

Public-Private Partnerships Lessons from Asia

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Background to PPP in Asia – helped spur infrastructure development

- Public-Private Partnerships in infrastructure have been around in Asia for many years.
- Way to plug infrastructure expenditure gaps and support rapid growth and development in Asia
- Initial PPP's in the power sector to alleviate budget constraints of state-run utilities and an expeditious way to construct plants

History of PPP in Asia

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

Table 3

Country	Year of first PPP	Project	Current Status				
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 Sdn Bhd	Operational	Greenfield project	Build, own, and operate	Energy	Natural gas distribution
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

Projects around the world

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)

Most in greenfield investment

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

Various levels of government contracting

Table 6

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

Multilateral agencies are involved in PPP as well

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

Notable aspects of early PPP experience in Asia

- The Philippines legislated the Build-Operate-Transfer (BOT) Law in 1994 to expedite investment in power generation to address crippling outages
- Terms of contracts tended to vary across countries. Some governments assumed more risk than others.

PPP's had fiscal implications

- PPP structural and transactional templates in power were used as basis for developing projects in other sectors (e.g., Philippines Metro Rail Transit)
- Gave rise to contingent liabilities as governments assumed risks in PPP structures they may not have been in the best position to control
- Complicated project structures led to delays in project development and implementation, which subsequently led to increases in project cost

PPP's had fiscal implications

- Toll road projects also necessitated the purchase of right of way, the cost of which was not anticipated
- There was also a strong requirement for government agencies to act in concert or in coordination with one another. Inability to do so undermined projects.

PPP's had economic implications

- The growing portfolio of PPP projects triggered an increasing cognizance that improperly structured projects created adverse behavioral incentives among stakeholders in projects which could undermine subsequent project outcomes.
- There is a need to empirically validate this hypothesis and also to explore the implications of these theories further.

PPP problems reflected in PPP performance in Asia

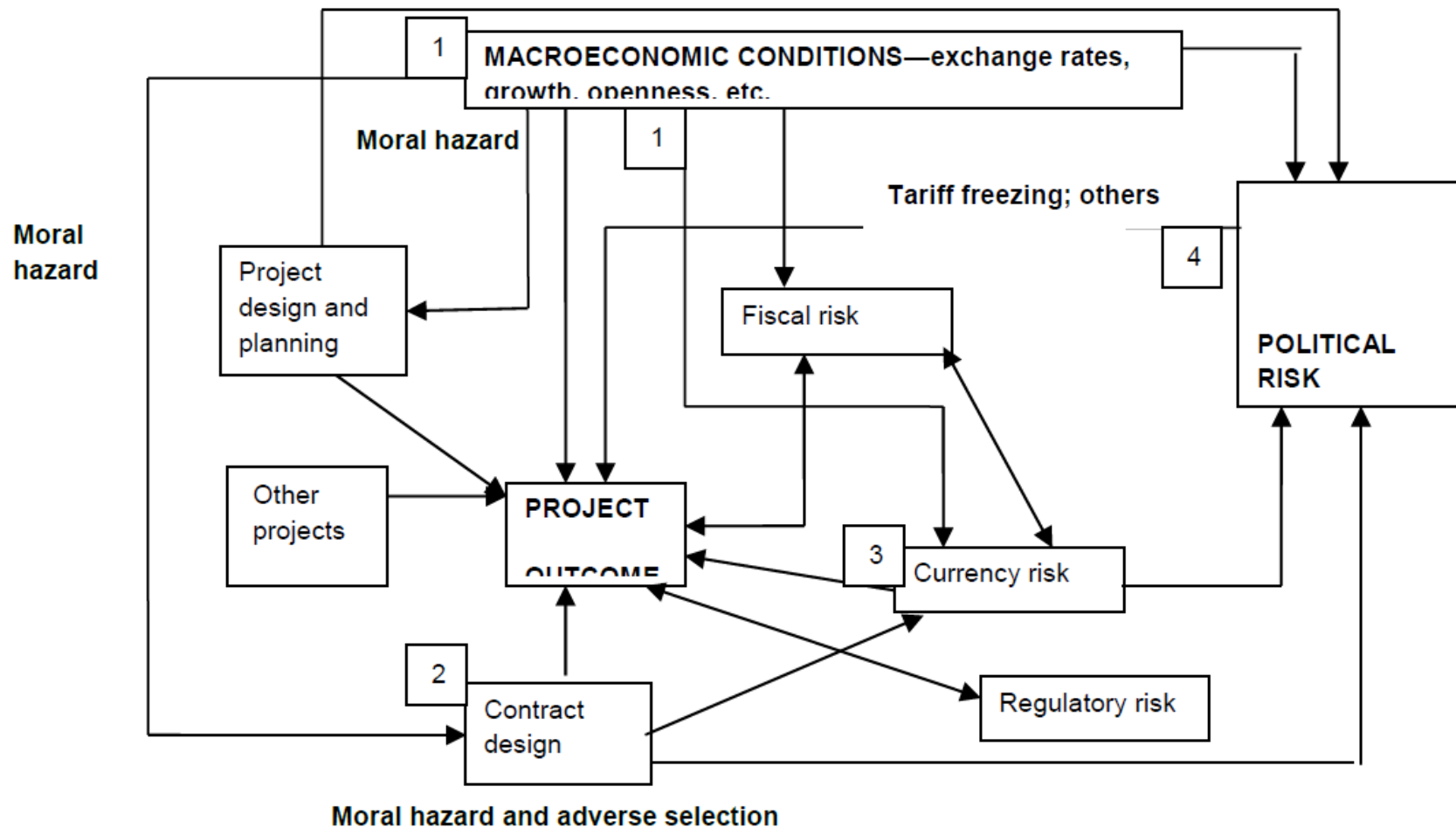
Table 8: Estimated Renegotiated PPP Contracts in East Asia, 1986-2008

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

Macroeconomic Crises: Biggest Risk to PPP

Figure 3: Outcomes of Projects: A Schematic Diagram



Evolution of PPP stress from macroeconomics

- A macroeconomic crisis occurs, triggering a devaluation of the currency
- Depending on what the contract stipulates, currency risk is either borne by the project's investor, or by consumers
- If borne by the investors, project operations can be undermined
- If borne by consumers, the country's highest officials can opt to freeze tariffs, undermining project financing

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".

Empirical Study on Global and Asian PPP

- Researchers have also been trying to relate PPP risks to incentives faced by stakeholders in projects (agency theory)
- A paper by Reside and Mendoza (2009) seems to validate the findings of PPP agency theory, and in addition, suggests additional extensions to current PPP agency models. Reside and Mendoza use data from the World Bank's PPI database to estimate the determinants of project failure in PPP (defined as projects whose status is either canceled or distressed).

Econometric model to estimate sources of stress in Global/Asian PPP

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.

Raises failure rate	Reason
Tariff freezing episode in project life	Tariff freezing adversely affects revenues
Standard deviation of real exchange rate prior to cancellation or termination of project or current period	Macroeconomic volatility and uncertainty increases rate of project failure
Average real per capita GDP growth 6 years prior to financial closure	Moral hazard in high growth environment
System of government closer to parliamentary than presidential	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.
Loan was provided by multilateral financial institution	Participation of multilaterals have not helped projects
BOT basis	Chosen private proponents could improve; building new capacity is inherently risky
Raises failure rate	Reason
Countries where fraud or candidate intimidation was serious enough to affect the outcome of elections	Governments that commit fraud do not design and plan good PPP projects
Power distribution	Upstream sector is risky and subject to price regulation and more politicization
Government assumes risks/guarantee	Moral hazard leads to poorer project design and implementation

Reduces failure rate	Reason
Average per capita GDP growth 6 years prior to termination or current period	Growth reduces operating risks
Standard deviation of real exchange rate prior to project closure	Moral hazard of rigid and exchange rates – encourages stakeholders to discount currency risk
Openness	Open societies and economies are better able to sustain large private investments
Contracted with federal government	Federal government is superior to local government in planning, coordinating and helping to implement PPP
Extent of foreign direct investment	Foreign technologies and capital are good for PPPs in Asia
Extent of checks and balances in government	Greater checks and balances strengthen project design, planning and implementation
Reduces failure rate	Reason
The longer the time a chief executive is in office prior to cancellation or failure	More stable regimes do better at designing, planning and implementing PPP projects
Power generation	Downstream sector for power is less risky and not as politicized as upstream sector; also prices are not regulated
Electricity sector	Region is generally hospitable to PPP in this sector because it is highly dependent on power for manufacturing; development, modernization
Rate of return regulation	Price cap regulation imposes strong binding constraints on projects
Greater the extent of private ownership	Shields the project from political risk as well as inefficient political decision-making by insiders
Average real exchange rate 6 years prior to termination or current period	Real appreciation reduces debt servicing costs

Reside and Mendoza study identified the major risks affecting global PPP

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

Recent PPP Research: Reside, Balanquit and Alonzo (2015)

- The Philippines' PPP portfolio is assessed against optimality and risk-reduction benchmarks suggested by a review of recent theory and international empirical analysis of Public-Private Partnerships (PPP).
- Look for incentive-compatible project structures in actual projects

Agency Theory and PPP

- The principal-agent, or agency literature on PPP suggests that contracts that are closer to the social optimum are characterized by the following circumstances:
- Ownership of the asset by the private proponent;
- Building of the asset by the private proponent;
- Operation of the asset by the private proponent;
- PPP assets that are more generic rather than of specific use; and
- PPP in sectors with more stable demand or where demand depends more closely on the actions of proponents (primarily transport and water sector projects).

Table 2: According to the literature, the following factors lead to sub-optimal PPP contracts

Feature of contract or transaction	PPI Type or sector	Reason for sub-optimality in the literature
Private proponent will not build the asset	concession agreement management contract	Insufficient incentives to pursue quality-enhancing innovations to reduce operating costs
Private proponent will not operate the asset	BLT	Insufficient incentives to pursue quality-enhancing innovations to reduce operating costs
Private proponent will not own the asset	BTL, BOT, BOLT, BLT, concession agreement management contract, lease	Will not have property rights over residual value
Quick-moving sectors	Information technology	Technology quickly becomes obsolete
Assets devoted to very specific use	Power plants, mass transit, prisons, hospitals, etc.	Provide weaker incentives for quality-enhancing innovations to reduce operating costs and/or attract a wider customer base.
Volatile demand	Excludes transport and water sectors	Make demand over- and under-projections more likely, undermining project operations
Government provides guarantees	Various sectors	Insufficient incentives to pursue quality-enhancing innovations to reduce operating costs

Source: Authors

Philippines project structures getting closer to optimal structures suggested by agency theory

- The authors review the current portfolio of PPP projects in the Philippines and find that compared to the years prior to 2000, the Philippines' PPP projects have moved closer to welfare-maximizing and risk-minimizing project structures (as identified by the agency theory literature), improving project outcomes overall and reducing project stress.
- Some trends, including greater participation of domestic financiers and smaller projects, and relative macroeconomic stability have contributed to better outcomes over time. Several outstanding principal-agent issues, however, remain.