment being strongly in favor of universal public provision for such services (Hall, 2015).

Table 1: Infrastructure Investment Shortfall from 2014 to 2020 (annual, in billion US\$)

	EAP	SA	LAC	SSA	ECA	MENA	Total
Required amount	87	309	141	58	62	53	711
Available amount	35	68	41	28	35	52	259
Gap	52	241	100	30	27	1	452

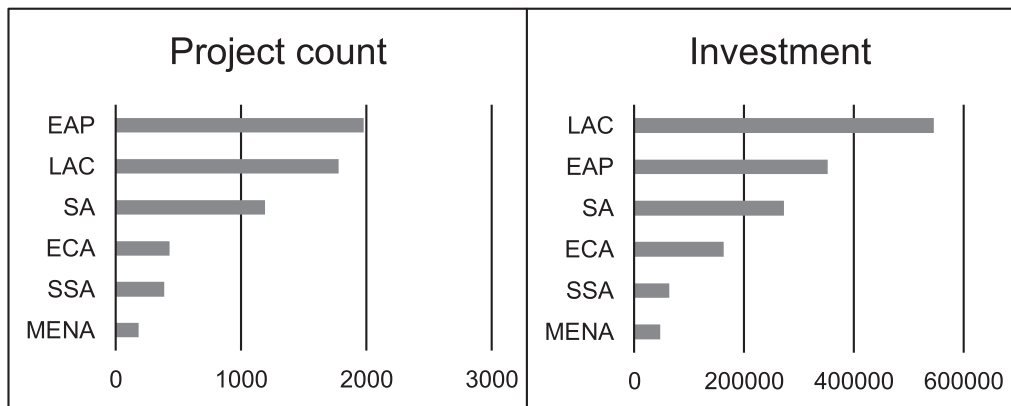
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Source: Ruiz Nunez and Wei (2015)

Note: EAP = East Asia and the Pacific, SA = South Asia, LAC = Latin America and the Caribbean, SSA = Sub-Saharan Africa, ECA = Europe and Central Asia, MENA = Middle East and North Africa

In essence, a PPP is a contract between the public and private sectors where the private sector constructs and runs a portion of a public service or asset. In accordance with this agreement, the private sector takes on significant risk (including financial risk) and responsibility in return for compensation based on performance over a specified duration, which can consist of user fees, government payments, or a combination of both. Alongside acquiring funds from the private sector and shifting risk to it, PPPs are claimed to provide enhanced and performance-driven delivery of public infrastructure and services (Regan, Smith, and Love, 2014).

Figure 1: Regional ranking by project count and investment (total), 1994-H12018



Source: World Bank's Private Participation in Infrastructure Project database.

Based on the idea that bringing private management and money to public infrastructure assets and services may increase efficiency, remove financial limitations on infrastructure investment, and expand fiscal space, PPPs are growing in popularity globally. Proponents argue that an effective PPP arrangement can: lower government spending and raise revenue, which will have a net positive fiscal impact; and boost competitiveness, prompting the

private sector to invest in utilities, transportation, health care, and education to foster economic growth and development (Lammam et al., 2013 & Van Herpen, 2002).

One specific worry, however, is that PPPs could primarily be employed to circumvent spending limits, shift public investment off the official budget, and debt away from the government's balance sheet—all while the government retains most of the risk and could face substantial fiscal expenses (IMF, 2004). PPPs, according to its opponents, are essentially a covert kind of public borrowing that gives private companies long-term state assurances for profits. Sometimes, PPPs can bring resources from the private sector to an area that needs more funding or may be facing a negative fiscal balance. They are not the solution for every infrastructure development issue, though, and the data indicates that they might even make matters worse, which could result in project failure (Hall, 2015).

The decades-long evidence of distressed and rejected PPP projects worldwide suggests that PPP proponents may be making false promises due to profit-maximizing behavior in the private sector and political incentives in the public sector (ibid). PPPs generally show a varied track record across different sectors; some have thrived, whereas others have encountered difficulties that led governments to buy back their assets at substantial losses to avoid market collapse (Chua and Loh, 2012). As a result, worries that citizens might not have gotten the most out of their tax dollars through PPPs are growing along with the global trend toward PPPs.

The study seeks to explore how project characteristics (such as the industry sector of a project) and the contract's nature (including levels of private involvement in an infrastructure project, the number of sponsors, and multilateral support) affect the successful completion of PPP projects in SA countries. Specifically, are there certain elements that influence whether PPPs in South Asian nations and abroad succeed or fail? However, it is outside the purview of this study to evaluate PPP project success or failure in a larger context that involves determining public benefits. This study exclusively centers on the first step that determines success or failure—whether a project is completed successfully, operational, facing issues, or ultimately canceled.

A contract between public and private sectors regarding the implementation of PPPs and their possible results — whether successful or not — relies on the existing enabling conditions, which can be characterized by various factors unique to the nation (like economic risks, country characteristics, etc.), to the projects themselves (like contractual agreements), and to the agreement itself. PPP projects frequently achieve financial closure, and stakeholders execute the risk allocation agreement with the anticipation that the pre-arranged risk distribution will be satisfactory. Nevertheless, even while ex-ante risk allocation drives investments, ex-post risk realization is always what determines whether a project succeeds or fails (Reside, 2009). This study examines hazards after the fact; it looks into PPP outcomes and the factors that influence them. It specifically examines “why PPPs occasionally fail” and seeks to identify the lessons learned from SAR's experiences with PPPs.

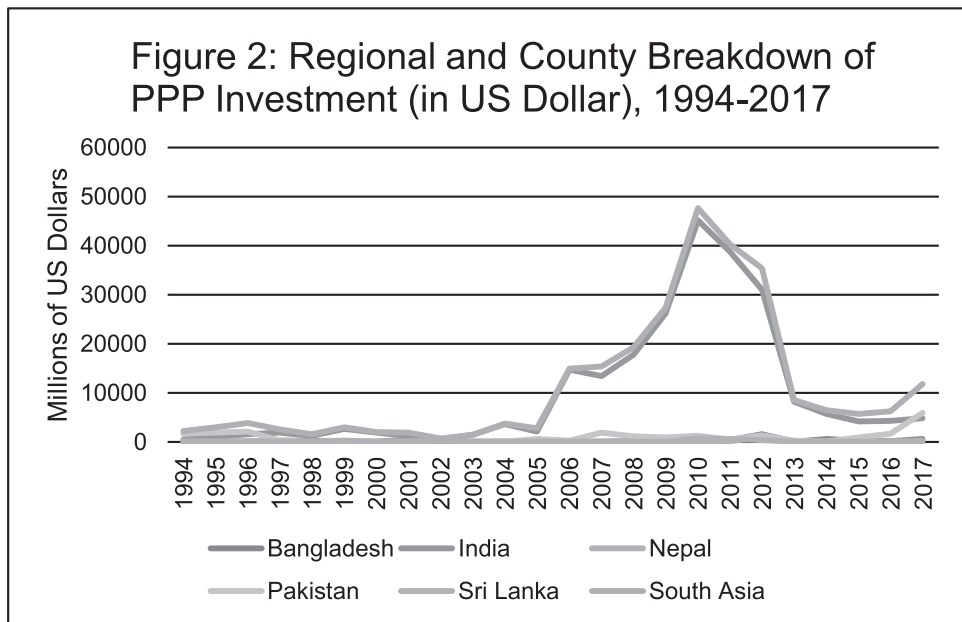
The paper is structured as follows. Section 2 offers a summary of PPPs in South Asia, while section 3 provides review of literature. Section 4 outlines the study's goal, and Section 5 explains the methodology, which includes the econometric model, data and variables, theoretical background, and hypothesis development. Section 6 presents and discusses the empirical findings, and section 7 concludes the paper.

2. Overview of PPPs in South Asia

PPPs in the SAR initiated in India in 1988 with the establishment of Gujarat Gas Company Limited, a greenfield venture—a completely new facility that has not been altered or improved—executed in the Build-Own-Operate (BOO) model. Other nations, apart from India, started adopting PPP programs during the 1990s.

Figure 2 displays the amount of country-level PPP investments in the SAR spanning from 1994 to 2017. With some exceptions, such as two declines after the 1997 Asian financial crisis and the subsequent crises in Russia (1998), Brazil (1998), and Argentina (2001), PPP investment in this area was very minimal and remained relatively stable before 2005. PPP investments in this area have unexpectedly risen since that time, reaching their highest point in 2010, even with the global financial crisis of 2007–2008 and the European debt

crisis of 2008–2009. This increase was primarily propelled by India. But after 2015, when oil shocks struck the world economy as a whole, they started to slowly recover once more. After that, they may have fallen precipitously as the effects of the crisis became more apparent.



Source: World Bank's PPI database

Table 2 presents the division of PPP projects into sectors and sub-sectors in the SAR from 1994 to 2017, highlighting the comparative development and demand for particular infrastructure types in this area. More than fifty percent of the PPP initiatives in the area are in the energy field, which is a wide-ranging sector that highlights the increased demand for energy resources to facilitate development. It is divided into two major yet different industries: the electricity sector and the oil and gas industry. The absence of PPP initiatives in the oil industry, however, could be attributed to the reality that no SAR countries extract oil.

With the second-largest proportion, the transportation sector indicates the region's prosperity and, consequently, the rising demand for convenient

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market accessibility and the delivery of products and services. The transportation sector is followed by the "water and sewerage" sector, which accounts for just 1.64% of all PPP projects. This suggests that the private sector is not interested in enhancing and modernizing less profitable services, even if they directly improve the social well-being of the populace. It might be due to the well-established ICT private sector in this region that PPPs in the ICT field lag behind other sectors, accounting for merely 1.38% of the overall total. Approximately 97% of all PPP initiatives in SAR pertain to energy (mainly electricity) and transportation. This suggests that industries with more cross-border applications and impact, like transportation infrastructure and electricity, typically draw larger PPP investments than industries with more local applications, like water and sewerage.

Table 2: Breakdown of PPP projects by sector and sub-sector in SAR, 1994 - 2017

Primary Sector	Sub-sector	Number of Projects	Proportion of Regional Total
Energy	Electricity	622	53.57
	Natural Gas	3	0.26
ICT	ICT	16	1.38
Transport	Roads	426	36.69
	Ports	53	4.57
	Railways	11	0.95
	Airports	11	0.95
Water and sewerage	Treatment plant	8	0.69
	Water Utility	11	0.95

Source: Author's calculation using PPI database.

The two sub-sectors of water and sewage are each less improved than the ICT sector. Water projects tend to be more prone to failure because they are generally more localized and less attuned to market pricing. These factors contributed to the failure of numerous early water and wastewater treatment initiatives in China (Reside and Mendoza, 2010). The fact that water utilities

and treatment plants are mostly public in character and have a high failure rate may be the reason for the general reluctance of the private sector to become involved. Risk of failure can arise from a variety of sources. Private companies are rent-seekers by nature, and their presence in public projects immediately raises tariffs; efficiency improvements, if any, occur later. Additionally, the pervasive free-rider issue embedded in public goods leads to the problem of demand estimation. Furthermore, having observed disputes and public resistance to water privatization in various communities globally (along with regular inadequacies in enhancing service quality and accessibility), like in Buenos Aires, Argentina, Cochachamba, Bolivia, and in the Philippines (Reside, 2009), private investors may be reluctant to invest in this sector.

3. A Survey of Literature

A significant portion of the debate on PPP outcomes has emerged through the lens of those who either favor or oppose this method of delivering public infrastructure assets. However, in order for PPP models to effectively provide public infrastructures, a few crucial requirements need to be fulfilled (Murphy, 2008). According to Tam (1999), the success of a project is affected by a various factors, such as an experienced, fair, and transparent governing authority; a sincere and non-corrupt political regime; flawless contractual agreements; and a well-organized legal framework pertaining to Build-Own-Transfer; a large and trustworthy consortium; experienced companies; and, crucially, no political meddling. Project failure is primarily due to ‘an unrealistic initial timeframe — meaning a timeframe that forces reform measures into a WB project cycle, rather than acknowledging the complexity and political aspect of such processes’ and ‘a project design that is overly complex’ (Independent Evaluation Group [IEG], 2015: xxii). Other significant elements that lead to project failure include inflexibility in land leasing prices, changes in construction plans, price fluctuations, inadequate contract planning, financial problems, political risk (Yang et al., 2010), protracted contract award procedures, delays resulting from land acquisition, regional political concerns, changes in scope, as well as holdups in loan approval and disbursement (Ahsan and Gunawan, 2010). The socio-political context, weather, project scale, and

design complexity have all been recognised as crucial elements that could affect the success or failure of a project (Akinci and Fischer, 1998).

A PPP project is deemed successful when it achieves its goals and fulfills public needs (Minnie, 2011). The key elements of a successful PPP project include delivering value for money, which entails an effective risk transfer, appropriate project selection, a thorough understanding of the public sector, and well-defined lines of accountability and redress (Murphy 2008). Political, financial, and market risks represent the crucial risk factors for a project that must be considered (Agrawal, 2010). The most significant factors, identified by Ameyaw and Chan (2015), are to be government commitment and sufficient funding; however, they also included public acceptability and support, a capable private partner, and efficient legal and regulatory frameworks in their list.

Jiang et al. (1996) conducted a brief literature review in which they identified 13 factors essential for success: clear objectives, an effective project manager, backing from senior management, proficient team members, adequate resource allocation, effective control mechanisms and communication channels, feedback options, client engagement, technical activities, client approval, and problem-solving. Although much of these are based on anecdotal evidence, Reside (2009) pinpointed several elements that lead to project failure, such as tariff freezing, inadequacies in project planning, design, and contracting, inflated demand forecasts, significant risk misallocation in contracts, and underappreciation of currency and other risks.

Sanni's (2016) exploratory factor-analysis identified seven key elements for successful PPP arrangements: (i) insights gained from finished projects; (ii) leadership's focus on aligning the implementation process with government goals; (iii) distribution of risk and economic policies; (iv) effective governance and political backing; (v) a short construction timeline; (vi) positive socioeconomic conditions; and (vii) provision of essential public services. A case study on the Stadium Australia project revealed the essential success factors (CSF) as: sustainable revenue; a solid consortium with knowledge, significant experience, strong prominence, and a favorable reputation; an effective approval process that aids stakeholders within a constrained

timeframe; and inventive financing approaches of the consortium (Jefferies et al., 2002).

A review of the literature on PPP use in Australia by Tang et al. (2013) identified that there are four primary categories of factors: finance, risk, stakeholder, and procurement, each of which has a number of sub-factors. According to Li et al. (2005), the three most crucial elements are suitable risk allocation, a robust and quality private consortium, and accessible financial markets. Three aspects were found to be crucial by Jacobson and Choi (2008): teamwork, open communication and trust, and commitment and shared vision. A stable macroeconomic environment, a robust and respectable corporate consortium, a favorable regulatory framework, the dedication and accountability of the public and private sectors, and adequate risk allocation and sharing are found to be important success elements for PPP projects in Hong Kong (Cheung et al., 2012).

Zhang (2005) distinguished five main categories of critical factors that could influence project performance: (i) a favourable investment climate; (ii) economic feasibility; (iii) a dependable concessionaire consortium with robust technical capabilities; (iv) a solid financial package; and (v) suitable risk distribution. According to Trafford and Proctor (2006), a joint venture's success is largely dependent on its ethos, direction, effective planning, openness, and communication. Political backing and a solid private consortium were found to be essential components for PPP project success by Dulaimi et al. (2010), however a lack of suitable skills was thought to be a contributing cause to project failure. The key elements that determine success or failure may, of course, vary depending on the level of development. For instance, elements pertaining to the socio-political and economic circumstances of PPP projects are crucial for developing regions, while elements directly related to the organisation are crucial for developed countries, even though a favourable legal and regulatory framework is a CSF in both developed and developing regions (Osei-Kyei and Chan, 2021).

Good governance, public and private sector engagement, a favourable legislative framework, strong economic strategy, and the availability of financial markets were all cited by Ismail (2013) as the key elements for successful PPP implementation in Malaysia. Wibowo and Alfen (2014) found

that 16 CSFs in Indonesia included promises to financial openness, policy consistency, and the eradication of corruption as factors that needed to be improved right away. Finally, Reside (2009) proposed that characteristics, such as internal management capability, employee productivity, inventiveness, and general corporate governance quality, might account for a significant share of the documented PPP outcomes.

The aforementioned literature is entirely qualitative. Nonetheless, a few quantitative studies have also examined the factors influencing PPP project outcomes. Reside (2009) also conducted an empirical analysis of global stress in infrastructure PPPs. In their study of East Asian infrastructure PPPs, Reside and Mendoza (2010) highlighted six critical factors impacting PPP outcomes: (i) macroeconomic context and degree of economic openness; (ii) incentive challenges throughout planning, designing, and contracting stages; (iii) political uncertainties; (iv) the government's fiscal capacity; (v) firm-embodied traits; and (vi) additional elements like regulation and the credit risk of buyers. Galilea and Medda (2010) examined transportation PPPs considering the political and economic contexts. Support from multilateral agencies is another key element that influences the termination of infrastructure PPP contracts. Marcelo Gordillo and House (2016) discovered counterfactual scenarios suggesting that multilateral support positively influenced PPP contract performance, yet they also noted that the cancellation rate for projects receiving such support was 48% greater compared to those lacking it.

The surveyed literature indicates that while there is a body of qualitative studies, there is only a few empirical research regarding the factors that might affect the success or failure of PPPs. Furthermore, none of these empirical research has focused on SAR countries, whereas similar studies conducted outside the SAR, like Reside (2009), are difficult to generalize to this region because of variations in intrinsic factors such as political climate, religion, ethnicity, colonial legacy, and development level. Moreover, a variety of important aspects, including project features, contract-related properties, investment freedom, and so on, have also been left unaddressed. This research attempts to close that gap and provide empirical support for PPP results. Using data from SAR countries and the logistic regression technique, this study looks at the main risks and pathways that could lead to favorable or adverse results. It also makes recommendations based on the findings.

4. Objectives of the Study

The main objective of the research is to evaluate the key factors that distinguish successful PPPs from those experiencing challenges or on the verge of failure. The particular objectives are to:

- Evaluate how the traits of projects and the types of contracts influence the outcomes (success or failure) of PPP projects in SAR nations;
- Identify additional risk elements that lead to project failure, broadly, in SAR region;
- Continue to refine definitions of project risks by utilizing insights from earlier research and the econometric outcomes of the present study; and
- Offer guidance to policy makers and stakeholders to help them mitigate risks and enhance the success rates of PPP projects.

5. Methodology

This section includes the sources and nature of the data set. As well, it presents the theoretical background, which details the rationale of the controls, and specifies the appropriate econometric method.

5.1. Data

The information utilized for the project-specific variables in this research comes from the WB's PPI database. Additional data sources consist of the World Development Indicators (WDI) and the Worldwide Governance Indicators (WGI) database. The data set includes projects that reached financial closure from 1993 to 2016. The PPI database comprises both PPP and non-PPP projects; to make it a purely PPP database in accordance with the PPP definition, this study excludes Divestiture and Merchant projects. The database classifies every project as active, completed, troubled, or terminated. In this study, an adverse outcome refers to a scenario where private sector investors have withdrawn from a project (a cancelled project) or are seeking an exit (a distressed project); conversely, an active and completed project status is seen as a positive outcome. Hence, the outcome variable is binary, where 1 signifies positive results and 0 indicates negative ones. Even though the data set includes

temporal details, the regression analysis treats it as cross-sectional as it represents the status of projects. Afghanistan, Bangladesh, Bhutan, India, the Maldives, Nepal, Pakistan, and Sri Lanka are the countries that are being considered in this study; however, Afghanistan, Bhutan, and the Maldives are not included in the regression analysis because of insufficient data. The dataset possesses certain constraints. It excludes social infrastructure initiatives, including those in the health and education fields, along with projects that are being renegotiated. The dataset has some limitations. It excludes social infrastructure projects, including those in health and education, along with projects that are currently being renegotiated.

5.2. Theoretical Background

PPP outcomes, particularly failures, undergo significant scrutiny by researchers and the media globally. On the surface, though, the information on PPP outcomes is not consistently discouraging; the majority of PPP initiatives globally are either ‘active’ or ‘finished.’ Despite a variety of country-specific shocks impacting the SAR region, PPP projects have demonstrated resilience to these shocks and have, for the most part, continued to operate. However, they have frequently achieved this through renegotiations, which invariably cause tensions among those involved (Reside 2009). During the 2000s, India, for example, approved over 300 highway PPPs that relied on a minimal subsidy (up to 20% of the entire project cost) sought; numerous ones were backed by the Viability Gap Fund for infrastructure PPPs with significant economic and social worth but an excessively high commercial rate (Guasch et al., 2014). Over 50% of the projects were in trouble as of 2014, leading private operators to seek contract renegotiations (ibid). Additionally, it diminishes the benefits of PPPs and often leads to a negative fiscal impact by raising government obligations.

Along with potentially seeking renegotiation, PPP risks and pressures might also cause private investors to exit the partnerships and sell their projects to new entrants. This alters the makeup of stakeholders within the partnerships — a sign of an unfavorable trend resulting from negative circumstances; certain new partners might be effective, whereas others could be exploitative. There are cases where divestitures and acquisitions took place well before the first operational decade concluded, leading to an increase in risk premium that raises the expenses of later PPP investments (Reside and Mendoza 2010).

Consequently, PPP projects, despite their apparent resilience, are constantly subject to risks and strains.

Based on the literature surveyed in section 3 and accounting for multicollinearity and data availability, this research examines the influence of a few chosen factors, emphasizing project and contract characteristics, on the success or failure of PPP projects in SAR nations. The outcome variable is therefore a binary indicator that equals 1 for a positive outcome (success) and 0 for a negative one (failure). The primary predictors, along with additional controls and related hypotheses, are outlined in the subsequent sub-sections.

5.2.1. Project Characteristics and the Essence of Agreements

Investment Sector— Energy, Transport, ICT, and Water and Sewerage (Dummy): Investment Sector—Water and Sewerage (Dummy), Transportation, Energy, and ICT: PPPs in underdeveloped nations are most likely to succeed in the energy sector (reference category¹) (reference category 1). For instance, Zhang et al. (2008) discovered that, when combined with independent regulation, privatisation increased the effectiveness of the electrical sector globally. In the case of Latin American telecom projects, Wallsten (2001) found a positive correlation between private investment and project performance, whereas Doh et al. (2004) observed a negative correlation between private investment in telecommunications (a subset of ICT) and project performance. The public nature of the water and sewerage sectors and the fact that many individuals, particularly in low-income nations, cannot afford the rates required to provide the service successfully suggest that these sectors carry particular risks (Haarmeyer and Mody, 1998). Nevertheless, SAR countries' experience in this area is insufficient to be included in econometric analysis. Depending on the discussion above, we may therefore suggest that initiatives in the ICT industry have a lower chance of success than those in the energy sector, and that projects in the transportation sector have a lower chance of

¹ One category of dummy variables, which is regarded as a reference category in econometrics, must be excluded in order to escape the dummy variable trap (Damodar, 2004, p. 302).

success than those in the energy sector. Thus, we put forth the following theories in light of the debate above.

Hypothesis 1a: Projects in the energy sector have a higher chance of success than those in the ICT sector.

Hypothesis 1b: Projects in the transportation sector are less probable to succeed compared to those in the energy sector.

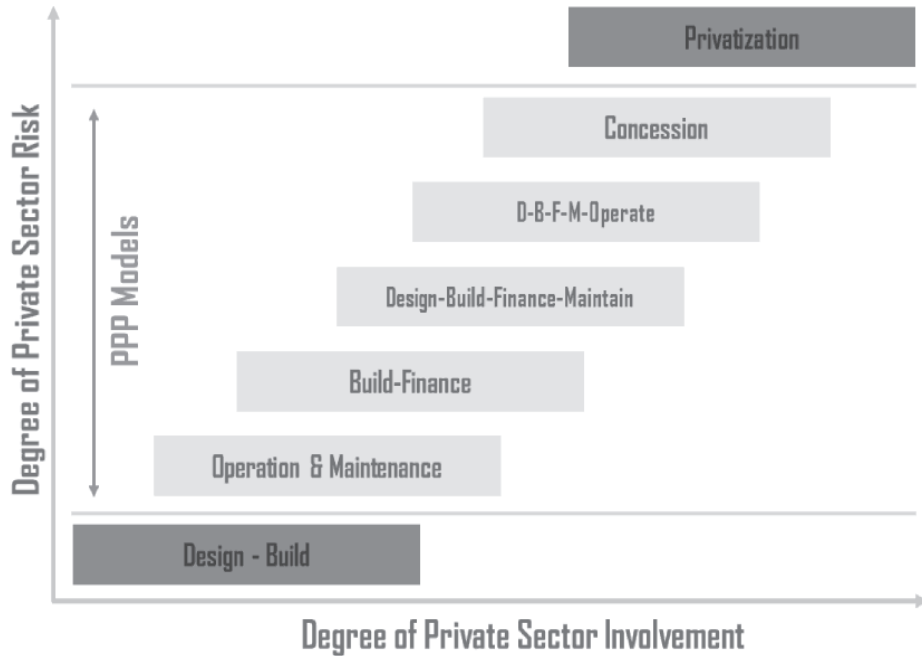
Note: the energy sector is the reference category.

Level of private participation (percent private): The possibility of shifting risk from the government to the private sector greatly affects the efficiency and cost-effectiveness of a PPP compared to public service procurement (IMF, 2004). Because the government has the authority to distribute risk among taxpayers, it typically has an edge over the private sector in managing risk (Arrow and Lind, 1978). Nevertheless, the private sector has the ability to distribute risk across financial markets, minimizing the impact of this drawback, and private sector risk managers might possess greater expertise than their government counterparts (ibid).

The public sector can shift some or all of the risks associated with project finance, planning, construction, operation, and revenue to a private entity by using a PPP model. The private sector faces reduced risk if their role is limited to planning and building the project. On the other hand, in a completely private setting, the government delegates all duties, liabilities, and benefits associated with service delivery to the private sector. This suggests that there exists a positive relationship between the level of private sector involvement and the amount of risk (refer to Figure 3). Therefore, based on the discussion above, we may hypothesize that a higher level of private involvement increases the likelihood of successful PPP results.

Hypothesis 2: Greater levels of private involvement increase the likelihood of successful PPP outcomes.

Figure 3: Transfer of Risk and Private Sector Involvement in PPPs



Source: The Canadian Council for Public Private Partnership (CCPPP)

Level of government awarding the contract (a dummy: 0 for local and 1 for national): Local governments bear fewer responsibilities than national governments, which have a lot of work to do. As a result, local governments are able to monitor and manage projects more closely, increasing the chances that they will succeed. In other words, local governments are better at guiding initiatives to success than are federal governments.

Hypothesis 3: Local governments are better at guiding initiatives to success than are federal governments.

Number of sponsors (0 indicates one sponsor and 1 indicates two or more sponsors): Compared to a project with only one sponsor, a project backed by multiple sponsors is expected to have a higher likelihood of success. Maintaining an appropriate mix of global and local expertise is essential, and the quality of the team is particularly vital due to the potential technical,

economic, and political complexities involved in PPPs" (World Bank Group [WBG], 2014, p. 16). The likelihood of integrating various essential talents and efficiency will increase with the number of sponsors. Furthermore, the possibility of moral hazard can be reduced by establishing checks and balances. Furthermore, a blend of local and international experience can be obtained if the group of companies includes foreign companies.

Hypothesis 4: A PPP project is more likely to succeed if it has multiple private sponsors.

Multilateral/bilateral support: There is an allegation made against the members of the World Bank Group that, in many instances, they pursue their own interests. They overlook the primary challenges faced by developing nations, including the shortage of local expertise and resources needed for creating a PPP pipeline and developing viable PPP projects, among others. Since the 1950s, multilateral financial institutions (MFIs) like the WB and IMF have acted as agents of policy transformation by funding public initiatives in numerous countries while exerting a certain level of external pressure on the host governments of PPP projects (Henisz et al., 2005). Moreover, the majority of their backing for PPP portfolios is situated in wealthier nations and in markets that have well-established PPP frameworks. For instance, the IEG (2015) report clearly indicates that the Multilateral Investment Guarantee Agency (MIGA), part of the Bank Group, bolstered investor confidence and successfully executed PPPs in nations enhancing their PPP frameworks. The report indicates that investment flows to PPPs from the International Finance Corporation (IFC), which is also part of the Bank Group, are directed towards countries and markets that have well-developed enabling environments for PPPs.

Therefore, there are grounds for thinking that the WBG's private-sector-focused branches genuinely support corporate capitalism or commercial interests, which is a covert neo-colonialist goal. Furthermore, stakeholders may be less motivated to carry out projects with due diligence if they receive bilateral or multilateral support, which increases the possibility of moral hazard and adverse selection and increases the chance of project failure. Although it appears reasonable to assume that obtaining bilateral or multilateral backing enhances the likelihood of a PPP project being successful, the aforementioned

facts and reasoning suggest that, in reality, it could negatively affect PPP results in SA and other nations.

Hypothesis 5: PPPs financed by bilateral or multilateral financial entities generally possess higher rates.

Size of the project: Due to variations in manageability, project size, as measured by the total amount invested in a project, can affect whether a project succeeds or fails. Bigger projects are more likely to be cancelled since they are more fragile and could put a significant financial strain on the government (Harris and Pratap, 2009).

Hypothesis 6: Smaller projects tend to have a higher success rate compared to larger projects.

5.2.2. Macroeconomic Performance

Macroeconomic performance, primarily evaluated through per capita GDP, GDP growth, and price stability, evaluates a nation's economic strengths or vulnerabilities and can influence a government's ability to handle fiscal risk. These indicators aid in giving a general understanding of the economic conditions existing during two important stages of the project cycle — the project's design and operational phases (Reside, 2009). It is quite likely that strong economic growth during the operational phase will lead to a positive result for the project. This study, however, solely captures the macroeconomic context at the project design phase to assess how these factors affect stakeholders' mindsets, possibly resulting in moral hazard or adverse selection problems.

Increased GDP growth rates during project planning and design phases, or when securing financial closure, can lead stakeholders to overstate demand and may encourage them to pursue mega projects. Indeed, overestimating benefits or underestimating costs is another form of rent-seeking behavior, leading to a fabricated reality of distortions that makes it very challenging to determine which initiatives are worthwhile and which are not (Flyvbjerg et al., 2002 and Flyvbjerg et al., 2003). This bias in forecasting can, in fact, lead to increased project expenses and later losses, potentially harming the overall outcomes of the project. Conversely, swift expansion during the planning and

design stage could prompt the government to sanction riskier projects without adequately evaluating the incentives of advocates and examining the project's viability (Reside and Mendoza, 2010) — demonstrating adverse selection that may heighten the chances of project failure.

GDP per capita: GDP per capita reflects the purchasing capacity of individuals and the extent of a nation's economic activities; elevated values of this metric signify greater demand for infrastructure and the opposite is true as well. It can be inferred that nations with a higher GDP per capita during the project-planning stage are likely to possess superior facilities for system development, making project failures in these countries less probable.

Inflation: Mistakes in predicting price levels during the planning stage and inability to pinpoint reasons for price increases can adversely affect project results. For instance, rent-seeking parties may regard significant inflation (or inconsistent inflation) during the design phase as a chance for profit, expecting a rise in the return on investment (ROI) — indicative of moral hazard. Nonetheless, inflation may not consistently reflect a widespread and uniform increase in prices across the economy, especially in developing countries. Inflation may arise from a significant rise in the cost of raw materials, while the prices of end products remain relatively unchanged. If this is accurate, it is highly probable that considerable inflation in the design phase will adversely affect the project outcomes — opposite to what the investors expect.

5.2.3. Public Sector Fiscal Capacity

Fiscal capacity enables governments to be more selective in accommodating PPP projects without depending on foreign aid, which introduces economic uncertainty and political embarrassment. Conversely, nations with significant fiscal deficits often depend on foreign aid, like official development assistance (ODA), to fund their initiatives.

ODA (net) received as a share of GNI: In the least developed nations, development assistance is a contentious topic. In order to improve infrastructure in developing nations, proponents view foreign aid as an addition to local savings, the availability of foreign exchange, and the transfer of labor and knowledge. Despite its merits, the ODA definition has consistently represented a trade-off between statistical realism and political expediency (Hynes and

Scott, 2013). It can occasionally displace domestic savings, particularly those in the public sector, and in practice, it makes it easier for the recipient nation to drain its resources through royalties, dividends, debt repayment, interest payments, and other means. The sovereignty of the recipient nation is likewise seriously jeopardized by the "conditionality clause (to procure expensive goods and services from donor nations, etc.)" that is frequently mandated by multilateral organizations.

However, ODA can provide support and potentially enhance the feasibility of projects for investors. Donors typically favor privatization and allocate a significant portion of their aid funds to support private enterprises abroad. Additionally, a portion of development aid routed through the government budget may serve as a guarantee to support a PPP initiative (Zen and Regan, 2014). Thus, it appears reasonable to believe that ODA has a beneficial impact on PPP outcomes.

5.2.4. Legal and Institutional Quality

Regulatory quality: Among the six major characteristics of governance, regulatory quality is assessed based on a governance estimate that ranges from roughly -2.5 (weakest) to 2.5 (strongest). It captures views on a government's ability to formulate and implement reasonable laws and rules (like the ROR regulation) that can avert negative shocks and promote the growth of the private sector. This variable creates the favorable conditions for carrying out and safeguarding long-term PPP contracts through explicit legislation and administrative discretion (Kim, 2017). In projects that get government funding, moral hazard may be made worse by subpar regulations, raising the likelihood of failure. On the other hand, a stable and encouraging regulatory framework is frequently thought to be a crucial requirement for PPP project success.

Investment freedom (index): Investment freedom indicates a setting in which there are no limitations on the movement of investment capital, allowing individuals and companies to allocate their resources into and out of particular activities, both domestically and internationally, without any hindrance. A higher index score indicates greater economic flexibility, which should result in better project outcomes.

5.3. Econometric Models

The binary outcome variable, project outcomes — success or failure — necessitates the application of a logistic model, where 0 indicates project failure and 1 signifies project success. It can be represented as Y_i , which adheres to the binomial distribution $Y_i \sim B(n_i, \pi_i)$, where π_i indicates the probability that $Y_i = 1$ (that is, the event takes place) and thus $(1 - \pi_i)$ is the probability that $Y_i = 0$ (meaning, the event does take place), with individual data $n_i = 1$ for all i .

$$\text{logit}(\pi_i) = x_i' \beta \quad (1)$$

where, x_i denotes the vector of covariates and β represents a vector of regression coefficients. The model described in Equation (1) is a generalized linear model featuring a binomial response and using the logit link.

6. Discussion of Regression Findings

Table 6 displays the regression findings regarding the factors influencing the success and failure of PPP projects in South Asian countries, particularly focusing on the role of the project and contract. The regression findings align with the majority of the hypotheses mentioned earlier.

Table 6: Regression results

Regressors	Coefficients	Standard errors	Odds ratios
ICT (Primary sector 2)	-7.476***	1.6470	0.0006
Transport (Primary sector 3)	-2.822***	0.7477	0.0595
Level of private participation	0.048**	0.0189	1.0489
Government level	-2.108***	0.6013	0.1215
Number of sponsors	0.704	0.4717	2.0217
Multilateral/bilateral support (MLS/BLS)	-0.649	0.6038	0.5228

Project scale (amount of investment)	-0.001**	0.0003	0.9994
GDP per capita	0.0002	0.0003	1.0002
GDP growth	0.089	0.1090	1.0930
Inflation (GDP deflator)	-0.176*	0.0962	0.8390
ODA as percent of GNI	1.545**	0.6267	4.6857
Regulatory quality	5.796***	2.1659	329.1028
Investment freedom	0.071**	0.0336	1.0737
Intercept	2.020	3.1097	7.5393

When controlling for all other variables, the log-odds (indicating the strength of association between two occurrences) of achieving project success is expected to drop by 7.48 for each additional unit of investment in an ICT project (compared to an energy project, which serves as the reference category). This indicates that the ICT dummy has a negative association with project success, implying that this industry is more likely to experience failures. In other words, the likelihood of ICT projects being successful is 0.0006 times less than that of energy projects. The ICT sector has a greater failure rate, which is probably structural in nature. This is due to the rapid evolution of technology and there is constant pressure to deliver, which leaves little opportunity for staff to gain experience. Due to the low entry barriers in this sector, projects typically involve a large number of people, which results in a highly decentralized decision-making process within the team. The project may collapse due to issues with coordination between the several sections and significant operational and administrative costs. In a similar vein, PPP project outcomes are adversely correlated with the transport industry, and projects in this area have a 0.0595-fold lower chance of success than those in the energy sector.

A characteristic of the contract, specifically the extent of private participation, has been shown to significantly enhance project success (at a significance level at $p < 0.05$). With each percentage point rise in private involvement in the project, its likelihood of success increases by a factor of 1.05. According to the significantly negative coefficient of government dummy,

negotiations with national governments are less likely to succeed compared to those involving other government levels (like local governments). As was previously noted, local governments are able to take a more active and direct approach to projects that are discussed with them since they have fewer duties than national governments. This enhances the possibility that the project will succeed.

The size of a project also influences the results of the project. The regression analysis indicates that this control has an adverse effect on project success, suggesting that larger projects are more likely to fail than smaller ones. The adverse effect is, nevertheless, quite minimal: just a 0.06% drop in the probability of success for each one-million dollar rise in investment.

The size of a project is also important for influencing its outcomes. The regression analysis indicates that this control adversely impacts project success, suggesting that larger projects are more likely to fail than smaller ones. The adverse effect is, nonetheless, minimal: just a 0.06% reduction in the probability of success for each additional million dollars invested.

PPP proponents are likely to sway host nations and businesses by offering inflated projections and hopeful results. Projects may fail if they are started while influenced by these prejudices. Size is important when it comes to big-bet projects; larger projects tend to have higher failure rates, particularly due to inadequate preliminary appraisal and execution coordination. Smaller projects are less likely to experience the complexity of coordinating numerous interdependent tasks that capital projects do. Significant overruns in project time and costs may arise from inadequate planning, unbalanced terms and conditions, lack of controls, and flawed risk management. To reduce the likelihood of failure in large-scale projects, stakeholders might consider strategies such as breaking the projects down into smaller sub-projects.

In SAR nations, macroeconomic instability, as measured by inflation, is found to have a negative correlation with project outcomes. Macroeconomic theory suggests that central banks might elevate interest rates to tackle inflation, resulting in higher borrowing costs and a greater chance of project failure. As predicted, ODA significantly improves project success (below the 5% threshold), indicating that PPPs supported by ODA are less likely to fail and that PPPs may benefit from ODA.

The regression results indicate that with every rise in the regulatory quality score, the likelihood of project success improves by approximately a factor of 329. This implies that robust and favorable regulatory quality results in improved project outcomes. It has also been observed that investment freedom significantly enhances project success, supporting the previously formulated hypothesis.

7. Conclusion

Developing and initiating sustainable and resilient PPPs presents several challenges, particularly for nations in South Asia. They may result in success or severe failure — usually depending on a project's unique characteristics, macroeconomic conditions, the host country's legal and institutional standards, and ultimately the perspectives of stakeholders that could lead to moral hazard and adverse selection issues. The research finds that increased levels of private engagement, involving proper risk transfer from the government to the private sector, are essential for the success of PPPs in SAR. A governmental body with the proper legal and regulatory structure seems to also influence the results of a PPP project in this area. For success, these arrangements need stable macroeconomic conditions (low inflation). Projects of a smaller scale and those carried out by local public sector entities have a higher chance of success, as they can be monitored more closely.

However, the factors considered in this study are not the sole ones that influence project results. In numerous studies, they rank at or close to the top, but there are several additional success/failure elements beyond those noted. For instance, aspects such as the sponsors' nationality, the effectiveness of the government, fiscal balance, governmental support, bidding criteria, award methods, debt-to-equity ratio, and others are important to take into account. Although these elements could not be included in this research due to a lack of data, they ought to be explored in future studies.

The sensitivity surrounding PPP modalities necessitates that the public sector exercises caution in selecting PPPs and upholds total integrity and transparency to prevent conflicts of interest and fraudulent actions during the procurement and implementation stages of projects. This necessitates a setting in which the PPP provider stays publicly responsible for the project's

implementation in line with the agreement's terms and conditions. Negative outcomes in PPPs can result from adverse selection by the public sector or any immoral behavior/moral hazard occurring during the implementation phases. In light of this, this paper proposes that suitable and efficient oversight, the ability to adjust amidst evolving local and global conditions, focused attention, and an openness to learn from previous errors are all essential for enhancing the chances of project success. To create a robust and successful partnership, it is crucial to align public and private interests properly, including addressing what attracts private sector investors to a project.

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