Public Private Partnership (PPP) for Asia Infrastructure: A Public Investment Perspective

By George Abonyi and David Abonyi

I. Introduction

Asia is faced with an enormous infrastructure investment challenge over the next 10 years (2010-2020) in order to sustain its impressive economic growth. Public-private partnership (PPP) is seen by governments, investors, and international financial institutions as a critical part of the needed response to this challenge. This brief has a simple message: in meeting Asia’s massive financing needs for physical and social infrastructure, public-private partnership (PPP) initiatives, generally involving large-scale or mega-projects, should be undertaken within the broader framework of public investment planning. The basic argument is as follows. It is the fundamental responsibility of government to ensure that infrastructure services serve the public interest. In this context, all forms of PPP commit societal resources to a varying extent, whether explicitly or implicitly. Therefore governments must clearly identify options and weigh the benefits of private participation against the real costs to the economy and society of public obligations and commitments likely to be incurred. For this, it is essential to approach PPP from an explicit public interest perspective in order to ensure that such investment decisions are well informed – starting from a consideration whether a project should be undertaken at all. This will help avoid a potential bias in favour of PPPs simply because they involve private finance, and may under some conditions generate revenues for government. Therefore a well-thought out public investment framework must provide the foundations for an effective PPP strategy, and this is likely to lead to a more successful use of private resources and skills in infrastructure services to serve broader societal interests. Korea provides an interesting example of this general approach to infrastructure investment planning and PPP, and will be referred to in this note.

The next section summarizes Asia’s infrastructure financing needs. Key elements of PPP – the why, what, and how – are then discussed briefly. The following section then outlines key elements of a public investment framework for an effective PPP strategy that is more likely to serve the public interest. The concluding section touches on the institutional dimension of PPP from this perspective. It should be noted that this Brief is not intended to be a comprehensive paper on the details of PPP, or on how best to implement it. There is a wide range of excellent references available for this purpose, e.g. ADB (2008), APEC (2009), UNECE (2008), and the World Bank Institute-convened Global PPP Network.1

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II. The Challenge: Asia’s Infrastructure Investment Needs

Asia’s infrastructure financing challenge is estimated at $8-$10 trillion over the 10 years 2010-2020, or averaging $800 billion - $1 trillion per year; most of it in Southeast, East, and South Asia. This is equivalent to 5-6% of the annual GDP of the region, which is also the rule of thumb suggested for a growing economy’s annual investment in infrastructure, as compared for example with the 2% per annum average of infrastructure investment in Southeast Asia and India in recent years. The required investment is approximately 2.5 times (in real terms) the infrastructure investment undertaken in the preceding 10 years (2000-2010), which was around $4 trillion, or 4% of the region’s GDP. Of the total investment of $10 trillion, approximately 20% is projected as needed for social infrastructure (e.g. health, education); 40% for energy (electricity), 25% for transport, 11% for telecommunications, and 4% for water and sanitation.

As many things in Asia, the infrastructure financing needs of the region should be seen against the backdrop of the Asian Crisis (1997/98) which led to a significant drop in investment and from which it is yet to fully recover. For example, Thailand’s gross capital formation fell from 41.8% of GDP in 1996 to 21.8% of GDP in 2009; Malaysia from 43% of GDP in 1997 to 14.5% in 2009; and the Philippines from 24.8% in 1997 to 14.6% in 2009. This very sharp drop in total investment has been the result of a fall in foreign direct investment, as well as less public investment because of accumulated fiscal imbalances. Private investment has also followed this trend. The 2008 global financial crisis led to further decrease in available financing in the region, shortened available credit, reduced cash flow revenues (because of the general economic downturn), and heightened uncertainty in exchange rate movements – all of which further constrained private financing for project investment in Asia.

The primary potential source of financing for Asian infrastructure should be the region’s vast domestic savings. For example, Asia’s official reserves increased from $485 billion in 1997 at the onset of the Asian Crisis, to $5.3 trillion in 2010, of which developing Asia’s reserves stood at $3.63 trillion – with China holding an estimated $2.45 trillion.

In response to the global financial crisis, many Asian countries implemented large fiscal stimulus programs, much of it aimed at infrastructure spending. (See Table 1) These programs, in turn, put varying levels of strain on the respective governments’ budgets. However, such fiscal deficits must be viewed against the general performance of an economy. For example, some Asian economies, such as China, with relatively low public debt-to-GDP ratios (15.7% in 2008) and strong export earnings, may be able to finance a significant fiscal stimulus package; while others like Thailand (42% of public debt-to-GDP ratio in 2008) or Vietnam (38.6%) may find it more difficult.

Therefore the key issue is how can Asian economies meet the challenge of financing the massive infrastructure spending needs of the next 10 years, and the related fiscal deficits, necessary for sustaining economic growth for employment and income generation. This is where the role of the private sector becomes essential. As of 2010 the private sector accounted for around 20% of infrastructure investment in Asia, while public funding accounted for 70%, and official development assistance for the remaining 10%. Given the constraints on Asian government budgets, significant additional private sector financing and a corresponding decrease in public investment requirements will be essential to meet the region’s infrastructure challenge.

III. The Response: Public-Private-Partnership (PPP)

1. Why PPP

The basic rationale for attracting private sector investment in Asian infrastructure is primarily twofold: to provide new options for public service delivery, given government budget constraints; and to introduce private sector efficiency and innovation in the provision of what have been traditionally public services. Beyond loosening public budget constraints, a PPP project can be said to generate value improvements whenever it achieves one or more (preferably all) of the following benefits: (i) reduced life-cycle costs; (ii)
Many large-scale infrastructure projects are not likely to be viable on a purely commercial basis due to unreliable cash flows or non-commercial project risk.

If private participation in the public service delivery has all these expected benefits, then why not have all or most such services be delivered just by the private sector – is PPP one “P” too many? In practice, many large-scale infrastructure projects, particularly in developing economies, are unlikely to be viable on a purely commercial basis because of project economics (e.g. not able to generate reliable and sustained cash flows), or because of non-commercial project risk (e.g. political and institutional uncertainty and constraints). Projects characterized by high economic returns, but marginal financial returns, are good for the economy – but not necessarily attractive to private investors. These are likely to require public/private cooperation in some form – PPP -- including support from host governments and/or multilateral institutions. For example, urban mass transit systems – a rapidly increasing requirement in an urbanizing Asia – are generally not likely to be viable on a purely commercial basis given the large construction costs involved and uncertain demand; and therefore public sector support in some form is usually required, e.g. partial public financing (e.g. government financing of construction costs of the Singapore North-East Line and the Bangkok Metro); or full public financing even if private sector firms implement a system (e.g. Manila MRT2 and the Delhi Metro); government shouldering operating and revenue risks (e.g. Manila MRT3); or combining property/real estate-based financing with rail income to help provide sufficient revenue stream (e.g. Hong Kong MTR).

2. What is PPP

There is no generally agreed definition of PPP; it is used to refer to a wide range of mechanisms and structures where the private sector is involved in delivering public (infrastructure) services. These can range from traditional government procurement of limited private services, for example related to operations and maintenance of a service, through full privatization of traditionally publicly provided services and related state enterprises. As used here in the context of Asian infrastructure, PPP fundamentally “...refers to projects where the private sector’s returns are linked to service outcomes and the performance of the asset over the contract life”.9

From this perspective, at the heart of PPP are innovative financing mechanisms such as build-transfer-operate (BTO), build-operate-transfer (BOT), build-own-operate-transfer (BOOT). These provide a range of options for governments and private investors. In general, investors participate in PPP projects with the aim of achieving full recovery of their investment and earning a reasonable return. Basic to all PPP is the application of project finance principles. The revenue generating potential of the project, or project cash flow, is the fundamental basis for financing. A PPP project is then a pyramid of contracts defining roles, obligations, relationships, and expected returns for the various participants. The viability of a project depends ultimately on the integrity of such contracts, and therefore the supporting legal framework. An example of a typical project structure is illustrated in Figure 1 for a power generation PPP project.

Fundamentally, PPP is then a contractual agreement between the public and private sectors, where a private operator provides specified services traditionally supplied by public institutions; there is a clearly defined sharing of risks between government and the private sector; and the private participant receives payments linked to mutually agreed performance standards. The quality of the output of PPP projects is to be ensured by appropriate control mechanisms exercised by government in the public interest.10 A key difference between PPP and publicly provided services is that government can transfer key project risks to the private sector; a well designed PPP allows the efficient allocation of risk to the party best suited to control or manage it at the least cost. Therefore identifying and agreeing on an appropriate risk transfer from the government to the private sector is fundamental to getting the full benefit from private financing and/or a change in management responsibility in a PPP project.

Given the above, the challenges of PPP to government include (i) the generally
Investment in large-scale mega-projects is especially important in shaping national development since these involve significant expenditures and long-term, hard-to-reverse commitments and impacts that shape the socio-economy, perhaps in ways not anticipated with such investment commitments are undertaken.

Higher cost (as compared with government borrowing), in terms of the returns on equity and debt financing demanded by investors, as a kind of risk premium; (ii) usually lengthier and more complex project preparation process where the various roles, obligations, and returns are negotiated; (iii) constraints on the project sponsor’s flexibility, e.g. with respect to changing key parameters such as price of the service; and (iv) limits on the government’s ability to change the business environment for project (e.g. initiating new projects that may impact on a given PPP project’s revenue generating capacity and viability).

IV. Public Investment Framework for PPP Projects

1. Role of public investment planning

As noted, the basic reason for private investment in infrastructure in Asia is to better serve the public interest in the provision of such services, in order to support economic growth and development. Private participation through PPP is then intended to replace government in what has traditionally involved the public provision of such services. If, as suggested here, an effective public investment framework is essential to provide the foundations for a successful PPP strategy, then it is important to briefly highlight the general role and rationale for such a framework, starting with a brief definition of what is public investment.

Public investment generally refers to capital projects that make claims on public resources and whose productive life extends into the future. It includes both physical infrastructure, e.g. airport, port, urban rapid transit systems; and social infrastructure, e.g. health and education. Types of public investment can range from small, one-off, limited expenditures, implemented in a short period of time (e.g. 1 year), such as a road extension to large-scale mega-projects whose implementation and productive life extend over several years, even decades in the future, such as an urban mass transit system. Investment in large-scale mega-projects, of particular interest here, is especially important in shaping national development since these involve significant expenditures and long-term, hard-to-reverse commitments and impacts that shape the socio-economy often in ways that are not anticipated when such investment commitments are undertaken. For example, selection of a particular concept, design, and location for an urban mass transit system will have far-reaching and economic, social and environmental impacts.

Public investment therefore plays a critical role in shaping a country’s growth and development. It also represents significant long-term resource commitments and thus fiscal risks in an uncertain future environment. Without a realistic and systematic assessment of overall public investment commitments and of the quality of individual (i.e. mega) projects, neither the expected development impact of investments, nor the fiscal discipline necessary for managing societal resources in a sustainable manner over the long-term may materialize. Therefore the rationale for an effective framework for public investment planning includes the following:

- Ensuring alignment of a country’s development strategy and policy priorities with resource allocations, e.g. through the budget;
- Long-term preservation of national wealth through appropriate investments, particularly in light of potential future revenue uncertainties; and
- Increasing the social returns from long-lived assets by strengthening the quality and efficiency of individual projects, and the overall portfolio of public investment.

An effective public investment framework provides the means for selecting in a systematic and coordinated manner investment projects involving public resources on the basis of expected contribution to development priorities. It allows for:

- Vertical coordination: linking investments “up” to policy priorities, and “down” to annual budget allocations;
- Horizontal coordination: identifying tradeoffs and ensuring consistency and coordination among investment projects; and
Given the potentially significant public resource implications and development impacts of large-scale mega-projects, it is important to assess such proposed investments from a broader public interest perspective.

At the individual project level: strengthening effectiveness and efficiency in project selection, design, and management - particularly for large infrastructure projects that commit significant resources and have hard-to-reverse societal impacts.

2. Public Investment Framework for PPP project selection

Given the potentially significant public resource implications and development impacts of large-scale mega-projects, whether publicly or privately initiated, it is important to assess such proposed investments from a broader public interest perspective. In the case of PPP, this is essential in order to ensure that private participation is consistent with the public interest.

Role of macro-economic and fiscal framework: The key first-level challenge in public finance that defines the context for PPP, is determining the size of the overall government fiscal ceiling. This involves taking into account macro-economic forecasts and projected government revenues over the medium term, multi-year forecast of current policies and expenditures and levels of public service. Therefore reliable macroeconomic and fiscal framework and projections are the starting point for estimating an overall public expenditure ceiling for the medium term, and the foundations for spending ceilings for ministries and implementing agencies, including PPP project sponsors. The overall public expenditure envelope then sets the boundaries for the selection of public investment projects and/or projects with claims on public resources. This is often further subdivided into sub-ceilings for sectors (e.g. transport, health, education) and/or selected strategic issues (e.g. “economic diversification”) that reflect government policy priorities.

Korea provides an example of the application of a macro-economic and fiscal framework (Fig. 2) as the basis for public investment planning and related strategic budgeting.

Many studies have shown that decisions at the concept and initial design stage have the greatest influence on a project’s likelihood of success and on its actual socio-economic and environmental impacts.

A 3-stage project appraisal and selection process for specific PPP mega-projects, within the overall public expenditure ceiling, then includes the following:

- Stage 1 - project concept assessment: Mega-projects have a very uneven track record, experiencing significant implementation problems, whether undertaken by government, private sector, or as public-private partnerships. A wide range of studies have shown that decisions at the concept and initial design stage, at the “front-end”, have the greatest influence on a project’s likelihood of success and on its actual socio-economic and environmental impacts. Inadequate appraisal and preparation at the concept stage are the primary cause of significant mega-project implementation problems (e.g. underestimation of cost and risk factors, and overestimation of expected benefits), the emergence of unexpected negative impacts (e.g. economic, social, and environmental), and more fundamentally, the selection of the wrong projects to address perceived problems (i.e. inappropriate project outputs even when they meet expected budget and schedule targets). As a consequence, in countries with well-developed public investment preparation systems increasing emphasis is placed on assessment at the front-end (e.g. Korea’s pre-feasibility studies of mega-project proposals; UK’s Office of Government Commerce (OOC) “Gateway 0” analysis; the 1st stage of Norway’s 2-stage Quality Assurance (QA)) framework prior to deciding whether to move to a detailed design stage and financing of the project).

The focus of assessment at the front-end is to minimize the likelihood that the choice of the project concept turns out to be the wrong one in terms of its development impact or implementation requirements. This 1st stage, often involving extensive stakeholder engagement, is intended to identify projects that should be given priority based on sound public investment considerations – e.g. consistency with policy priorities, needs assessment, economic, social and environmental impacts, as well as consideration of alternatives.

- Stage 2 – design, detailed appraisal and “public sector comparator”: Projects that pass the 1st-level
Projects that pass the project concept assessment are then subjected to more formal appraisal, involving a detailed and comprehensive assessment of relevant macro, sectoral, and project-specific factors. This often includes economic assessment beyond traditional benefit-cost analysis, e.g. network implications, impact on geographic diversification, initiation of new economic activities; social impact assessment, including identification of stakeholder groups who are expected to benefit from the project, and those who may be adversely affected by the project, as well as the necessity of measures to mitigate or compensate for adverse impacts; environmental assessment; risk and uncertainty assessment over the life of the project, including factors such as potential resource constraints, changes in input and output prices; benchmarking against similar projects to assess implementation realism. Even if the decision is to implement the project as a PPP, this appraisal -- as if the project were undertaken as public investment, called a public sector comparator -- provides a benchmark for assessing PPP options. It therefore provides the basis for reflecting clearly the efficiency gains from private participation; including higher private sector borrowing costs, and the costs to be borne by the government under PPP.

- **Stage 3 - project delivery**: Once there is a clear understanding of the relative priority of the project concept (stage 1), and the projected cost structure and expected multi-dimensional impacts of the selected project design (stage 2), the basis is there to consider whether the project should be delivered through traditional public investment or as some form of PPP. Furthermore, at the next level of analysis, it is then possible to assess various specific options for project structuring, and select the most appropriate form of overall PPP for the particular infrastructure service (e.g. BTO, BOT, BOO); determine the best “owner” for each project component (structuring of roles and responsibilities of the private and public partners – the pyramid of contracts); and assess and account for life-cycle claims of the project on public resources, with particular attention to contingent liabilities, such as government guarantees (see section 3) arising from the proposed allocation of risks (see section 2). It is likely that as a detailed PPP project design is proposed at this stage, some or all of the stage 2 appraisals may need to be repeated as the specific design of the proposed project may change from that considered earlier under the public sector comparator in stage 2.

By putting in place a framework for public investment planning that includes the above general elements, there is a higher likelihood of PPP projects that serve the public interest.

**Example of Korea’s PPP selection process**: Korea begins with an explicit definition of the 47 types of infrastructure projects in 15 categories that are eligible for PPP (called “Private Participation in Infrastructure”, or PPI). The Korean government then assesses all potential PPP projects from a public interest perspective. However, it recognizes that projects of developmental importance may be initiated either by government or by the private sector; therefore making a distinction between “solicited” and “unsolicited” PPP projects. Solicited projects are ones identified as a priority by a public agency, e.g. central or local government, who then requests proposals from the private sector. In the case of unsolicited projects the private sector initiates a project concept and requests PPP designation for it from a public agency; a concessionaire is then selected under a competitive bidding process, though the initiator of the project concept may be given extra points in the bid evaluation. The 3 stages of the PPP selection process include the following: (1) pre-feasibility study informs the basic decision whether to undertake the project at all; (2) if yes, a detailed value-for-money assessment is the basis for the decision whether to implement the project as a PPP, using as a
Perception, allocation, and management of risk affects how a project is designed and managed, its total cost structure, revenue generating capacity, or even whether it will be implemented at all, i.e. whether private investors see an acceptable risk-reward tradeoff.

Example from Norway: Norway also has an interesting approach to the appraisal and selection of mega-projects (whose total budget exceeds 60 million euro), called the “quality-at-entry” regime, involving a 2-stage quality assurance (QA) appraisal. It puts an emphasis on assessment of the project concept at the “front end”, as noted, the critical stage in the project cycle. The first stage assessment, QA1, is called the (pre)feasibility stage, and focuses on the choice of project concept, including alternatives. If the project concept passes the QA1 appraisal, the second stage, QA2, known as the basic design/engineering or pre-project phase, addresses the details of the chosen project design. If the proposed design passes QA2, the project may enter the budget process, but with no guarantee that it will actually be selected (i.e. by the political decision process) as a priority project for financing and implementation, which will depend on comparison with other projects within the overall budget ceiling. (Figure 3)

2. Allocation of risks

Basic to all PPP is that project cash flow, or the revenue generating potential of the project, is the fundamental basis for financing. In this context, the central issue in project design then is the allocation of risks – in the case of PPP between government and private participants. This has a direct impact on project costs and revenues, and therefore investor returns. To assure investors of a reliable cash flow, governments often shoulder certain project risks (e.g. performance and financial guarantees; off-take agreements such as “take or pay”); use national resources to offset private risk (e.g. real estate or resource concessions); or introduce or relax legislative measures (e.g. zoning ordinances) to facilitate project completion or operations. For example, PPP contracts may provide for minimum revenue guarantees that limit the private operator’s exposure to demand risk, particularly when such demand may be influenced by public policy (e.g. on pricing) or possible future public investment (e.g. in potentially competing projects).

If government accepts more risks in this way, the cost – as the return on equity and debt demanded by private investors – may go down. If, however, the private sector has to take more of the risks (e.g. uncertain ridership on a rapid transit system; or fluctuating power demand), then costs in terms of the returns demanded by private investors are likely to increase. Therefore perception, allocation, and management of risk affects how a project is designed and managed, its total cost structure, revenue generating capacity, or even whether it will be implemented at all (i.e. whether private investors see an acceptable risk-reward tradeoff). A badly designed PPP may therefore result in a much larger risk exposure and related financial obligations for the government because of the long-term contractual agreements it generally involves.

Korean government’s risk sharing strategy for PPP: The Korean government introduced a Minimum Revenue Guarantee (MRGs) for both solicited and unsolicited PPP projects. Government guaranteed payment to private investors if revenue fell below a certain level of performance (e.g. a mutually agreed expected ridership for a mass transit system or toll road) – with different scales for solicited and unsolicited projects. Because of criticism that government took too much of the risk and provided unusually high returns to private investors, and a perceived risk of moral hazard of private operators not trying their best to increase project revenues, the MRG scheme was abolished in 2006 for unsolicited projects, and in 2009 for solicited projects. However, in order to continue to strengthen PPP project structure and performance, a new risk-sharing system was implemented. The government now pays the amount of shortfall when the
When government shoulders certain project risks on entering into PPP arrangements -- such as performance guarantees, off-take agreements, or resource concessions – it incurs contingent liabilities. These should be reflected in the public financial system.

3. Accounting for hidden costs: contingent liabilities

When government shoulders certain project risks on entering into PPP arrangements -- such as performance guarantees, off-take agreements, or resource concessions – it incurs contingent liabilities. These represent potential hidden costs that government will have to pay if a particular event occurs, for example guarantee of payment if use of a mass transit system is less than a mutually agreed threshold, or if actual power use falls short of projected demand in a take-or-pay agreement. These very real risks to government budgets and societal resources are often not recognized as public financial liabilities, even though the related investment projects may make potentially significant claims on public resources well into the future.

- Example - government guarantees: Government guarantees are a common feature of PPPs, and can be an effective form of government support for infrastructure investment when government is best placed to manage risk. Government then shields the private sector from risks that it cannot fully anticipate and control, as in the Korean case. A loan or performance guarantee legally binds the government to make payments to private investors should a clearly specified uncertain event materialize that impacts on the revenue generating capacity and/or cost structure of a PPP project, e.g. shortfall in ridership for a mass transit system. However, given the uncertainty of the event, e.g. demand patterns for new urban mass transit service, it is not clear whether and/or when the government will have to use public resources to meet such guarantees. Such government guarantees can have potentially significant multi-year fiscal consequences, particularly during uncertain economic times; exposing governments to higher costs than traditional public finance. Yet such guarantees are usually not subject to the same level of scrutiny through the budget process as regular expenditures.

- Korean case: As noted, Korea has a risk sharing system to facilitate PPP, a variation on minimum revenue guarantees. However, the resulting contingent liabilities are not presented as part of the budget and are not publicly available. Therefore it is not clear to whether and/or to what extent the government accounts for such potential claims on the public budget. Contingent liabilities such as performance guarantees provided by governments, should be reflected in the public financial system, for example in a Statement of Contingent Liabilities as part of the budget documentation, (suggested by the IMF).

This transparency would allow for a greater scrutiny and management of the often implicit claims of PPP on public resources and on the government budget.

V. Concluding Comments: Institutional arrangements for PPP

An effective public investment framework is more likely to lead to successful private participation in the provision of (large scale or mega) projects through PPP, in terms of generating value improvements for society. It will subject proposed PPP initiatives to more rigorous public scrutiny; ensure that they use societal resources in ways consistent with development priorities; and account more accurately for public resource commitments.

A key requirement in the implementation of an effective PPP strategy is appropriate institutional design. Experience has shown that a dedicated PPP unit is important to ensure the capacity to create, support, and evaluate public-private partnership agreements by government. However, reflecting the basic message of this note, it is essential that there exist a close, ongoing and credible institutional linkage between public investment planning and
PPP in order to make certain that a public interest perspective informs all PPP project decisions. Unless such an institutional linkage is in place, there is a risk that a dedicated PPP agency becomes primarily an advocate of private sector participation in infrastructure projects irrespective of the public resource implications and societal impacts.

- **Example – Korea’s PIMAC:** Korea’s Public and Private Infrastructure Investment Management Center (PIMAC) was established as an independent public agency within the Korean Development Institute (KDI) in 2005 under the PPP Act. PIMAC acts as the PPP unit: it provides technical support to line agencies and reviews the documentation submitted by such agencies for approval by the PPI Project Committee, chaired by the Ministry of Strategy and Finance. PIMAC therefore assesses all large-scale infrastructure investment projects, and recommends whether a project should be considered for PPP designation. Unifying the appraisal of all major investment projects in this way in an independent public agency makes it more likely that (i) value-for-money and investment criteria are applied to PPP; (ii) major projects are aligned; and (iii) perception that the PPP unit is biased towards private sector participation in infrastructure is reduced or eliminated.
Table 1: Fiscal Stimulus Packages in East Asian Countries, Impact on Government Budgets, and Infrastructure’s Share of the Fiscal Stimulus

<table>
<thead>
<tr>
<th>Country</th>
<th>Fiscal Stimulus in US$ (billions)*</th>
<th>Stimulus as a Percentage of 2008 GDP*</th>
<th>Fiscal Deficit as Percentage of 2009 GDP@</th>
<th>Infrastructure Share of the Fiscal Stimulus#</th>
</tr>
</thead>
<tbody>
<tr>
<td>China (PRC)</td>
<td>585.0</td>
<td>13.3</td>
<td>(3.3)</td>
<td>45.8%</td>
</tr>
<tr>
<td>Indonesia</td>
<td>61.0</td>
<td>1.2</td>
<td>(2.4)</td>
<td>16.9%</td>
</tr>
<tr>
<td>Korea (ROK)</td>
<td>84.0</td>
<td>8.9</td>
<td>(2.5)</td>
<td>29%</td>
</tr>
<tr>
<td>Malaysia</td>
<td>18.1</td>
<td>8.1</td>
<td>(7.8)</td>
<td>8.5%</td>
</tr>
<tr>
<td>Philippines</td>
<td>6.5</td>
<td>3.9</td>
<td>(3.8)</td>
<td>n.a.</td>
</tr>
<tr>
<td>Thailand</td>
<td>3.3</td>
<td>1.2</td>
<td>(4.2)</td>
<td>65.5%</td>
</tr>
<tr>
<td>Vietnam</td>
<td>1.0</td>
<td>1.1</td>
<td>(9.4)</td>
<td>60%</td>
</tr>
</tbody>
</table>

Sources: * from Table 4 and Table 7, Abidin (2010); @ from Table 2, World Bank (2009); # from Table 1, Bhattacharyay (2010)

Figure 1. Typical Project Structure for an Independent Power Producer (IPP)

Source: Fig. 1, p. 36, Esty (2003)
Figure 2. Korea’s Five-Year National Fiscal Management Plan
(MoSF: Ministry of Strategy and Finance)

Source: Koh (2009) 18

Figure 3. Norway’s “Front End” Appraisal of Mega-Projects

Endnotes


3 ADB (2009); see also Bhattacharyay (2010).

4 World Bank: *Thailand at a glance, 2/25/11; Malaysia at a glance, 2/25/11; Philippines at a glance, 2/25/11*


6 Institute of International Finance, various. It should be noted that reserves of Asian countries, particularly China, vary; e.g. China’s reserves at the end of 2010 are reported by Bloomberg (11 January 2011) at $2.85 trillion.

7 Ibid

8 ADB staff estimates (interviews).


10 This raises a 2-level principal-agent problem implicit in PPP: the private sector is the agent of government in implementing an infrastructure project; and more broadly, government is the agent of society representing or guarding the public interest.


15 See for example Akitoby et al (2007)


