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## Determinants of outcomes of Public-Private Partnerships (PPP) in infrastructure in Asia

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**Determinants of Outcomes of Public-Private  
Partnerships (PPP) in Infrastructure in Asia**

by

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# **Determinants of Outcomes of Public-Private Partnerships (PPP) in Infrastructure in Asia**

**Renato E. Reside, Jr. and Amado M. Mendoza, Jr.<sup>a</sup>**

## **Abstract**

This study analyzes cross-country data extracted from a large global database to identify the major risks affecting Asian PPP into six major factors: (1) macroeconomic environment; openness of economy; (2) incentive issues during planning, design and contracting phases; (3) political risk; (4) fiscal capacity of government; (5) firm-embodied traits: level of technical efficiency and capacity of proponents in construction and operations; and (6) other reasons - regulation, credit risk of buyers of output, etc. Policy recommendations are made.

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## I. Introduction

A nation's capacity and readiness to undertake PPP in infrastructure depends on many factors. Among these are risk factors specific to the country, such as the macroeconomic environment, and legal and regulatory regimes; factors specific to projects themselves, such as contracts; and whether or not government and private sector participants such as investors and suppliers can agree on an acceptable allocation of risks. Thus, PPP investment projects often reach closure when stakeholders perceive that an acceptable risk allocation *ex ante* has been achieved. Subsequently, risk allocation is contracted, and the project is implemented. But while investments are driven by risk allocation *ex ante*, the success or failure of privatization always depends on the realization of risks *ex post*.

This study looks at investment outcomes of projects *ex post*, with a focus on East Asia, evaluating business and economic outcomes using empirical methods to identify major risks and channels through which adverse outcomes evolve affecting PPP and draws lessons from these experiences. One of the main messages culled from the empirical results suggests that political risk plays a strong role in adverse project outcomes, and that political risk usually evolves from a realization of macroeconomic risk. In other words, political risk is correlated with macroeconomic risk in many instances. Political decisions made by chief executives of countries, such as tariff freezes, can have sweeping adverse effects on most or all of the projects in a country, but this is usually preceded by some macroeconomic crisis or some macroeconomic shock, such as, for instance, the Asian crisis, or a surge in commodity prices. Empirical work also strives to identify the political circumstances which make realization of political risk more or less likely.

Stress is defined as a situation where private sector proponents have exited, or are contemplating exit from a project. Information on stress was derived from the World Bank's Private Participation in Infrastructure (PPI) dataset, which was used as the source for much of the data used in the estimation. This global dataset contains project-specific information on a large number of projects classifiable as PPP, including the total value of investment, sector, sub-sector, type of transaction, and multilateral participation. It covers projects which achieved financial closure from 1984 up to the present. The data is cross-sectional, with projects classified according to their current status (i.e., whether they are operational, distressed, cancelled, or concluded). Although the data is cross-sectional, it contains temporal information that can also be used in analysis. Because the sample period spans the emergence of PPP in the late 1980s, through the Asian crisis, and beyond, the sample includes many projects that have undergone the most tumultuous experiences in PPP, as well as the periods of consolidation that followed. The PPI dataset is augmented by country-specific macroeconomic data and, where available, additional project-specific data such as country growth and exchange rate information.

The data has limitations, however. Information on bid and tendering procedures, and the criteria for awards are not available for most projects. Also, owing to the lack of complete global data, other forms of stress are not included in the empirical analysis, such as the incidence of renegotiations around the world.<sup>1</sup>

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<sup>1</sup> Although estimates of the incidence of renegotiation are presented in Table 8.

Analyzing project stress in PPP projects is vital because the benefits of privatization are contingent on projects working smoothly: concessions having ample resources to realize their investment requirements, for instance, or toll roads being properly maintained, or seaports and airports serving commercial and passenger customers efficiently. Project stress is clearly a major factor behind the inconsistent quality of outcomes of privatization around the world. Analyzing and addressing stress also helps stakeholders enhance PPP's attractiveness as an investment. This is crucial because this helps prevent fiscally and socially costly consequences of poorly designed and managed projects.

## II. PPP: Origins in Latin America and Spread to Asia

The wave of privatization of public services in Latin America in the 1970s and 1980s was seen as a response by states mainly to hard public budget constraints, as well as a need to improve chronically inefficient delivery of electricity, water, transport and telecommunications services by state-owned enterprises. Multilateral financial institutions (MFIs) encouraged the pursuit of infrastructure privatization for a number of reasons. It was envisioned that improvements in service provision and efficiency would in the long-run mitigate the lost benefits of state-provision. Privatization was also expected to help relieve state budgets, which had been perpetually strained by state-owned enterprises operating energy, transport, telecommunications and water services. Finally, it was argued that deficit-biased countries could count on privatization to achieve macroeconomic stabilization; this in turn would help relieve pressures on prices and on monetary policy in general.

In a typical privatization of infrastructure, states would contract the services of private sector proponents in building and/or then operating facilities to deliver such services. The resulting power generation, water supply, water treatment, power distribution, toll road, airport, or seaport facilities (among many more possible infrastructure options), would then be regulated on the basis of price by the government based on the principle that they were natural monopolies. Chile, followed by Argentina, began to pursue bold programs in privatization. Over the last 30 years, the rest of the developing world, in varying levels of intensity, would follow suit, prompted by widening gaps between public resources and the perceived demand for infrastructure (Table 1; Yang 2008; Dailami and Leipziger 1998; Fay and Yepes 2003).

**Table 1: Expected Annual Infrastructure Needs in Emerging markets, 2005-2010**

By income group	New		Maintenance		Total	
	US\$Mn	% GDP	US\$Mn	% GDP	US\$Mn	% GDP
Low Income	49,988	3.18	58,619	3.73	108,607	6.92
Middle Income	183,151	2.64	173,035	2.50	356,187	5.14
High Income	135,956	0.42	247,970	0.76	383,926	1.18
<b>Developing Countries by Region</b>						
East Asia & Pacific	99,906	3.67	78,986	2.90	178,892	6.57
Europe & Central Asia	39,069	2.76	58,849	4.16	97,918	6.92
Latin America & Caribbean	37,944	1.62	32,878	1.40	70,822	3.02
Middle East & North	14,884	2.37	13,264	2.11	28,148	4.48

Africa						
South Asia	28,069	3.06	35,033	3.82	63,101	6.87
Sub-Saharan Africa	13,268	2.84	12,644	2.71	25,912	5.55
<b>All developing countries</b>	233,139	2.74	231,654	2.73	464,793	5.47

Source: Fay and Yepes 2003

Many privatizations in Latin America did not yield very good economic (or social) outcomes. Often, the scope of what proponents could accomplish was limited by social and political constraints. Project outcomes would be further compromised by sheer incompetence of the private proponents and public planning agencies, or by macroeconomic crises, such as the Mexican crisis in 1994. Such crises would lead to massive realizations of demand or currency risk, whose ultimate burden would fall on stakeholders. For instance, contracts could specify protection for private investors against currency risk, in which case governments end up shouldering the cost of currency risk after currency devaluation. Since building infrastructure can sometimes require many imported components, devaluations could also necessitate large increases in the price of utilities, putting them at odds with regulatory authorities, as well as the consuming public at large. Either way, PPP in Latin America would be undermined and risk premia for future projects would be raised, raising the cost of future financing for such projects.

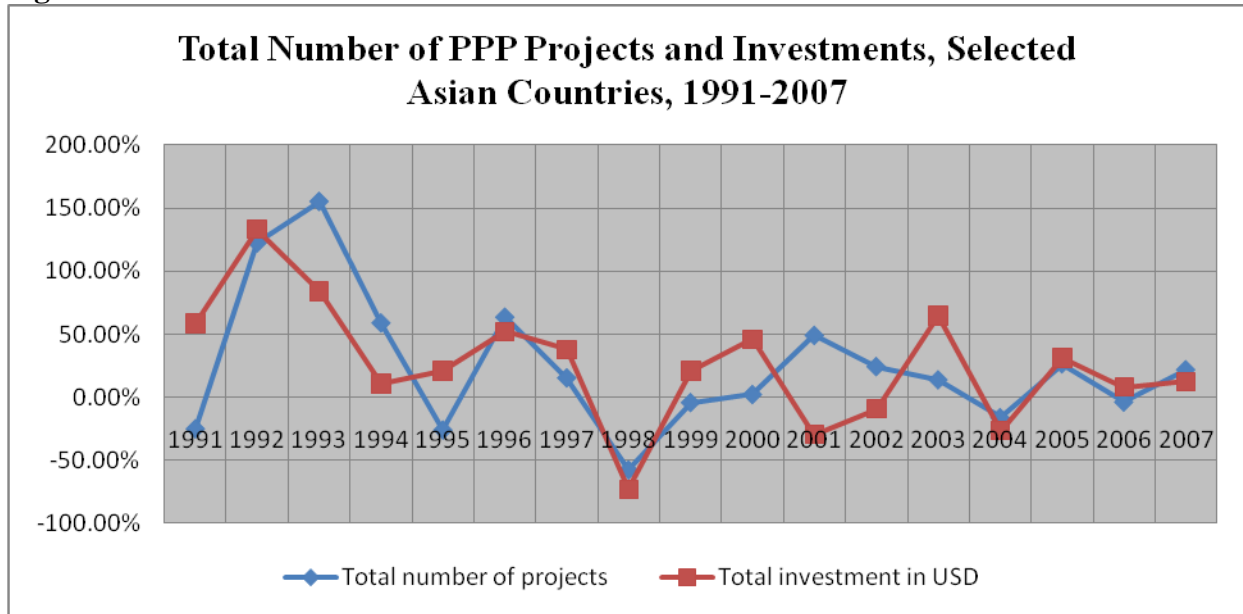
In light of the Mexican crisis, and particularly because of dynamic growth in the 1990s of East Asian economies (starting with the Southeast Asian economies in the early to mid-1990s, and continuing with China in the late 1990s), many private proponents of these public-private partnerships (PPP) in infrastructure, shifted their investment focus to East Asia, accounting for large proportions of capital flows to countries such as Malaysia, Thailand, Indonesia and the Philippines.

While hard public budget constraints were major motivations for privatization in Latin America in the 1980s, the same does not appear to be true for the major privatizing East Asian countries. For Asian countries with major PPP portfolios (especially the major Southeast Asian countries), the major growth period for PPP projects occurred during periods in the early- to mid-1990s in which national governments in such countries experienced declining budget deficits or ran fiscal surpluses. Figure 1 shows central government fiscal balances to GDP ratios in selected Asian countries from 1987 to 2007. In Figure 1, the area enclosed by the shaded rectangle marks the years 1990-1996, when most governments ran fiscal surpluses, also the years of heaviest investment in PPP projects.

**Figure 1**



**Figure 2**



As privatization of infrastructure proliferated around the world, new modalities of public-private partnerships (PPP) in infrastructure emerged in response to stakeholders' evolving preferences in areas of ownership and control, which in turn reflected their differing attitudes towards risk-bearing. The divestment model gave way to more complex modes of PPP, such as concessions of existing assets, greenfield investment, and management contracts.

Given the relative abundance of fiscal space and fast growth in the major implementers of PPP in the 1990s and their relatively robust growth rates during that time, *it would appear therefore, that the major motivation behind the proliferation of PPP projects in the early to mid-1990s was the desire for quicker methods of (large-scale) project financing, planning and execution, to a lesser extent hindered by bureaucratic delays and promising better quality than*

*purely public infrastructure.* Quicker modalities were also necessitated by strong economic growth fuelling rapid growth in infrastructure demand, as well as the perceived need by countries to upgrade infrastructure in a region where sustaining investment competitiveness was essential.

PPP in the Asian region commenced in China in 1984 within the context of Deng Xiaoping’s Great Leap Forward with the commissioning in Guangzhou Province of the Foshan City Power Plant, a greenfield project implemented in the Build-Own-Operate (BOO) mode. The table below lists Asian countries and the years of their first PPP infrastructure projects. Note that most countries commenced implementing projects in the early to mid-1990s. China was the first to commence privatization of infrastructure, in 1984. Smaller Pacific islands followed in the late 1980s followed by major Southeast Asian countries in the early 1990s.

**Table 2**

Country	Year of First PPP	Country	Year of First PPP
China	1984	Lao PDR	1996
Kiribati	1988	Papua New Guinea	1996
Solomon Islands	1989	Vietnam	1996
Philippines	1990	Cambodia	1997
Indonesia	1992	Samoa	1997
Malaysia	1992	American Samoa	1999
Thailand	1993	Tonga	2000
Vanuatu	1994	Timor-Leste	2002
Mongolia	1995	Fiji	2003
Myanmar	1995		

Source: World Bank PPI Database

Major PPP activity in East Asia would take place during the early 1990s. After the first privatization took place in China in 1984, two more private power plants were commissioned there in 1986 and 1989. ASEAN countries followed suit. Gas Malaysia was incorporated on 16 May 1992 to construct and operate the natural gas distribution system (NGDS) within Peninsular Malaysia. The power generation project of the Kaset Thai Sugar Co Ltd commenced operations as a Build-Operate-Own project in 1993. The sugar company converted waste bagasse into electrical power. The Philippines had somewhat unique motivations for jump-starting PPPs. It was hit by frequent power shortages in the mid-1990s, as energy infrastructure suffered from severe lack of public investment as the country grew.

Because of the seminal nature of PPP in infrastructure in the 1980s and 1990s, most of the early projects depended on patchworks or modified versions of the country’s procurement laws in order to be developed. Among Asian countries, only the Philippines would ratify a formal Build-Operate-Transfer (BOT) law, prompted in large part, by the need to facilitate procurement of independent power producers (IPPs) to rapidly augment the country’s power supplies. Persistent blackouts had been crippling industry in the country, and formal legal structures and institutions needed to be in place to speed up the building of extra capacity. The BOT Law in the Philippines also mandated the government to set up a formal PPP unit within



government, dedicated to one-stop-shop servicing of investors. An alternative to setting up a formal PPP unit was to augment capabilities within the country's planning ministry.

That the major developing Asian implementing countries ran fiscal surpluses in the early 1990s helped fuel PPP growth. Ample fiscal space allowed countries to assume certain risks in projects. Ironically, however, the level of risk assumed was sometimes inversely proportional to fiscal space. In the Philippines prior to the 1997 Asian crisis, the national electric utility, the offtaker for all independent power producers (IPPs) assumed all currency risks, which was not the case in Thailand. This notwithstanding, contingent liabilities associated with government guarantees for such projects had not yet accumulated to alarming levels (or were ignored totally) and private proponents could have projects approved quickly with explicit or implicit guarantees without governments worrying about their fiscal exposures to such projects. In addition, fairly stable exchange rates in the region helped limit realizations of currency risk.

The first wave of Southeast Asian PPP occurred during the years 1992-1993. The table below lists the initial projects in selected Asian countries:

**Table 3: Asian countries' initial experiences with PPP**

Country	Year of first PPP	Project	Current Status	Type of project	Modality	Sector	Sub-sector
China	1984	Foshan City Power Supply Factory Co.	Operational	Greenfield project	Build, own, and operate	Energy	Electricity generation
China	1984	Foshan City Power Supply Factory Co.	Operational	Greenfield project	Build, own, and operate	Energy	Electricity generation
China	1986	Guangdong Daya Bay Nuclear Power Station	Operational	Greenfield project	Build, operate, and transfer	Energy	Electricity generation
China	1989	Shenzhen Guang-Shen Shajiao B Electric Company Ltd.	Concluded	Greenfield project	Build, operate, and transfer	Energy	Electricity generation
Indonesia	1992	PT Cikarang Listrindo	Operational	Greenfield project	Build, own, and operate	Energy	Electricity generation
Malaysia	1992	Gas Malaysia	Operational	Greenfield project	Build, own, and	Energy	Natural gas distribution

		Sdn Bhd			operate		
Philippines	1991	Navotas Diesel Power Plants	Cancelled	Greenfield project	Build, operate, and transfer	Energy	Electricity generation
Thailand	1993	Kaset Thai Sugar Co. Ltd.	Operational	Greenfield project	Build, own, and operate	Energy	Electricity generation

Source: World Bank PPI Database

### III. Overview of Current Stock of PPP Investments in East Asia and the Pacific

Table 4 shows the sectoral breakdown of current PPP projects in East Asia and the Pacific as of end-2008. The energy sector comprises the bulk of PPP projects in the region. Transport projects (seaports, airports, highways, and bridges) account for the second largest share, followed by telecommunications, then water and sewerage. The sectoral breakdown reflects two key PPP investment patterns: sectors with cross-border applications and impact, such as energy and transport, attract the biggest investments, while sectors with more local applications - telecoms and water and sewerage - see least investment. This is quite similar to the global PPP breakdown.

**Table 4: Projects in the World Bank's PPI database Broken Down by Sector**

Sector	Percent of total	Number of projects
Energy	42.55%	494
Telecom	5.77%	67
Transport	27.05%	314
Water and sewerage	24.63%	286
Total		1,161

(Source: Author's calculations based on data from the World Bank PPI database)

The table above shows a sectoral breakdown of PPP projects in the East Asian region. Almost half of the projects are in the energy sector, with transport and water related projects split almost evenly among themselves for the balance. Telecoms projects do not account for a major portion of East Asian PPP.

The sectoral breakdown of projects reflects the relative degree of development of, as well as demand for particular infrastructure in East Asia and the Pacific. The region requires large quantities of energy resources to sustain its development, so energy projects top the list. Transport projects come in second, as growing markets and open economies require easy accessibility to and from markets, as well as ports for delivery of goods and services. Water and sewerage services are also increasingly in demand, to enhance health and sanitation in the region. Telecom services PPP are lagging, a reflection perhaps of the sophisticated public communications networks already in place in the East Asian region.

**Table 5**

Structure	Percent of total	Number of projects
Greenfield project	61.58%	715
Management and lease contract	2.07%	24
Concession	25.67%	298
Divestiture	10.68%	124
Total		1,161

(Source: World Bank PPI Database)

The table above shows a breakdown of East Asian PPP by transaction structure. A large amount of projects are greenfield in nature, implying that much of PPP investment has been devoted to the servicing of new (“green”) markets, markets that have come about because publicly-generated supply has not kept pace with rising demand. This can be expected of the Asian region, where countries have been growing rapidly.

**Table 6**

Government granting contract	Percent of total	Number of projects
Federal	59.78%	694
Local	40.22%	467
Total		1,161

(Source: World Bank PPI Database)

The above table shows the breakdown between federally-contracted PPPs in the region and locally-contracted PPPs.<sup>3</sup> The balance of projects had contracting parties that have not been identified. Through the years, devolution in the Asian region has made it possible for autonomous local governments to engage in PPPs. The federal-local distinction is potentially important because of capacity and coordination issues. Federal government-implemented PPPs may yield better outcomes than local PPPs because federal governments may be more acquainted with large-scale project planning and development, and therefore have more and better human resources available for these activities.

**Table 7**

Type of support from multilaterals	Percent of total	Number of projects
Loan	4.05%	47
Equity	1.29%	15
Risk management	0.17%	2
Guarantee	1.64%	19

(Source: World Bank PPI Database)

The table above provides a breakdown of PPP projects supported by multilateral development institutions. Multilateral financial institution support around the world for PPP

<sup>3</sup> See the World Bank’s PPI Database for definitions of federally-contracted PPP. It is however understood that federally-contracted PPP are those contracted with central or national governments.

projects can be rationalized on several grounds, among them the need by foreign private project proponents for strong political backing from institutions with clout over the local government, as well as an explicit desire by multilateral financial institutions themselves to have a stake in profitable projects. Compared to other regions in the world, multilateral support for PPP in the Asian region is not widespread, suggesting that the overwhelming majority of projects have not required their technical or financial inputs. Most projects in the region have evolved into pure public and private endeavours. One possible reason is the more intimate relationships foreign PPP investors have with East Asia and the Pacific governments (relative to other governments in the world). With their export-oriented economies having been fuelled by FDI in years past, governments in the Asian region have developed an enhanced awareness of the role played by FDI in development. Another possible reason for the sparse presence of multilaterals in Asian PPP is the negative backlash on the multilaterals themselves from problems experienced in PPP projects earlier in Latin America.

#### **IV. Determinants of Project Outcomes: Stress and Risk Factors in PPP Investments in Asia**

##### **Profile of PPP Failures and Stress in East Asia**

Although PPP failures get tremendous scrutiny from researchers and the media, data would show that an overwhelming number of projects worldwide are neither “cancelled” nor “distressed”. Of the roughly 4,000 projects in the World Bank’s PPI database, only 57 are listed as distressed, and only 185 are listed as cancelled. Of the 57 distressed projects as of end-2008, only one is located in Asia. However, of the 185 projects listed as cancelled, 65 of them, or roughly 35.14% are located in the Asian region.

In spite of these stresses, projects in Asia have by and large remained operational. Thus, although infrastructure projects have suffered the extent of country-specific, regional and global shocks in the last three decades, as a whole, projects appear to have been quite resilient. Given their inherently long gestation periods, it would seem that in general, project developers, firms, investors, governments, and customers have adapted to volatile project cycle environments. Project cancellations also tend to be quite rare in the East Asian region because the countries in the region have always tended to have relatively hospitable environments for foreign direct investment. Moreover, many of these projects have been planned with the enhancement of export and/or investment competitiveness in mind.

On the surface, the data on PPP is encouraging. But beneath the veneer of resiliency lies considerable stress. Where PPP projects in Asia and anywhere else *have* run into difficulties, renegotiations have been the norm. Although the experience in Latin America has shown that renegotiations can often be opportunistic (Guasch 2004), the judicious use of renegotiation (by both governments and firms) could in fact be responsible for the resiliency of projects. This notwithstanding, renegotiations always raise tensions among stakeholders – governments, investors and consumers. Divestment can be, and in many instances has been, another response to risk.<sup>4</sup> Many recent PPP divestments have involved the exit of original foreign investors in favor of new foreign players or emerging domestic private investors. Thus, while most projects

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<sup>4</sup> A more comprehensive study of the pattern of global divestments, as well as global renegotiations in PPP, is left for further study.

have retained private equity investment, the nationality and composition of the private investors have changed.

**Table 8: Estimated Renegotiated PPP Contracts in East Asia, 1986-2008**

Projects with contracts renegotiated	826
Proportion of world projects	20.77%
Proportion of East Asia projects	71%

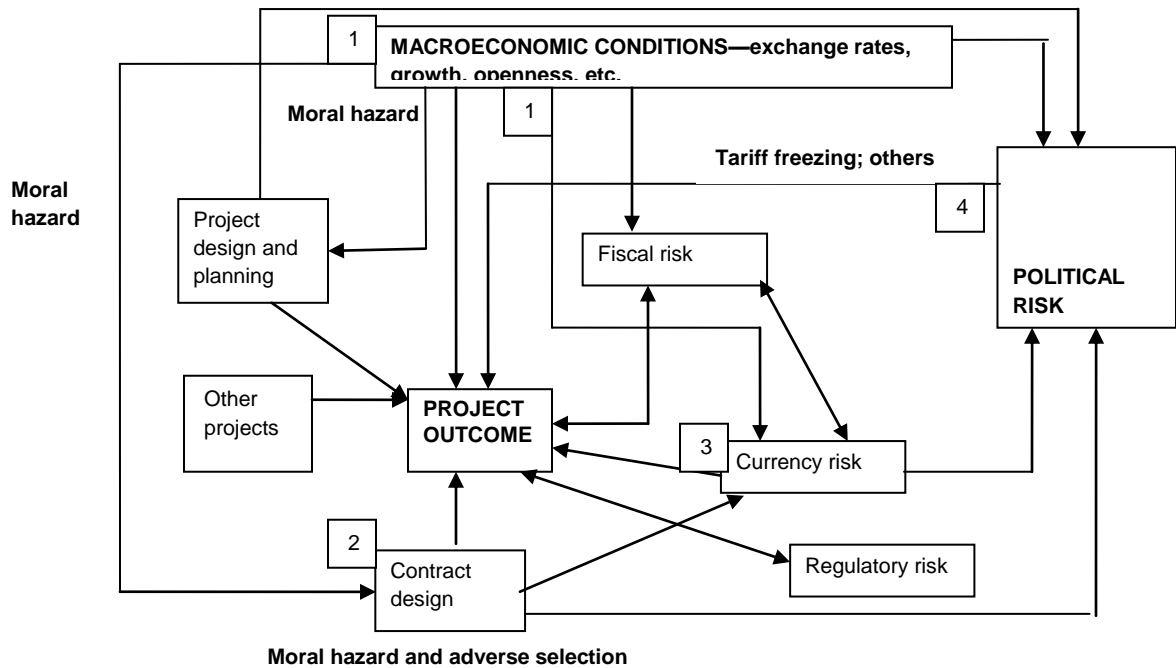
Source: Author's estimate using a survey of past PPP studies, Guasch (2004) and news reports from the Asian region

In the past decade, global macroeconomic shocks and other factors have led to divestments and renegotiations in Asia and Latin America. Table 8 above lists the estimated frequency of renegotiations in East Asia alone. The large number of estimated renegotiations in East Asia has not only been due to volatility experienced during the Asian crisis. Uncertainties experienced by investors in the People's Republic of China (PRC) have also been a contributing factor (Woodhouse 2006). The PRC's PPP issues are noteworthy. The government recently established formal regulatory institutions for many utilities, yet the country's planning ministry effectively retains final pricing authority over many infrastructure-related services.

Divestitures due to unfavorable outcomes are a manifestation of another ominous trend—a shortening in the implicit investment horizon for infrastructure, one of the external effects of past PPP experiences in Latin America and Asia. It would not be surprising to find that recent project analyses dwell as much on exit strategies as on investment. While PPP projects are originally conceived by governments with the assumption of a certain amount of stability in terms of investor composition, the opposite has in fact occurred, with many divestments and buyouts occurring long before the end of the first decade of operations. The frequency of hasty divestments reflects the rise in risk premia, which adds to the cost of subsequent PPP investments.

Part of the reason for all the underlying stress in East Asian PPP is the preference for new, uncertain, and perhaps prospective markets for infrastructure services. Future cash flows from some of these projects are tied to unrealistic expectations of future economic growth, which discounts economic crises and other shocks. Another possible reason for project stress is the fact that some of the projects have not been solicited by governments. These unsolicited projects, developed because of initiatives of private developers. Some of these projects, which suffer from inconsistencies with broader national infrastructure plans, have been purposefully pushed through legitimate channels of approval, but may, because of weak public institutional checks, lack the necessary financial and economic fundamentals to be viable. In the end, these projects may fail and ultimately seek fiscal support. Several countries in the Asian region, notably the Philippines, have experienced problems with projects that have resulted from unsolicited bids. **Figure 3 illustrates many (not necessarily all) of the risk factors that can affect project outcomes.**

**Figure 3: Outcomes of Projects: A Schematic Diagram**



The following sections highlight the main determinants of global PPP outcomes. The empirical section that follows will focus on estimating these determinants using proxy variables for these factors.

**Macroeconomic environment; openness of economy**

Figure 3 depicts project outcomes as driven by several factors, including macroeconomic conditions. Intuitively, macroeconomic conditions during the period the project *operates* should affect project outcomes. All other factors remaining constant, robust economic growth should lead to good project outcomes as demand for output rises, leading to healthy cash flows. In addition, PPPs are typically highly leveraged and dependent on foreign currency financing. By earning revenues in local currency, borrowing in foreign currency and incurring foreign currency-denominated capital expenditures, PPPs can be exposed to currency mismatches (along with maturity mismatches). Therefore, a devaluation of the local currency may lead to cash flow and debt-service problems during construction and operations. Devaluations during the 1997 Asian crisis severely affected the ability of many projects to service their debt. In the Philippines, Maynilad Water suffered from the burden of servicing foreign debt it had inherited from the government utility that had previously operated the concession. Partly due to the losses, the original owners of Maynilad were forced to sell their stakes back to government.<sup>5</sup> The macroeconomic environment in the country also has the potential to interact with other factors in the project’s periphery, such as the sentiments and forecasts of government and private project planners, with other undesirable effects on project outcomes (more on these later).

<sup>5</sup> On top of losses due to currency risks, Mendoza (2010) argues that intra-Lopez companies’ rent-seeking and poor Maynilad corporate governance also contributed to its eventual renationalization.

A country's openness to commerce with other countries may also have a positive effect on PPP outcomes. By intuition, open economies value infrastructure more than closed ones, because they should be more reliant on infrastructure for easing access to domestic supply routes and foreign markets. More open economies should also be more acquainted with large and/or foreign investors, and be more inclined to preserve good relations with them in the long-run.

### **Incentive issues – moral hazard and adverse selection in planning, design and contracting**

As mentioned earlier, macroeconomic conditions *during the period the project operates* should affect project outcomes. What is not intuitive is that macroeconomic conditions *before a project operates* – i.e., during project conception and planning - can affect project outcomes – if they give rise to incentive problems. For example, during periods of high economic growth, it is often observed that countries select the largest and most expensive projects to implement, though they may not necessarily be optimal. In addition, over-forecasts of demand by project planners are more likely to be committed when economic growth is high during the planning and design phases. In turn, over-forecasts of demand can lead to larger project costs and subsequent losses, especially during the first few years of operations (Flyvbjerg, B., N. Bruzelius and W. Rothengatter (2003), Flyvbjerg, B., M. Holm and S. Buhl (2002), Flyvbjerg, B., M. Holm and S. Buhl (2005), Mackie, P. and J. Preston (1998) and Mott MacDonald (2002)). High growth during planning and design can lead governments to be less thorough when screening projects and proponents. High growth periods may exacerbate adverse selection by attracting riskier projects and proponents to environments with less stringent controls and screening. Incentive problems can be compounded when the government provides government guarantees as a matter of policy. Macroeconomic conditions can also distort risk allocation in contracts – e.g., governments unable to see beyond the veil of fast growth agree to assume inordinate levels of risk.

Similarly, errors by project planners in exchange rate forecasts may be more likely to be committed when exchange rates are rigid or fixed during the design phase. Such errors manifest themselves in a failure by stakeholders to anticipate currency collapses (large discrete devaluations) that can occur during the operations phase—an indication of moral hazard running from macroeconomic conditions to contract design. Currency risk increases when the risk rises that a fixed exchange rate will devalue. This is not the case, however, if the exchange rate is fixed and may revalue or appreciate, such as in China. As mentioned earlier, appreciations are generally good for highly leveraged capital-intensive PPP projects.

The literature on government guarantees identifies a wide array of government fiscal supports. This can range from government shouldering demand risk, exchange rate risk (all contractually explicit) or other risks. Government guarantees may also significantly reduce incentives for stakeholders to conduct thorough due diligence in projects, raising moral hazard and adverse selection, leading to potentially large costly contingent liabilities, discussed in much of the earlier literature on PPP projects (Reside, 2001, Lewis and Mody, 1997).

Incentive problems can be exacerbated because government guarantees are typically not priced – they are freely given - the supply of guarantees and other government-assumed risks in PPP is not rationed by a pricing mechanism. This can give rise to situations in which the pattern of risk-allocation in a project (e.g., the contract) is itself a possible trigger for political risk. Large

Southeast Asian countries all had major difficulties with their independent power producers (IPPs) during and after the Asian crisis, due to government-guaranteed off-takes in power purchase agreements (PPAs). All renegotiations of IPP contracts in the wake of the Asian crisis were due to the fact that PPAs passed currency and fuel risks to state-owned utilities (This was not an undue decision in itself. In many cases, currency risks should be passed onto the state since it has best control over the risk. States simply have to manage risks better by pursuing appropriate macroeconomic policies and being more prudent in contracting.) The quality and transparency of contracting could also affect project outcomes. In one case, the Philippine government was compelled to cancel an international airport contract in 2002, due to perceptions that the signed contract was detrimental to the interests of the state.

### **Political risk and institutional factors**

Figure 3 also emphasizes the role played by political risk in project outcomes. A review of global PPP experiences conducted for this study suggests that opportunistic actions by government executives — political actions — are pervasive and can profoundly influence PPP outcomes. In developing countries, government executives may be responsible for most tariff decisions, or they make decisions on tariffs even in the presence of formal regulatory bodies. Since the range of possible actions is broad (ranging from tariff interventions to expropriations, to changes in investment rules, regulations, and legislation) a broad definition of political risk is needed to capture the impact of executive discretion on projects. **For this study, political risk is defined as the possibility that government executives may use their prerogative to make sweeping changes in investment rules or regulations—through measures such as protracted tariff freezing—that undermine a project’s market value.**<sup>6</sup>

While broad political risk can pose the biggest threat to project outcomes, it is usually only realized after other risks—such as currency or demand risks triggered by macroeconomic shocks—have materialized first. One possible channel through which adverse project outcomes can (and often do) evolve or materialize because of macroeconomic risk feeding into political risk is represented by the sequentially numbered boxes in Figure 3:

- 1) A macroeconomic crisis occurs, triggering a devaluation;
- 2) Depending on what the contract stipulates, currency risk is either borne by the project firm or by the consumers;
- 3) If it is borne by the firm, it bears the direct impact of currency risk; and
- 4) If it is borne by consumers, the country’s highest government officials freeze tariffs.

A good example of the sequence (1) – (3) being realized are power purchase agreements signed by Thailand with its IPPs prior to the Asian crisis. The devaluation of the Baht in 1997-1998 adversely affected IPPs, and the government agreed to partially assume currency risk. A broad array of infrastructure services in Argentina serves as an example of the sequence (1), (2) and (4). Tariffs were frozen across the board for many years after the collapse of the Argentina

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<sup>6</sup> Although laws are the domain of legislators, and not executives, we have labeled changes in law as political risk as well. In parliamentary political systems, the prime minister and cabinet members are legislators themselves. But even in presidential systems, chief executives have some decree or law-making powers and functions. They can also heavily influence law-making through pork barrel allocations and other means of patronage.



currency board in 2001. In the long-run, firms that are left to bear the direct impact of currency risk choose to renegotiate or divest, selling their stakes back to government or other investors.

There are many examples of macroeconomic shocks detrimental to PPPs in recent history. The first macroeconomic shock to privatized infrastructure was the Mexican crisis of 1994, which led to large disparities in forecast and actual traffic on privatized toll roads: a realization of demand risk. The government subsequently bailed out losing projects. This was followed by the Asian crisis, which saw the collapse of fixed exchange rates in the worst-hit countries. Overnight, countries that pursued privatization were faced with a political decision — who would bear the cost of currency risk (in addition to demand risk)? In many cases, the burden was shared: governments renegotiated contracts, while taxpayers and consumers of infrastructure services assumed parts of stranded costs. The shock from the Asian crisis reverberates to the present, with Malaysia persistently encouraging IPPs to renegotiate their contracts after the crisis started to weaken the financial position of the state-owned power utility, Tenaga. The terms of power purchase agreements have been viewed as overly favorable to IPPs. The government recently responded with creeping expropriation - a windfall tax on IPP profits was levied in early 2008. The government offered to mitigate this tax to any IPP willing to renegotiate their contract.

Recent major macroeconomic shocks to hit PPP investments were the collapse of the Brazilian *real* in 1999, the breakdown of the currency board in Argentina in 2002, and the banking-related currency collapse in the Dominican Republic in 2003. As with the Asian crisis, these triggered a discrete and simultaneous realization of currency and demand risks. These also triggered many renegotiations with private operators.

The manner in which governments in Asia and Latin America responded to these crises is a study in contrast. While Asia's response primarily consisted of contract renegotiations and partial nationalization or subsidization<sup>7</sup>, Latin America's primary responses consisted of tariff freezes (price controls) and subsequent renegotiations over time.<sup>8</sup> The latter was the response of the Argentine government, which froze all utility tariffs at the height of the peso crisis in 2002 (they remain somewhat rigid and low to this day, even with occasional adjustments).<sup>9</sup> In addition to imposing a tariff freeze, the government also suspended the indexation of tariffs to the US dollar, leading to the "pesofication" of tariffs. Since then, other governments in the region have used tariff freezes in response to economic shocks (e.g., Nicaragua, and the Dominican Republic after its banking sector-led shock in 2003). Firms cannot withstand a prolonged period of tariff rigidity. Many of the distressed or cancelled projects in Argentina, the Dominican Republic, and Nicaragua are energy projects which have been subjected to protracted tariff freezing. This implies that tariff freezes,<sup>10</sup> a manifestation of political risk, represent a significant ratcheting up of pressure. Table 9 provides a sample of recent tariff freezes.

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<sup>7</sup> The exception in Asia was Indonesia, which placed a cap on tariffs charged by IPPs during contract renegotiations. Pakistan also renegotiated IPP contracts in the late 1990s, but not because of the Asian crisis. The trigger was a change in government, which brought in officials who believed that IPP contracts negotiated under the previous regime were extremely disadvantageous to the state. Unlike the early experience with privatization and PPPs in Latin America, where renegotiation was often initiated by firms, the Asian experience has been dominated by government-initiated renegotiations. This is particularly true in the case of IPPs, which have experienced government-led renegotiations in Thailand, the Philippines, Indonesia, and Pakistan.

<sup>8</sup> There were a few exceptions in Asia, however. In Indonesia and Pakistan, government authorities set limits on tariffs after IPP contracts were renegotiated (effectively tariff freezes).

<sup>9</sup> The government also set up a special commission to renegotiate contracts.

<sup>10</sup> Also called creeping expropriation.

**Table 9: Examples of Recent Executive-Pronounced Tariff Freezes**

Country	Start Year	End Year	Sectors affected (Trigger)	Project
Argentina	2002	Present	All sectors (collapse of pegged exchange rate)	all projects
Bolivia	1999	Present	Water (public protest)	Aguas del Illimani SA
China, People's Republic of (PRC)	2006	Present	All sectors (general increase in commodities prices)	all projects
Dominican Republic (2 instances)	2000	2002	Energy (collapse of pegged exchange rate)	all energy projects
	2005	Present		
Indonesia	1997	2001	Water (collapse of pegged exchange rate)	Jakarta Water (Eastern District)
Indonesia	1997	2001	Water (collapse of pegged exchange rate)	Jakarta Water (Western District)
Nicaragua	2004	2005	Energy	all projects
Venezuela, RB	1999	Present	Telecom	all projects
Republic of Korea	2008	Present	Energy (general increase in commodities prices)	All projects

Source: Author's estimate using a survey of news reports from around the world. If no news about the lifting of a tariff freeze has been found, the end year is stated as "present".

Many of the projects listed as "distressed" or "cancelled" in the World Bank's PPI database are in the sectors and countries listed in Table 3. Sweeping tariff freezes instigated by national executives in response to substantial currency risk are most significantly associated with PPP project cancellations and distress. Tariff-freezing can also occur when there is a persistent shock to prices, such as the recent increase in global commodities prices. This risk is greater if the country pursues strict inflation targeting (as in the case of the Republic of Korea) or if government executives themselves are highly averse to inflation (as in the case of China).

Protracted tariff rigidity is characteristic of markets where the government routinely intervenes in price control. In China, such controls are pervasive.<sup>11</sup> For example, many early projects in water and wastewater treatment in China failed. Because of the localized nature of water projects, tariff approvals for water in the China pass through local politicians. Proposals for tariff changes thus become more sensitive after changes in local leadership. The problem is further aggravated when the required rate or level of wastewater treatment is high (and therefore the cost of water treatment to the firm is high, but the rigid tariff allows little or no cost recovery). Due to these and other factors, the timing and extent of net revenues tend to be uncertain. Furthermore, municipal guarantees on prices are prohibited under the law.

Developing countries are prone to political risk, because government executives can make tariff decisions even with formal regulatory bodies in place. The risk of this is heightened

<sup>11</sup> These controls are also the dominant reason for PPP failure in the PRC.

during crises or some other political events. In countries such as Indonesia (after the Asian crisis) and Pakistan (after a change in government), government authorities set limits on tariffs after IPP contracts were renegotiated.<sup>12</sup> There can be other motivations for tariff freezing, such as persistent price shocks in an inflation-averse environment. Since any increase in utility tariffs feeds into the general price level, the risk of tariff freezing rises when there is a sudden, large devaluation. Tariff-freezing can also occur when there is a persistent shock to commodities prices.

The extent to which citizens participate in conception, design and planning of projects may affect political risk. If a project truly reflects demand for infrastructure, cash flows will be more sustainable and it will be more insulated from adverse discretionary or opportunistic actions by government. In some cases, project design may not be done through consultation, and is railroaded through the approval process, leading to disastrous consequences. The failed water concession in Cochabamba, Bolivia is an example. That concession, approved by government in 2000, was widely opposed by farmers, unions and consumers over fears that the cost of water for irrigation along with water from existing networks that would be connected into the privatized system would rise. These fears would be realized as the cost of water spiked, triggering violent protests. The project was scuttled (Shultz, 2005).

Political risk can also come down to bear on PPP operations if the output of a project is sold in retail (downstream, end-user) markets, because retail customers comprise the bulk of a country's population. Downstream projects can be subjected tremendous political (and regulatory) risk. This could be the case in power distribution and water utilities. Mid-stream sectors, such as power transmission sector, may also face political risk, if they sell electricity to many smaller distribution utilities. In addition, they can bear the credit risk of these utilities. A project could be more insulated from political risk if it sells output to a small number of buyers in wholesale markets—examples include bulk water contracts as well as IPPs. In addition, in most cases, unit selling prices at the upstream level are negotiated with government executives.

Given that political risk is so pervasive, there must be a premium on a company's ability to mitigate and adapt to it, which may include knowledge of local customs, practices, familiarity with local culture and behavior. This may confer some advantages on domestic over foreign proponents. The possibility that foreign investors are disadvantaged will be empirically tested below. In addition, purchasing political risk guarantees from institutions that specialize in such products may also be of help. Political risk guarantees insure firms against losses arising from actions undertaken by host governments such as expropriation, wars, etc.

### **Fiscal capacity of government**

The government's fiscal capacity refers to the ability of the government to finance public infrastructure and/or support projects. Adequate fiscal space allows government to be more discriminating with respect to accommodating PPP projects. It does not have to privatize many infrastructure projects (or approve many projects) that are inherently risky. On the other hand, countries with large fiscal deficits are more likely to approve a large number of risky

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<sup>12</sup> Protracted tariff rigidity, however, can be short-sighted, because it increases the risk of supply shortages. The countries cited above suffered from power shortages because of inadequate investment in affected sectors.

infrastructure PPP projects because tight public financing constraints for public projects prevents the government from satisfying naturally growing demand for infrastructure. Sufficient fiscal space also enables support for a greater number of projects, projects with larger scope and a larger portfolio of projects in general. This support may enable projects to absorb shocks during crises. Size of the government's fiscal space should be correlated with levels of government debt, persistence of public deficits, and the size of the government's PPP portfolio. The size of a government's PPP portfolio may also have an effect on project outcomes. If a systemic macroeconomic shock occurs, such as the Asian crisis, the fiscal burden of supporting many affected projects may take its toll on individual projects, as fiscal support available per project may have to be reduced.

Macroeconomic conditions can also lower fiscal space and raise fiscal risk, as recessions or other slowdowns in real economic activity can simultaneously lower tax collection and increase the probability that projects will seek fiscal support, regardless of whether the government provides explicit guarantees or not. Macroeconomic conditions can also affect the capacity of government and state-owned enterprises to bear some risks, especially fiscal risk. PPAs signed by state-owned utilities with IPPs featured agreements for guaranteed off-takes but severe economic downturns led to a drastic deterioration in the utilities' financial positions (by causing the credit risk of the off-taker to decline). With national fiscal balances under severe threat in both countries as a result (with potentially large debt and contingent liability implications), the governments of Indonesia and the Philippines decided to renegotiate the PPAs in 2002 and 2003, respectively.

### **Other reasons - regulation, credit risk of buyers**

Figure 3 also highlights the role conventional regulatory risk plays in determining project outcomes. Regulatory risk covers the possibility that regulators may impose on private sector proponents inadequate tariffs, excessively harsh conditions on service, capacity, and others. This study tests whether the presence of an independent regulator in the industry improves project outcomes. This study also tests the impact of regulation by method – rate-of-return (ROR) or price-cap methods. The latter imposes stronger requirements on proponents for attainment of efficiency and is thus a stronger incentive.

## **V. Structural model specification, estimation results and interpretation**

### ***Model Specification***

The econometric specification of the model is simple. All of the factors cited above and in previous sections may impair the firm's value. Given the often complicated evolution of and relationships between risks and project outcomes, a structural econometric model is therefore appropriate for this study:

**Project outcomes (fail or not fail) = f(various endogenous and exogenous factors),  
with endogenous variables a function of instruments.**

The model lends itself to probit, logit, multinomial and ordered discrete dependent variable regression techniques.

## **Data Description**

The variables used in regressions are described in Appendix A. There are generally two types of data required to estimate the model. The first type of data is project-specific data available from the PPI database of the World Bank. Other data are required to allow one to estimate various risks that affect a broader set of projects over time.

Since the PPI dataset is cross-sectional, the project information in it is limited to project-specific data at the time the contract was signed, such as the value of the investment commitment, the sector, and the identity of multilateral creditors. However, for each cancelled or concluded project, the year of financial closure and year of cancellation or conclusion are also listed. For projects that are currently operational, macroeconomic conditions during the last few years of operations can be captured. Thus, for each and every project in the PPI dataset, it is possible to capture economic conditions prevailing during the project design and operations phases. This allows one to get a sense of how macro conditions affect stakeholder psychology, in the sense that forecasts are affected by such conditions.

Explaining the wide variety of project risks described above empirically is difficult for a number of reasons. First, it is impossible to find global, project-specific data for a broad category of risks. Information related to demand risk or currency risk is not available from the PPI dataset or any other source. Second, the extent of these risks is directly proportional to assumptions and forecasts made by stakeholders during the time of contracting. However, data on these assumptions and forecasts are simply not available on a global scale as well.

In the absence of global, project-specific data, one must rely on creativity and use available data as proxies to capture the impact of these risks. Globally observable macroeconomic data can give one a sense of economic conditions prevalent in two key periods of the project cycle—the project’s design phase, and the project’s operations phase. It is highly possible that the macroeconomic environment prevailing during the former period influences stakeholder forecasts of growth and exchange rates during the latter period, and this is part of what this study aims to capture.

All regressions were estimated using a two-step probit procedure with endogenous regressors. Tariff freezing, as well as average per capita GDP growth prior to termination or the current period were treated as endogenous variables based on the fact that tariff freezes are often the outcomes of macroeconomic crises. On the other hand, it is reasonable to assume that current period growth is determined endogenously by a myriad of economic factors in the regression equations. This variable serves as a proxy for economic conditions during the project design and planning phase – a time when, as suggested earlier, incentive problems could be high if economic growth prompts project planners and designers to be haphazard.

The dependent variable in all regressions was whether the project was cancelled or not (a project failure). The significant regressors in the baseline equation included the endogenous

variables as well as predetermined variables – openness of the economy, real per capita GDP growth 6 years prior to project financial closure, and average standard deviation of the exchange rate 6 years prior to termination or the current period. The variability of the exchange rate during the operations period of the project is included as a proxy for macroeconomic stability.

### *Interpretation of Results*

Details of the estimation results performed are listed in Appendix B. A summary of the empirical results is listed in Table 10.

**Table 10: Summary of Effects of Various Variables on PPP Outcomes in the East Asia Region**

<b>Raises failure rate</b>	<b>Reason</b>	<b>Reduces failure rate</b>	<b>Reason</b>
<b>Tariff freezing episode in project life</b>	Tariff adversely affects revenues	<b>Average per capita GDP growth 6 years prior to termination or current period</b>	Growth reduces operating risks
<b>Standard deviation of real exchange rate prior to cancellation or termination of project or current period</b>	Macroeconomic volatility and uncertainty increases rate of project failure	<b>Standard deviation of real exchange rate prior to project closure</b>	Moral hazard of rigid and exchange rates – encourages stakeholders to discount currency risk
<b>Average real per capita GDP growth 6 years prior to financial closure</b>	Moral hazard in high growth environment	<b>Openness</b>	Open societies and economies are better able to sustain large private investments
<b>System of government closer to parliamentary than presidential</b>	Presidential systems have more checks and balances and veto players compared to parliamentary systems where executive and legislative powers and functions are merged. For this reason, it is reasonable to expect less tariff freezing in presidential systems.	<b>Contracted with federal government</b>	Federal government is superior to local government in planning, coordinating and helping to implement PPP
<b>Loan was provided by multilateral financial institution</b>	Participation of multilaterals have not helped projects	<b>Extent of foreign direct investment</b>	Foreign technologies and capital are good for PPPs in Asia
<b>BOT basis</b>	Chosen private	<b>Extent of checks</b>	Greater checks and

	proponents could improve; building new capacity is inherently risky	<b>and balances in government</b>	balances strengthen project design, planning and implementation
<b>Countries where fraud or candidate intimidation was serious enough to affect the outcome of elections</b>	Governments that commit fraud do not design and plan good PPP projects	<b>The longer the time a chief executive is in office prior to cancellation or failure</b>	More stable regimes do better at designing, planning and implementing PPP projects
<b>Power distribution</b>	Upstream sector is risky and subject to price regulation and more politicization	<b>Power generation</b>	Downstream sector for power is less risky and not as politicized as upstream sector; also prices are not regulated
<b>Government assumes risks/guarantee</b>	Moral hazard leads to poorer project design and implementation	<b>Electricity sector</b>	Region is generally hospitable to PPP in this sector because it is essential for production and sustaining country competitiveness
		<b>Rate of return regulation</b>	Price cap regulation imposes strong binding constraints on projects
		<b>Greater the extent of private ownership</b>	Shields the project from political risk as well as inefficient political decision-making by insiders
		<b>Average real exchange rate 6 years prior to termination or current period</b>	Real appreciation reduces debt servicing costs
		<b>Foreign direct investment</b>	Contribution of foreign technologies and capital improves outcomes

The regression results are consistent with several of the hypotheses discussed earlier. Tariff freezes, low economic growth and macroeconomic volatility during the operations period can fatally affect projects. Meanwhile, economic conditions during the project's planning and

design phases, such as high real economic growth could lead to moral hazard, adverse selection, and inferior outcomes.

### **Factors which raise the failure rate**

Factors that raise the project failure rate validate some of the hypotheses discussed earlier. That tariff freezes more often lead to failure is an expected result. This validates the role played by macroeconomic factors and subsequently by political risk highlighted earlier. Higher average real per capita GDP growth 6 years prior to financial closure validates the earlier hypothesis that high growth periods result in moral hazard. Governments tend to select more unviable projects as well as decide in a more haphazard manner (with respect to project approvals, guarantees, risks assumed, etc.) when there is an *ex ante* perception or expectation of high future growth. Moral hazard also may be responsible for raising project failures when government assumes risks and guarantees in projects. The presence of a risk- or loss-absorber of last resort (the government) may lead to inferior project planning, design and execution. That projects structured as build-operate-transfer (BOT) are more failure-prone is also an expected result. Projects catering to newer markets are more exposed to demand uncertainty and are also more vulnerable to shocks. This also suggests that projects where operations are simply turned over to private proponents, such as concessions, would be safer project structures. Macroeconomic volatility – as proxied by exchange rate volatility – also leads to greater failure.

Perhaps the most disconcerting result is the empirical result that PPPs financed by multilateral financial institutions have led not to lower, but higher rates of failure. Woodhouse (2005) and Wells and Gleason (1995) suggest that private investors, particularly foreigners, often try to deter governments from making adverse decisions by involving prominent entities as investors – this includes multilateral development institutions. This strategy may be manifested in co-investment (i.e., equity) by a multilateral lending institution or lending by international development banks, either directly or as guarantees for commercial loans. The empirical results suggest that either the projects themselves have failed on their own lack of merit or that Asian governments have not been dissuaded from canceling projects where multilateral development institutions are participants. Either way, this suggests that investors partnering with multilateral development institutions have achieved limited success in PPP in Asia. Woodhouse (2005) suggests that multilaterals typically pay greater attention to their broader relationships with sovereign governments than they may to particular projects.

### **Factors which lower the failure rate**

Many of the factors that lower the failure rate are also consistent with hypotheses discussed earlier. That higher average per capita GDP growth 6 years prior to termination or current period is very intuitive. Strong economic growth helps projects as they operate (as opposed to when they are planned). Rigid exchange rates prior to project closure – during the planning and design stages—lead to moral hazard and adverse selection and inferior outcomes as stakeholders discount currency risk more. Thus, projects designed in environments with more flexible exchange rates tend to fail less. More open economies (open to foreign investment) are also more able to properly leverage foreign capital and expertise in projects. The electricity sector, and more so the upstream power generation sector is associated with lower failure



because of the inherent necessity of power for sustaining growth, industry and competitiveness in Asia. Note however, that transport PPPs, telecoms and water projects neither significantly raise nor lower project failure in Asia. This may be because many of these projects are directly downstream in nature (providing services more directly to retail end-users) – for telecoms and transport, and are therefore subject to more political risk, or are inherently in more politically sensitive sectors (water). Rate of return regulation lowers the failure rate. This suggests that more flexible regulatory regimes lead to better project outcomes. Lastly, the greater the extent of private sector ownership in the project, the better the outcomes. Keeping public stakes in projects intact can expose the project to greater political risk and inefficient decision-making by insiders. That foreign direct investment (FDI) in Asian PPPs lowers risk suggests that Asian countries are well able to utilize the benefits of FDI for infrastructure – being more capable of absorbing foreign technologies and capital as a result of being more open. Real exchange rate appreciations also improve project outcomes – foreign debt servicing for such highly leveraged activities, as well as imports of capital inputs become less burdensome.

That the extent of private sector ownership in projects lower project failure rates suggests that private management is superior to public management. This is consistent with studies that suggest that privatization enhances efficiency in service delivery (D’Souza and Megginson, 1999).

### **Political factors which raise the failure rate**

*Project failure is more apparent in parliamentary systems than in presidential systems and in countries where fraud and candidate intimidation affected electoral outcomes.*

How would political factors adversely affect projects? The fusion of executive and legislative powers in parliamentary systems effectively reduces the number of veto players in a political system<sup>13</sup> and makes for more decisive policy-making, creating a tendency inherent in parliamentary systems to change policy more readily than presidential systems, which threatens project viability. As the number of veto players is reduced, the transactions cost for making decisions that affect projects is also reduced. For example, in response to macroeconomic shocks, policymakers in parliamentary systems may find it easier to freeze tariffs or change investment rules all of which could lead to project failure. The risk of policy volatility is higher under parliamentary rather than presidential systems. Moreover, a smaller number of veto players mean that if the prime minister or his cabinet has changed the investment rules or tariffs once, they could repeat doing so during the project’s life span. In contrast, a greater number of veto players favors the maintenance of the status quo.

Policy decisiveness is most pronounced in Westminster parliamentary systems (where the prime minister ensures that an absolute pro-government majority exists in parliament) and in dominant party systems. This is also true in authoritarian polities with standing parliaments as in China, Vietnam, Laos, and Myanmar. In these polities, parliaments are constituted not through freely-contested elections but by the ruling party. Thus, in a sense, these parliamentary systems have a single veto player. Coalition governments in parliamentary systems may prove to be

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<sup>13</sup> Veto players are individual or collective decision makers whose assent is required for a change in the status quo.

equally inhospitable to policy change as divided presidential governments given a greater number of veto players.

Policy decisiveness can lead to good outcomes and stable investor environments in some cases where the government presents a united front in support of business and investment development (e.g. Japan’s Liberal Democratic Party and Singapore’s People’s Action Party). However, having very few veto players can also lead to policy volatility. Experience confirms what our empirical work suggests - that policy volatility can be correlated with economic volatility, such as when economic crises occur. Some of the failures in the East Asian region appear to be the result of governments with few veto players intent on addressing crisis-triggered social and political fragilities through actions which undermined project viability.

Table 11 below lists countries in the sample ranked by the number of project failures. As a large country, China was expected to have the greatest share of projects and greatest number of failures. The following table however, lists countries ranked by failure rate—or the percentage share of total project failures in East Asia.

**Table 11: Number of project failures by country**

Country	No. of project failures	% share of total project failures
China	36	55.4%
Indonesia	11	16.9%
Malaysia	7	10.8%
Philippines	5	7.7%
Thailand	3	4.6%
Vietnam	1	1.5%
Laos	1	1.5%
Vanuatu	1	1.5%

Source: World Bank PPI dataset

**Table 12: Failure rate by country and local government-related failures**

Country	Number of projects	No. of project failures	Failure rate	% of total project failures	Of which: contracted with local government	% of total project failures
Indonesia	83	11	13.25%	16.90%	0	0.00%
Laos	8	1	12.50%	1.50%	0	0.00%
Malaysia	104	7	6.73%	10.80%	1	14.29%
Philippines	84	5	5.95%	7.70%	0	0.00%
Vietnam	17	1	5.88%	1.50%	0	0.00%
China	727	36	4.95%	55.40%	22	61.11%
Thailand	100	3	3.00%	4.60%	2	66.67%
	Total	64		Total	25	39.06%

Source: World Bank PPI dataset

Among the countries in the sample, Indonesia has had the greatest ratio of failure to number of projects. While many of the project failures occurred after the fall of the Suharto regime, a large proportion of the failures can be attributed to the succeeding Habibie government in their search for an appropriate balance between democratization and social protection after the Asian crisis and the fall of the Suharto regime. In 1996, four foreign-funded telecom operators won 15-year revenue-sharing deals with state-run PT Telkom, then under the Suharto government. These deals required these operators to install 2 million new fixed telephone lines in their respective service areas (mostly in the less developed areas of the country) from 1996-1999. The deals also specified that PT Telkom would allocate its employees and facilities for exclusive use of the operator. In turn, the operators would manage operations and have financial control over the service area. However, subscribers settled their bills with PT Telkom – the state-run firm would then transfer the revenues to operator accounts.

The Asian financial crisis, however, triggered a rash of bickering between the operators and PT Telkom. The firms argued over service accomplishments, management, and operational issues. Both government executives and legislators backed a temporary takeover by PT Telekom of operations in service areas under the operators because the latter refused to pay salaries. During the crisis, the operators bore the brunt of much of the currency risk – revenues were denominated in *rupiah* even if expenditures were denominated in dollars. There were also few tariff adjustments. To compound the risk for operators, legislators passed a law ending PT Telekom's monopoly on local and domestic long distance calls in 2002-2003. This would clearly benefit subscribers in less developed regions, but any potential competitor to PT Telekom would be free to eat into PT Telekom's subscriber base, further pressuring operator revenues. The events demonstrate that government and the PPP-sponsoring agency, working in concert during a period of political and economic consolidation, with few veto players, can lead to investment instability. Nevertheless, Indonesia has made strides in recent years. The democratization process was completed in 2004 when the president, Susilo Bambang Yudhoyono (SBY) was directly elected by the people instead of being chosen by parliament as before. Presiding over an 8-party coalition government, SBY experienced a single project failure during his first term.

Next to Indonesia, Malaysia has the next highest ratio of failure to number of projects. Like Indonesia, the economic and political fallout from the Asian financial crisis has also undermined several projects in Malaysia. Similar to Indonesia during the Suharto regime, Malaysia has had experience with very few veto players in government. Malaysia has a dominant-party alliance parliamentary system as the *Barisan Nasional* has held power since independence. While the vast majority of *Barisan* seats are held by its three largest race-based parties—United Malays National Organization (UMNO), Malaysian Chinese Association (MCA), and the Malaysian Indian Congress (MIC)—UMNO clearly enjoys 'first-among-unequals' status. For this reason, the UMNO head is always Malaysia's prime minister. With few veto players during the 1990s, a period where many of the existing projects were developed, screened and contracted, the structure and policies of the Malaysian government have always had profound effects on subsequent PPP-related actions by government. Several of the failed PPP in Malaysia, such as telecoms and urban rail projects, consisted of contracts cancelled and subsequent financial rescues by government. Some of the projects were not very well managed, contributing to their financial problems during the Asian crisis, suggesting the private proponents

may not have been screened very well. Other failures consisted of water utilities - supply and sewerage investments. These suffered from typical tariff sustainability issues.

The interplay between political factors and unique features of PPP transactions can also yield outcomes in PPP that are not seen in other sectors of private investment. Given the large scale, visibility and potential social impacts of PPP projects, the tendency exists for governments where veto players are confined to a few or one highly prominent personality - to negotiate such deals on the basis of consolidating and strengthening their political and social stature around (a) symbolic or “flagship” project(s). In effect, the veto players exercise political “ownership” over the PPP transaction they broker. However, such transactions are subject to heightened political risk as well because if there is a change of leadership that alters the make-up of principals that originally brokered the project, there can be change in political sentiment towards the project. Also because there may be a personal attachment felt towards the project, rescuing it financially if it is adversely affected by a crisis may be more likely.

The likelihood that a change in political leadership alters political support for a project depends on the perception that the project development process is tainted by corruption, lack of transparency, cronyism and nepotism. In turn, the likelihood that all these issues beset a particular transaction increases the fewer are the veto players in the government. Examples of changes in government adversely affecting political support for PPPs, leading to cancelled contracts and other actions undermining projects include power projects in Indonesia and an NAIA 3 airport terminal project in the Philippines (see below). Where there are insufficient checks and balances, as well as insufficient transparency and number of veto players, contracts directly negotiated with the government (instead of bid out competitively) are prone to problems sooner or later down the line. Potential triggers for reversals include changes in government, challenges to political authority, abrupt confidence crises and government credibility challenges, and economic crises.

The NAIA 3 airport terminal in the Philippines is an excellent case of how contracts negotiated in an environment with very little checks and balances can easily suffer consequences later on. NAIA Terminal 3 was approved for construction in 1997 and was originally scheduled to open in 2002. However, a legal dispute between the government of the Philippines and the project's main contractor, Philippine International Air Terminals Co. Inc. (PIATCO), over the Build-Operate-Transfer (BOT) contract, delayed the final completion and opening of the terminal. In 2003, the Philippine President declared the contract “onerous”. Subsequently, the Philippine Supreme Court nullified the franchise of the main contractor to the airport, on the grounds that contract negotiation had been tainted by anomalies. The Supreme Court upheld the Philippine government's position for, among other things, violations of certain provisions of the BOT law. Specifically, the Court found that the original contract was revised to allow for a Philippine Government guarantee of PIATCO's obligations to its creditors, contractors and suppliers. The BOT law disallows the granting of such sovereign guarantees. In December 2006, the Philippine Government expropriated the terminal project from PIATCO through an order of the Pasay City Regional Trial Court (RTC) (Calica and Romero, 2006). PIATCO (and its German partner Fraport) have instituted arbitration proceedings before different international bodies (PIATCO in Singapore before the International Chamber of Commerce, (ICC) and Fraport in Washington D.C. before the International Centre for Settlement of Investment

Disputes (ICSID)) to recover a fair settlement. The case filed in Washington was decided in favor of the Philippine Government while the case in Singapore continues to be under litigation.

The likelihood that a particular project will be publicly rescued during an economic crisis – a rescue effectively cancels the contract and nationalizes the project - is positively correlated with the personal affinity felt by a nation's leader(s) for the project. This affinity is in turn dependent on the extent of the leader(s) personal participation in project development as well as the perception by the leader of the extent of social benefits from the project. Several projects in Malaysia benefitted from public support in light of the effects of the Asian financial crisis. There were perceptions that these projects were developed in close coordination with the nation's leaders at that time.

Political actions by governments do not necessarily lead to project failures, but nevertheless can lead to project stress. Successive Malaysian governments have experienced varying levels of political challenges from the opposition, with a concomitant increase in the number of veto players. This has led to some stress on the Malaysian IPP sector, a sector whose investors have previously been insulated from discretionary pronouncements by government and the political process in Malaysia. Although the power sector in Malaysia has been relatively insulated from the highly adverse consequences of the Asian crisis, the government has been trying to pressure independent power producers (IPPs) to renegotiate their contracts, with features such as guaranteed off-takes often viewed as detrimental to the financial health of Tenaga, the state-owned power utility. The government levied a windfall tax on IPP profits in early 2008 in a bid to recover enhance state revenues and correct perceptions of "undue" financial gains by IPPs (Boston Globe, 2008). This populist move may be interpreted as one of the ruling alliance's response to the steady increase of opposition parliamentary seats in recent elections. This again demonstrates that government and the PPP-sponsoring agency, working in concert during a period of political and economic consolidation, with few veto players, can lead to investment instability.

The People's Republic of China (PRC) accounts for more than half (or 55.4%) of the 65 cancelled PPP projects in Asia. In contrast, Thailand accounts for 4.6% of the total cancelled projects. The stark contrast in outcomes may be explained by the greater number of veto players in Thailand compared to China. Since 1993, Thailand has had about eleven (11) prime ministers, with one ousted by a military coup in 2006. Some of them had terms as short as a month while a few of them resigned or were unseated due to corruption charges. In spite of the seeming instability in government, Thai project outcomes appear to be superior to those of other countries. What is common to most Thai prime ministers is a multi-party coalition government with at least five partners.

China has single veto players both at the local and national governmental levels. Most of the PPP failures are at the local level (see Table 12 above). Competing to attract FDI, local executives approved many infrastructure PPPs without central government oversight and project outcomes were subsequently adversely affected by changes in local leadership or executive discretion. Choi et al (2009) cite the case of the Da Chang Wholly Foreign Owned Enterprise (WFOE) BOT water project, the first PPP water project in Shanghai, negotiated by the government with the Thames Water and Bovis consortium in 1995. The project built a water

treatment plant with a capacity of filtering 400,000 cubic meters per day for two million customers and to operate the plant for 20 years. The project was initially regarded as a successful case in that the municipal government independently proceeded with the project without any symbolic support from the central government, such as comfort letters or guarantees, so as to limit the financial risks involved. However during the operations phase in 2002, a policy reversal occurred – the Chinese State Council declared guaranteed rates of return for infrastructure projects illegal. Moreover, guaranteed rates of return in BOT projects would have to be shared by foreign partners with their Chinese counterparts. Despite efforts by Thames Water to negotiate the new terms with the Shanghai Waterworks Company (owned by the Shanghai government), the company could not reach any agreement and finally exited the project by selling its assets to the Shanghai Shibe (Northern City) Water Treatment Corporation in June 2004.

In countries where fraud or candidate intimidation is serious enough to affect electoral outcomes, the incumbent government has an uncertain mandate and could face significant challenges from dissatisfied political rivals. In conjunction with macroeconomic shocks, increased political instability could adversely affect project outcomes. Economic and political crisis could mutually reinforce each other. Incumbents may be tempted to freeze tariffs (implement price controls) to broaden their political support and undermine their challengers.

### **Political factors which lower failure rates**

- 1) Contracted with federal government**
- 2) Extent of checks and balances in government**
- 3) The longer the time a chief executive is in office prior to cancellation or failure**

The political factors that lower project failure rates includes the extent of checks and balances in government, the extent of private sector ownership, the length of the chief executive's tenure in office (prior to cancellation or failure), and whether the project is contracted with the federal/central or local governments.

The level of checks and balances in government is related to the notion of veto players discussed in the preceding section. A reduction in checks and balances means a lower number of veto players in any transaction. A lower number of checks and balances can lead to arbitrariness in policies since only one (or a few) make political (or policy) decisions. Fewer veto players may produce decisiveness and policy flexibility (at its best) but also policy volatility at its worst (Tsebelis 1995, 1999, 2000). An empirical study by Henisz (2004) concludes that political checks and balances which constrain decision makers' discretion serve to limit policy volatility and thus encourage investment and economic growth. A fewer number of veto players may also lead to a larger number of project approvals and could also mean relaxation of due diligence. When these projects are affected by macroeconomic shocks and other sources of project risk, it is again less difficult for a fewer number of decision makers to freeze tariffs, seek contract renegotiation, or change investment rules. In addition, a greater level checks and balances generally enhances the commitment (makes it more credible) of governments to honor contracts.

As a rule, federal/central governments have longer project experience, greater technical competence, and greater capacity to absorb shared project risks compared to local governments. They also pay higher wages and thus attract more competent bureaucrats. For this reason, projects contracted with the federal/central government have lower failure rates than projects contracted with local governments. This is most apparent in China, with many failures at the local level (see Table 12).

The longer a chief executive is in office means that he (whether president or prime minister) is evaluated positively by all concerned political stakeholders. A long tenure is associated with political stability which in turn has beneficial effects on project outcomes. However, the longer the chief executive's political party is in power does not necessarily lead to the same outcomes. The more years a chief executive's party is in power may not necessarily bring about political stability if the ruling party is rocked by intramurals or if the electoral mandate of the chief executive is contested (as in the case of Philippines' Gloria Macapagal-Arroyo). So even if a country has the same ruling party over a period of time, it may have to endure transitions from one chief executive to another over the same stretch. These transitions may have adverse effects on project outcomes.

### **Does the quality of governance determine PPP investment outcome?**

While the quality of country governance as measured by the World Bank Governance Indicators can influence the pattern of PPP investment flows,<sup>14</sup> this did not directly explain favorable PPP investment outcomes in the main empirical model. Interestingly enough, many of the stressed projects were located in countries with relatively high scores in governance criteria. When the World Bank's governance indicators were individually entered into second stage probit regressions, they yielded insignificant coefficients or coefficients with perverse signs (i.e., they raised failure rates). The positive correlation between good governance criteria—government effectiveness, control of corruption, political stability and rule of law—and stress in PPP implies that a vastly different governance paradigm for PPP should be contemplated. Good governance in PPP includes having good macroeconomic policies to prevent shocks that may lead to adverse political decisions. This suggests that the World Bank governance indicators themselves may be inadequate given that they are subjective measures of perceptions. More objective measures—such as number of veto players and whether their policy preferences are aligned with each other—may thus yield superior outcomes.

Nevertheless, governance indicators play an important role as instruments for the other endogenous variables in the empirical model. Of particular interest is the role governance plays in tariff freezes. Typical first stage regressions for the tariff freeze variable (TARIFFRZ2) yielded results consistent with the incidence of tariff freezing being positively related to poorer governance scores by World Bank standards. The results suggest that the probability of a tariff freeze is greater: (i) the lower the extent to which a nation's citizens can select their government, and enjoy freedom of association, the press, etc. (VOICE); (ii) the more vigorous the enforcement of rule of law; and (c) the greater the extent of corruption (CORRUPT). Other governance indicators such as REGQUAL (regulatory quality) and GOVEFF (government effectiveness) tended to perform perversely in the first and second stage regressions.

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<sup>14</sup> Per the World Bank's governance criteria, well-governed countries tend to attract a lot of PPP investments.

A lower VOICE score means that a government is authoritarian and that checks and balances are not vigorous. For this reason, a low voice score will be associated with a greater probability of a tariff freeze. Meanwhile, a higher CORRUPT score will be associated with a greater probability of a tariff freeze. Jurisdictions with lower levels of corruption are less likely to freeze tariffs while countries with higher levels of corruption will be more likely to freeze tariffs. The freezing of tariffs is, among others, an opportunity for state agents to extract side payments from private contractors. More corrupt agents are then most likely to freeze tariffs in expectation of illicit gain that could arise from tariff unfreezing or contract renegotiation.

However, the association of a higher rule of law (RL), regulatory quality, and government efficiency scores with a greater probability of a tariff freeze is puzzling and perverse. Kaufmann et al (2009) defines ‘*Rule of Law (RL)*’ as “capturing perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence”; *Government Effectiveness (GE)* as “capturing perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government’s commitment to such policies”; and *Regulatory Quality (RQ)* as “capturing perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development.” Intuitively, one should expect that countries with enhanced RL will be less likely to freeze tariffs since the quality of contract enforcement would be high. The same will be true for countries with enhanced RQ and GE scores.

## **VI. Policy implications and recommendations**

This study has identified the major risks affecting global PPPs into six major factors:

- 1) Macroeconomic environment; openness of economy
- 2) Incentive issues during planning, design and contracting phases
- 3) Political risk
- 4) Fiscal capacity of government
- 5) Firm-embodied traits: level of technical efficiency and capacity of proponents in construction and operations
- 6) Other reasons - regulation, credit risk of buyers

Good macro-prudential policies underpin successful PPP programs. The term “macro” applies to economic policies throughout the project cycle, while “prudential” refers to how public and private managers manage risk and incentives given the economic environment. Intuitively, economic conditions during the operations phase are key determinants of outcomes – macro-prudential policies coupled with robust economic growth improves demand, improves the credit risk of buyers and reduces the likelihood of economic crises followed by tariff freezing or other forms of opportunistic behavior or realization of political risk by governments. Opportunistic behavior and political risk can also be mitigated by ensuring sufficient checks and balances, transparency, and consultation throughout the project cycle.



Economic conditions during the design and planning phases can lead to incentive problems. While high growth is always desirable, great care must be taken during planning and design to ensure that project scale, as well as the number of projects selected and fiscal supports are manageable. Demand forecasts are tempered by the fact that the project horizon for infrastructure is very long so growth cannot always be relied upon to be consistently strong.

Fixed exchange rates can increase currency risk for PPPs when the possibility of a large devaluation exists. The collapse and devaluation of a pegged currency is higher the more inconsistent monetary and fiscal policies are with each other. Therefore, where devaluation risk exists, PPPs are best undertaken where government has sufficient fiscal space and where customers are accustomed to factoring exchange rate fluctuations into their economic decisions. Regardless of economic conditions, project planners should always subject projects to stress tests – for large declines in economic growth and for devaluations. This is not to say, however that fixed exchange rate regimes are sub-optimal environments for PPPs. To the extent that the risk of a pegged exchange rate is to revalue, rather than devalue, PPP outcomes will not necessarily be compromised. Also, countries with large pools of private savings should strive to channel these into projects, in order to mitigate currency risk. Thus, countries should strive to develop long-term domestic debt currency markets for PPP and other purposes. With large current account surpluses, high private savings rates, and potentially strengthening currencies, many Asian countries appear ready to further support PPPs.

Sufficient fiscal space means avoiding running persistent and large fiscal deficits and remaining liquid. This allows countries to cushion the impact of systemic crises on projects (so that the available per unit fiscal support is adequate and absorbable). It also enables the government to select and design projects on the basis of objective criteria, without placing undue demand on PPPs to supply infrastructure because binding fiscal constraints squeeze the supply of public infrastructure.

Given the impact of government guarantees on incentives, contracts, and outcomes, great care must be taken to mitigate moral hazard and adverse selection in projects with government guarantees, as this can lead to large and uncertain contingent liabilities which can destabilize government budgets. This means having sufficient checks and balances, consultation in planning and transparency in the provision of government guarantees. Strategies must be found to ration guarantee instruments but not eliminate them completely, since they are also potentially useful in providing comfort to investors and creditors. The best way to reduce the fiscal burden of guarantees is to strengthen the PPP project cycle in a country. Countries should continuously strive to develop adequate government capacity for conceiving, planning, and designing projects, and to embed in these processes adequate transparency, checks and balances. Incentive problems in PPPs may also be mitigated by rewarding proponents with greater equity risk capital in projects (instead of mostly project debt financing as is the norm in PPPs).

Beyond the issue of price controls during economic crises, having adequate regulatory capacity reduces project stress and leads to better outcomes. Empirical results suggest that regulatory risk is highest under price cap regulation. It may be the case that price caps tend to be

too rigid during economic crises. Regulators may be well-advised to ensure greater flexibility in the treatment of projects during times of crisis.

The quality of project management and personnel in firms is itself a key determinant of project outcomes. Governments must strive to select firms dedicated to achieving efficiency. The ability to innovate is particularly important, especially in sectors where achieving short-run efficiency is key to sustaining investment and keeping price pressures in check (such as in water supply and electric distribution concessions). Innate firm capability matters as well, as this could help create efficiencies in service that could keep prices in check and increase public acceptance of the project, thereby lowering political risk. As such, project firms should not only be selected on the basis of price, but on basis of their innate capabilities as well. Efficiency lowers costs and keeps tariffs down as well. Also, when designing policy for PPP, governments could concentrate on mechanisms and incentives that encourage the attainment of efficiency throughout the project, but most especially at the beginning of the operations phase, the most failure-prone part of the project cycle. Thus, guarantee protection can also be designed to decline as the project matures.

Given the pervasiveness of political risk, the benefits of political risk guarantees (PRGs) should be emphasized - not only the cover provided by the PRG itself, but also the value added to the project by services related to the PRG, such as advisory services in project design, planning and operations. Multilateral and bilateral sources would do well to strengthen the attractiveness of their existing PRG instruments, more finely calibrate their applicability and importantly, enhance their affordability (if not presently provided free of charge). To enhance availability of PRGs, providers may consider reinsuring PRGs. Governments providing government guarantees may also wish to consider reinsuring them. Reinsurance provides several benefits. It protects PPP insurers (PRG providers or governments) from losses and allows insurers to assume greater individual risks and offer greater levels of protection than their size would otherwise allow. Reinsurance of PPP risks also helps make insurer cash flows smoother, more stable, and predictable. In turn, reinsurance markets would be more robust if reinsurance risks could be shared among a group of reinsurers. This would further diversify risk. Other systemic protection mechanisms could be considered, for example earmarking income taxes collected from PPP projects into one large (but limited) support fund dedicated to financing fiscal backstops, the design of future projects, and other PPP capacity-building expenditures.

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## **APPENDIX A: VARIABLES IN REGRESSION ANALYSIS**

### **DEPENDENT VARIABLES**

Has the private investor exited (cancellation) or considered exiting (distress) the project? FAIL (discrete)—1 if the project is listed in the PPI database as being “distressed” or “cancelled,” 0 otherwise. Source: World Bank’s PPI database.

### **INDEPENDENT VARIABLES**

#### **Regulation**

What is the actual or perceived degree of regulatory independence? INDEPREG (discrete)—1 if the sector is perceived as not having an independent regulator, 0 otherwise. Sources: Singh (2005, 2007), Kennedy (2003), and CUTS (2006).

Was the project subject to price cap regulation? PRICECAP (discrete)—1 if yes, 0 otherwise. Sources: Singh (2005, 2007), Kennedy (2003), and CUTS (2006).

Was the project subject to rate of return regulation? ROR (discrete)—1 if yes, 0 otherwise. Sources: Singh (2005, 2007), Kennedy (2003), and CUTS (2006).

Was contract award based on lowest tariff bid? LOWPRICE (discrete)—1 if the basis for awarding the contract was the lowest price offered. Source: World Bank PPI database, augmented by data gathered by the author from Singh (2007) and various reports available from the web. Although data from the PPI dataset were thin, they were nonetheless used in the regressions.

Was contract award based on highest payment? HIGHPRICE (discrete)—1 if the basis for awarding the contract was the highest price offered. Source: World Bank PPI database, augmented by data gathered from by the author from Singh (2007) various reports available from the web. Although data from the PPI dataset were thin, they were nonetheless used in the regressions.

#### **Tariff/Political**

Did the project go through a period in which a tariff freeze was imposed by government executives? TARIFFFRZ2 (discrete)—1 yes, 0 otherwise. Source: Author’s review of individual country experiences, from newspaper reports and existing literature.

Did the project go through a period in which a tariff freeze was imposed by government executives, along with convertibility restrictions? TARIFFFRZ3 (discrete)—1 if the project scores a 1 in the variable TARIFFFRZ2 above, and there was evidence of other government actions undermining tariffs (such as suspension of convertibility, etc.), 0 otherwise. Source: Author’s review of individual country experiences, from newspaper reports and existing literature.

Duration of tariff freeze during the investment horizon. YRSFRZ (discrete). Source: Author’s review of individual country experiences, from newspaper reports and existing literature.

Did the project go through a period in which its tariff was frozen, or there was some other stress event within the first two years after a change in political leadership? POLSTRESS2

(discrete) - 1 if yes, 0 otherwise. Source: Author's review of individual country experiences, and datasets on political regime change, from the POLITY IV dataset from Marshall and Jaggers (2007) and Gasiorowski (1996).

The tariff variables developed for this study (TARIFFFRZ2, TARIFFFRZ3, YRSFRZ and POLSTRESS2) are proxies for political risk. They capture various political motives, ranging from the desire to insulate the public from macroeconomic shocks (at the expense of the firm), to the desire to gain favorable approval ratings. Unlike tariff freezes imposed by independent regulators, which tend to cover only a subset of sectors, sweeping tariff freezes imposed by government executives tend to have more systemic effects. At the same time, since government executives have other discretionary powers (such as suspending convertibility, or cancelling/renegotiating/expropriating a project) broadly defined political risk can be the key determinant of outcomes in PPP projects.

### **Variables from the Database of Political Institutions (Beck, et al, 2001)**

Number of years the chief executive has been in office in the last 3 years prior to current period, or prior to cancellation or conclusion of project (continuous)—YRSOFC3CAN

Type of political system in the last 3 years prior to current period, or prior to cancellation or conclusion of project – Presidential 0, Assembly-Elected President 1, Parliamentary 2 (discrete)—SYSTEM3CAN

Rating on level of checks and balances in the last 3 years prior to current period, or prior to cancellation or conclusion of project (discrete) – CHECKS3CAN

Party of chief executive has been how long in office in the last 3 years prior to current period, or prior to cancellation or conclusion of project? (discrete) – PRTYIN3CAN

Executive Indices of Electoral Competitiveness (discrete) – greater level of competition gets higher score (discrete) – EIEC3CAN

Also, all of the above variables in the last 3 years prior to financial closure of project (during the planning stages): YRSFIN, SYSTEMFIN, CHECKSFIN, PRTYINFIN, EIECFIN

### **Legal and institutional framework (World Bank Governance Indicators)**

Rule of law - the extent to which agents have confidence in and abide by the rules of society; includes the quality of contract enforcement and property rights, the police, and the courts, as well as the likelihood of crime and violence: RULE (continuous)—country's average annual score by for this criterion in the World Bank's governance indicators.

Government effectiveness - the quality of public services; the capacity of the civil service and its independence from political pressures; and the quality of policy formulation. GOVEFF (continuous)—country's average annual score by for this criterion in the World Bank's governance indicators.

Control of corruption - the extent to which power is exercised for private gain; includes both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests: CORRUPT (continuous)—country's average annual score by for this criterion in the World Bank's governance indicators.

Political stability - the likelihood that the government will be destabilized through unconstitutional or violent means, including terrorism: POLSTAB (continuous)—country's average annual score by for this criterion in the World Bank's governance indicators.

Regulatory quality - the ability of the government to provide sound policies and regulations that enable and promote private sector development: REGQUAL (continuous)—country's average annual score by for this criterion in the World Bank's governance indicators.

Voice and accountability - the extent to which a country's citizens are able to participate in selecting their government; includes freedom of expression, freedom of association, and a free media: VOICE (continuous)—country's average annual score by for this criterion in the World Bank's governance indicators.

### **Macroeconomic—economic conditions during the operations phase**

Most of the macroeconomic data comes from the International Monetary Fund's International Financial Indicators (IFS)

Average rate of real per capita GDP growth in the last 6 years prior to current period, or prior to cancellation or conclusion of project (continuous)—this is a proxy for capacity to pay: AVGPCGR6TRM.

Average change in real exchange rate in the last 6 years prior to current period, or prior to cancellation or conclusion of project (continuous): AVGRER6TRM.

Average standard deviation of real exchange rate in the last 6 years prior to current period, or prior to cancellation or conclusion of project (continuous): AVGSTDREER6TRM.

Average inflation rate in the last 6 years prior to current period, or prior to cancellation or conclusion of project (continuous): AVGINF6TRM.

Average of the ratio of total exports plus imports divided by gross domestic product in the last 6 years prior to current period, or prior to cancellation or conclusion of project (continuous): OPEN6TRM.

### **Project design phase**

#### **Economic conditions during project design phase**

Average rate of real per capita GDP growth in the last 6 years prior to financial closure (continuous): RPCGDPGR6PRCLOS. Source: IFS.

Average standard deviation of real exchange rate in the last 6 years prior to financial closure (continuous): STDREER6PRCLOS. Source: IFS.

#### **Structure of transaction**

Type of transaction (discrete)—The following variables are binary in nature; 1 if the condition is present, 0 otherwise. Source: World Bank's PPI database.

Management contract (MGTCN), Concession (CONCESS), Divestiture (DIVEST) - Full (FULL) or Partial (PARTIAL), Greenfield (GREEN), Merchant (MERCH)

Type of PPI (discrete)—The following variables are binary in nature; 1 if the condition is present, 0 otherwise. Source: World Bank's PPI database.

BOT- build-operate-transfer, BOO – build-operate-own

Was the infrastructure built by the proponent? BUILD (discrete, 1 or 0). Source: World Bank's PPI database.

Was the infrastructure owned by the proponent? OWN (discrete, 1 or 0).- Source: World Bank's PPI database.

Was rehabilitation involved? REHAB (discrete, 1 or 0). Source: World Bank's PPI database.

Contract period: CONPER (continuous). Source: World Bank's PPI database.

Value of investment (continuous) - INVST (continuous, investment in physical assets) and TINVST (continuous, total investment). Source: World Bank's PPI database.

Value of investment to GDP ratio - INVST2GDP (continuous). Sources: World Bank's PPI database and IFS

### **Multilateral or bilateral support**

Loan: LOAN (discrete)—1 if the project received a loan from multilateral financial agencies (MFIs), 0 otherwise. Source: World Bank PPI database.

Political risk guarantee: GUAR (discrete)—1 if the project received a political risk guarantee from MFIs, 0 otherwise. Source: World Bank PPI database.

Equity: EQUITY (discrete)—1 if the project received equity from MFIs, 0 otherwise. Source: World Bank PPI database.

Risk management: RISK (discrete)—1 if the project received financial risk management services from MFIs, 0 otherwise. Source: World Bank PPI database.

Cumulative support: CUMSUP2 (continuous)—total amount of support from MFIs. Source: World Bank PPI database.

No assistance from MFIs: NOASSIST (discrete)—1 if the project did not receive assistance from MFIs, 0 otherwise. Source: World Bank PPI database.

### **Contract**

Government fiscal support: GOVRISK (discrete)—1 if the project benefited from some form of risk absorption by government, 0 otherwise. Source: World Bank's PPI database, as augmented by information from. The glossary of the World Bank's PPI database lists primarily greenfield projects as receiving explicit forms of guarantees (the exception being merchant facilities). This includes projects designed as build-lease-transfer (BLT), build-operate-transfer (BOT), build-operate-own (BOO) and projects wherein governments rent facilities from private investors.

Contracted with federal or local government? FEDCON (discrete)—1 if the project was contracted by the federal government, 0 otherwise. Source: World Bank's PPI database.

### **Nationality**

Foreign investor involvement: FDI (discrete)—1 if there was foreign investor involvement in the project, 0 otherwise. Source: World Bank's PPI database.

### **Country's fiscal capacity**



Average fiscal position (cash surplus or deficit) in the last 6 years prior to current period, or prior to cancellation or conclusion of project: AVGSUR6TRM (continuous). Source: IFS.

Number of projects supported by the country since start of data collected: NUM (discrete). Source: World Bank's PPI database.

Number of years since the first recorded PPP project in the country: TIMEPER (discrete). Source: World Bank's PPI database.

Short-term debt to exports ratio: SHORTDEBTEX (continuous). Source: IFS.

Absolute number of IPPs: IPPS (discrete). Source: World Bank's PPI database.

### **Dummy variables**

Sectoral dummies (The primary source of data is the World Bank's PPI database)

Primary sector dummies—ENERGY, WATER, TELECOM, TRANSPORT

Sub-sector dummies—ELECSUB (electricity), GENER (generation), DISTRIB (distribution), TRANS (transmission), NATGASUB (natural gas)

Water and sewerage dummies—UTILITY, TREAT (treatment and sewerage)

Telecoms dummies—FIXDACC (fixed access), MOBILE

Transport dummies—HIGHWAY (highway), ROADS (toll roads), SEAPORT, AIRPORT, RAIL

Regional dummies—these are regional groupings based on the World Bank's PPI database. Latin America and the Caribbean (LATAM), East Asia and the Pacific (EASIA), South Asia (SASIA), Eastern Europe and Central Asia except Russia (EUROCNORUS), Europe and Central Asia (EUROCASIA), Middle East and North Africa (MENA), Sub-Saharan Africa (AFRICA)

**Others** - Size of population: POP6TRM . Source: IFS

## APPENDIX B: REGRESSION RESULTS

**Dependent Variable: Project Outcome FAIL (=1 if contract was cancelled, 0 otherwise), coefficients of variables are followed below by their p-values**

	Two-step probit	Two-step probit	Two-step probit	Two-step probit	Two-step probit	Two-step probit	Two-step probit
<b>Equation</b>	1	2	3	4	5	6	7
tariffrrz2	6.028	8.091	2.193	2.133	4.068	4.089	3.110
	0.002	0.000	0.019	0.009	0.000	0.000	0.001
avgpcgr6trm	-1.489	-1.639	-1.375	-1.130	-0.770	-0.768	-1.007
	0.000	0.001	0.001	0.003	0.087	0.088	0.008
opentrm6	-0.364	-0.334	-0.099	-0.086	-0.129	-0.130	-0.127
	0.000	0.000	0.000	0.000	0.000	0.000	0.000
avgstdrer6trm	0.157	0.171	0.137	0.122	0.126	0.126	0.131
	0.005	0.014	0.015	0.009	0.016	0.016	0.005
rpcgdpr6prclos	0.223	0.154	0.403	0.268	0.319	0.322	0.369
	0.035	0.085	0.000	0.000	0.000	0.000	0.000
Fedcon	-0.860		-0.901				
	0.076		0.021				
checks3can	-1.343	-1.533					
	0.000	0.000					
system3can	1.938	3.065					
	0.003	0.000					
fraud3can		1.585					
		0.038					
loan			0.954				
			0.048				
bot				0.465			
				0.094			
elec					-2.890		
					0.000		
gener						-2.913	
						0.000	
distrib							2.246
							0.004

_cons	3.426	1.302	0.595	-0.342	-0.942	-0.955	-1.238
	0.174	0.656	0.735	0.820	0.577	0.572	0.425
obs	978	977	979	979	979	979	979
Wald	61.79	73.94	88.24	78.78	91.15	91.25	87.63
	Instruments:	Instruments:	Instruments:	Instruments:	Instruments:	Instruments:	Instruments:
	opentrm6	opentrm6	opentrm6	opentrm6	opentrm6	opentrm6	opentrm6
	avgstdrer6trm	avgstdrer6trm	avgstdrer6trm	avgstdrer6trm	avgstdrer6trm	avgstdrer6trm	avgstdrer6trm
	rpcgdpgr6prclos	rpcgdpgr6prclos	rpcgdpgr6prclos	rpcgdpgr6prclos	rpcgdpgr6prclos	rpcgdpgr6prclos	rpcgdpgr6prclos
	fedcon	fraud3can	fedcon	bot	elec	gener	distrib
	checks3can	checks3can	loan	corrupt	corrupt	corrupt	corrupt
	system3can	system3can	corrupt	voice	voice	voice	voice
	corrupt	corrupt	voice	checksfin	checksfin	checksfin	checksfin
	voice	voice	checksfin	num	num	num	num
	checksfin	checksfin	num				
	num	num					

	Two-step probit	Two-step probit	Two-step probit	Two-step probit	Two-step probit	Two-step probit	Two-step probit
<b>Equation</b>	8	9	10	11	12	13	14
tarifffrz2	7.836	8.799	5.767	2.616	1.747	2.420	1.505
	0.023	0.010	0.000	0.001	0.003	0.004	0.013
avgpcgr6trm	-1.976	-1.777	-1.234	-1.876	-1.622	-1.808	-1.621
	0.041	0.027	0.000	0.001	0.000	0.015	0.000
opentrm6	-0.568	-0.503	-0.320	-0.327	-0.405	-0.384	-0.403
	0.000	0.000	0.000	0.000	0.000	0.000	0.000
avgstdrer6trm	0.208	0.177	0.120				
	0.007	0.014	0.061				
rpcgdpgr6pclos	-0.009			0.260	0.266	0.238	0.225
	0.957			0.001	0.000	0.018	0.000
fedcon	-2.915	-3.085		-1.770	-0.920	-1.703	-1.188
	0.002	0.001		0.000	0.001	0.000	0.000
checks3can	-2.497	-2.049	-1.217	-1.307	-1.631	-1.559	-1.643
	0.001	0.007	0.000	0.000	0.000	0.000	0.000
system3can	2.444	2.566	2.291				
	0.020	0.005					
ror	-4.687	-5.146		-1.653		-1.425	
	0.018	0.007		0.003		0.018	
yrsofc3can			-0.014		-0.127	-0.184	-0.116
			0.035		0.001	0.006	0.002
stdrer6pclos						-0.074	
						0.090	
fdi							-0.804
							0.075
_cons	12.771	10.635	3.508	10.380	10.485	12.452	11.389
	0.007	0.015	0.081	0.000	0.000	0.000	0.000
obs	778	774	977	977	995	769	995
Wald	33.67	32.970	68.86	48.77	74.81	44.21	72.31

	Instruments:	Instruments:	Instruments:	Instruments:	Instruments:	Instruments:	Instruments:
	opentrm6	opentrm6	opentrm6	opentrm6	opentrm6	opentrm6	opentrm6
	avgstdrer6trm	avgstdrer6trm	avgstdrer6trm	rpcgdpgr6prclos	rpcgdpgr6prclos	rpcgdpgr6prclos	rpcgdpgr6prclos
	rpcgdpgr6prclos	checks3can	avgpcgr6trm	checks3can	checks3can	checks3can	checks3can
	checks3can	system3can	checks3can	fedcon	fedcon	fedcon	fedcon
	system3can	corrupt	system3can	ror	yrsofc3can	yrsofc3can	yrsofc3can
	corrupt	voice	corrupt	corrupt	corrupt	ror	fdi
	voice	checksfin	voice	voice	voice	stdrer6prclos	corrupt
	checksfin	num	checksfin	checksfin	checksfin	corrupt	voice
	num	fedcon	num	num	num	voice	checksfin
	fedcon	avgpcgr6trm				checksfin	num
	avgpcgr6trm					num	

	Two-step probit	Two-step probit	Two-step probit
<b>Equation</b>	15	16	17
tariffrrz2	-2.027	2.002	1.893
	0.060	0.000	0.001
avgpcgr6trm	-1.308	-0.415	-0.466
	0.009	0.105	0.074
opentrm6	-0.173	-0.085	-0.082
	0.045	0.000	0.000
rpcgdpr6prclos	0.305	0.157	0.177
	0.001	0.002	0.001
fedcon	-1.899	-1.063	-1.100
	0.000	0.001	0.001
checks3can	-1.210		
	0.002		
fdi		-1.214	-1.160
		0.005	0.010
avgrer6trm	-0.329		
	0.000		
govrisk		0.384	0.405
		0.084	0.077
loan			0.683
			0.042
_cons	7.113	0.281	0.282
	0.027	0.731	0.732
obs	978	977	996
Wald	79.27	37.57	37.28
	Instruments:	Instruments:	Instruments:
	opentrm6	opentrm6	opentrm6
	rpcgdpr6prclos	rpcgdpr6prclos	rpcgdpr6prclos

	checks3can	fedcon	fedcon
	fedcon	avgrer6trm	avgrer6trm
	avgrer6trm	fdi	fdi
	corrupt	govrisk	fedcon
	voice	corrupt	loan
	checksfin	voice	govrisk
	num	checksfin	corrupt
		num	voice
			checksfin
			num

## Appendix C: Cancelled projects in selected countries

**Table C.1: Canceled projects in Indonesia**

Year started	Name	Type of PPP	Mode	Sector	Sub-sector	Termination year
1994	Karaha Bodas Company	Greenfield project	Build, own, and operate	Energy	Electricity generation	1998
1996	Dieng Geothermal Power Plant	Greenfield project	Build, operate, and transfer	Energy	Electricity generation	2001
<b>1997</b>	<b>Patuha Power Ltd.</b>	<b>Greenfield project</b>	<b>Build, operate, and transfer</b>	<b>Energy</b>	<b>Electricity generation</b>	<b>1998</b>
<b>1993</b>	<b>PT Satelindo Palapa Indonesia</b>	<b>Greenfield project</b>	<b>Merchant</b>	<b>Telecom</b>	<b>Mobile access and long distance</b>	<b>2002</b>
<b>1996</b>	<b>PT Ariawest International</b>	<b>Concession</b>	<b>Build, rehabilitate, operate, and transfer</b>	<b>Telecom</b>	<b>Fixed access</b>	<b>2003</b>
<b>1996</b>	<b>PT Bukaka Singtel International</b>	<b>Concession</b>	<b>Build, rehabilitate, operate, and transfer</b>	<b>Telecom</b>	<b>Fixed access</b>	<b>2006</b>
<b>1996</b>	<b>PT Daya Mitra Telekomunikasi</b>	<b>Concession</b>	<b>Build, rehabilitate, operate, and transfer</b>	<b>Telecom</b>	<b>Fixed access</b>	<b>2001</b>
<b>1996</b>	<b>PT Mitra Global Telekomunikasi</b>	<b>Concession</b>	<b>Build, rehabilitate, operate, and transfer</b>	<b>Telecom</b>	<b>Fixed access</b>	<b>2004</b>



1996	PT Pramindo Ikat Nusantara	Concession	Build, rehabilitate, operate, and transfer	Telecom	Fixed access	2002
1993	Jakarta Outer Ring Road (S and E1 sections)	Concession	Build, rehabilitate, operate, and transfer	Transport	Highway	1998
1995	Jakarta Outer Ring Road (E2, E3 and N sections)	Concession	Build, rehabilitate, operate, and transfer	Transport	Highway	1998

**Table C.2: Canceled projects in Malaysia**

Year started	Name	Type of PPP	Mode	Sector	Sub-sector	Termination year
1988	Celcom	Greenfield project	Build, own, and operate	Telecom	Fixed access, mobile access, and long distance	2014
1994	Time dotCom	Greenfield project	Build, own, and operate	Telecom	Fixed access and long distance	2001
1995	Citifon Sdn Bhd	Greenfield project	Build, own, and operate	Telecom	Fixed access	1999
1993	Sistem Transit Aliran Ringan Sdn Bhd (STAR-LRT)	Greenfield project	Build, operate, and transfer	Railroads	Fixed assets and freight	2002
1996	Ringan Automatik Sdn Bhd (PUTRA)	Greenfield project	Build, operate, and transfer	Railroads	Fixed assets and freight	2002
1993	Indah Wastewater Urban Sewerage	Concession	Build, rehabilitate, operate, and transfer	Utility	Sewerage collection and	2000

	Rehabilitation				treatment	
1995	Kelantan Water Supply	Concession	Rehabilitate, operate, and transfer	Utility	Water utility without sewerage	<b>1999</b>

**Table: C.3 Cancelled projects in the Philippines**

Year started	Name	Type of PPP	Mode	Sector	Sub-sector	Termination year
1991	Navotas Diesel Power Plants	Greenfield project	Build, operate, and transfer	Electricity	Electricity generation	2005
1993	Subic Bay Plant	Greenfield project	Build, operate, and transfer	Electricity	Electricity generation	2003
2001	Ninoy Aquino International Airport Terminal 3	Greenfield project	Build, operate, and transfer	Airports	Terminal	2002
1997	Maynilad Water Services	Concession	Build, rehabilitate, operate, and transfer	Utility	Water utility with sewerage	2005

1999	Magdalena Laguna Water System	Management and lease contract	Lease contract	Utility	Water utility without sewerage	2002
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