Risk Mitigation Strategy for Infrastructure Projects

Submitted by: Peru
Risk Mitigation Strategy for Infrastructure Projects

1. Concession-based Model and Infrastructure Gap
2. Investment Trends
3. Concession-based Model and Risk Allocation
4. Risk Mitigation Instruments
Emerging economies need investment to meet infrastructure requirements, whether because of sub-optimal use of existing facilities or difficulty in meeting current and future demand. This is known as the "infrastructure gap".

Fitch Ratings, in its Latin America report, holds that, due to lack of funds, almost everybody agrees that the private sector must play a more prominent role in infrastructure development together with the Public Sector.

FDI is progressively recognized as the economic driving force which also enables global integration (OECD, 1998).

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Concession-Based Model and the Infrastructure Gap

- Due to the substantial infrastructure gap, emerging countries have come up with a Concession-based Model applied to large scale infrastructure. It consists of a Global and Complex Concession Contract that contains the identification, allocation and mitigation of a series of risks and responsibilities between the State, the private investor and the users.

- These Concession Contracts are of such financial and risk complexity and magnitude that the infrastructure concession market now concentrates a relatively small number of multinational participants with significant financial means and capable of accepting substantial risks (Trujillo, J. 2005).
The aforementioned Concession-based Model faces 2 problems:

1. Investment Promotion Agencies (IPAs) in the promotion process must take into account procedures to prevent the bidders from creating a cartel.

2. Local investors are unable to compete against multinational corporations. However, they have formed mutual benefit alliances that prepare them to assume larger challenges in the future.

Notwithstanding the problems above, emerging countries support their Concession-based Model to prevent the lack of infrastructure from becoming a bottleneck or a constraint to achieve their ever greater need for sustainable development.

Strategy for Risk Mitigation in Infrastructure Projects

1. Concession-based Model and Infrastructure Gap

2. Investment Trends
Private investment accounted for 50% or more of total investment in most countries...

- Private investment’s share is less than 60% only in Brazil (52%) and Colombia (33%).

But high private investment is (mainly) explained by the fall in public investment

- Private Investment: ~ 1% of the GDP (except Chile: 3.4%)
- Public Investment: 3% of the 80s GDP and less than 1%, except Colombia (3%) and Chile (1.8%)

Source: World Bank’s calculation based on data from Calderon and Serven (2008)
Electricity and land transport are most affected by falling total investments

- 50% to 70% reductions in transport and energy
- Telecom’s investment almost doubled; there was no change regarding water

Source: World Bank’s calculation based on data from Calderon and Serven (2008)

From all total private investments, telecommunications ranks first, followed by electricity and transport

- But there are big difference among countries: for example, in Argentina and Peru 40-60% of water investment is private

Source: World Bank’s calculation based on data from Calderon and Serven (2008)
Need for investments is substantial, especially in electricity and transport (% of annual GDP)

<table>
<thead>
<tr>
<th></th>
<th>Telecomms</th>
<th>Electricity</th>
<th>Transport</th>
<th>Water and Sanitation</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Latin America &amp; Caribbean</td>
<td>0.6</td>
<td>2.0</td>
<td>1.5</td>
<td>0.4</td>
<td>4.4</td>
</tr>
<tr>
<td>East Asia &amp; Pacific</td>
<td>0.4</td>
<td>3.2</td>
<td>1.7</td>
<td>0.5</td>
<td>5.9</td>
</tr>
<tr>
<td>Lower Middle Income Countries</td>
<td>0.7</td>
<td>4.2</td>
<td>2.7</td>
<td>0.6</td>
<td>8.2</td>
</tr>
<tr>
<td>Upper Middle Income Countries</td>
<td>0.2</td>
<td>1.0</td>
<td>0.9</td>
<td>0.1</td>
<td>2.3</td>
</tr>
<tr>
<td>Maintenance (% of global investment)</td>
<td>67%</td>
<td>50%</td>
<td>78%</td>
<td>43%</td>
<td>62%</td>
</tr>
</tbody>
</table>

Investments of 4.4% of GDP to ensure global coverage of basic and to satisfy consumers and producers demands in the 2008-2015 period

- Higher investment in electricity and transport is required

Source: Yepes (2007)

Infrastructure Stock: LAC behind middle income countries in transport and electricity

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Latin America and Caribbean</td>
<td>73</td>
<td>84</td>
<td>3</td>
<td>91</td>
<td>77</td>
</tr>
<tr>
<td>East Asia &amp; Pacific</td>
<td>58</td>
<td>61</td>
<td>13</td>
<td>79</td>
<td>51</td>
</tr>
<tr>
<td>Middle Income Countries</td>
<td>66</td>
<td>90</td>
<td>6</td>
<td>84</td>
<td>62</td>
</tr>
<tr>
<td>High Income Countries</td>
<td>143</td>
<td>100</td>
<td>11</td>
<td>99</td>
<td>100</td>
</tr>
</tbody>
</table>

- LAC surpassed the Asian Southeast regarding access to “improved” telephones, water and sanitation facilities.
- But the region still is behind middle income countries regarding access to electricity and roads

Source: World Development Indicators and Global Monitoring Report 2006
Changes in sector composition of similar investments in LAC and the rest of the world

- Telecommunications participation falls
- Increase in energy and transport, no change regarding water


More greenfield projects with government guarantees: less appetite for risk?

- Projects with no governmental guarantees have decreased from 76% to 34% in LAC; from 60% to 45% in the rest of the world.

However, the number of failed private-participation projects is low

- Most failures occurred in the Water sector, while few occurred in the Telecommunications sector
- After 1995, failed investments are less than 5%


Strategy to for Risk Mitigation in Infrastructure Projects

1. Concession-Based Model and Infrastructure Gap
2. Investment Trends
3. Concession-Based Model and Risk Allocation
Based on the PPP cycle

1. Set PPP Policy & Strategy
2. Project Identification/Origination
3. Analysis of Individual Projects
4. Transaction Management
5. Contract Management, Monitoring and Enforcement And Impact Evaluation

- Technically feasible?
- Financially attractive for potential private sector partners?
- Affordable for public sector?
- Value for money?
- Appropriate risk transfer?

Ensure that both public and private partners meet terms of contract

Risk Mitigation Instruments

- Risk Assignment Models between the Public Sector, Investors and Users determine the financing alternatives.

- The Risks that affect Concession Contracts fall into four categories:

<table>
<thead>
<tr>
<th>Political risks</th>
<th>Regulatory risks</th>
<th>Financial risks</th>
<th>Risks inherent to the project</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Social instability, terrorism, war</td>
<td>• Unstable legal environment</td>
<td>• Inflation</td>
<td>• Construction</td>
</tr>
<tr>
<td>• Expropriation, nationalization</td>
<td>• Modification to fee determination</td>
<td>• Interest rates</td>
<td>• Operative</td>
</tr>
<tr>
<td>• Loss of currency convertibility</td>
<td>• Increase of investment obligations</td>
<td>• Exchange rates</td>
<td>• Service demand</td>
</tr>
</tbody>
</table>

Fuente: Trujillo, J. 2005
- **Political risks**: Coverage by private guarantors is unlikely. Coverage usually comes from multilateral organizations. These risks are not deemed as important by local investors.

- **Regulatory risks**: These risks cannot be covered in the market, as they are similar to the Political Risks. Mitigating them is possible provided that regulatory organizations exercise economic and administrative autonomy.

- **Financial risks**: They are related to the macroeconomic environment and can be mitigated in the market or by the Concession Contract structure.

- **Project risks**: They can also be mitigated by the market and the Concession Contract structure.

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### Allocation Trends

<table>
<thead>
<tr>
<th>Type of Risk</th>
<th>Appointed Agent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planning and conceptual design risk</td>
<td>State</td>
</tr>
<tr>
<td>Financial risks</td>
<td>Concessionaire Company / State</td>
</tr>
<tr>
<td>Traffic and income risks</td>
<td>Concessionaire Company / State</td>
</tr>
<tr>
<td>Engineering and construction</td>
<td>Concessionaire Company through its Consulting and Construction and Equipment Companies</td>
</tr>
<tr>
<td>Operation and maintenance</td>
<td>Concessionaire Company through its Operator Company</td>
</tr>
<tr>
<td>Technology risk</td>
<td>Concessionaire Company through its technology supplier company</td>
</tr>
<tr>
<td>Regulation and legislation risk</td>
<td>State / Concessionaire</td>
</tr>
<tr>
<td>Force majeure risk</td>
<td>State</td>
</tr>
</tbody>
</table>
In short...

It is not possible to completely identify all the risks that can affect a project throughout its life and, on the other hand, not all these risks can be assessed. And that is because there is no market in which all risks can be covered. It is also not possible to quantify, ex-ante, the exact consequences associated to these risks (Ikons 2008).

Risk Assessment Methodologies:

A. Historic probabilities

B. Declared probabilities

C. Monte Carlo and Bootstrap
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Risk Mitigation Instruments

- Full coverage
- Partial coverage
- Debt risk (Credit risk)
- Equity (Investment risk)

Comprehensive risk

Risk Mitigation Instruments

- There is a growing interest in using Risk Mitigation Instruments in order to attract private capital.

- Risk Mitigation Instruments are financial instruments that transfer some risks of the projects to the entities with the appropriate conditions to manage them.

- The main objective of the public provision of a service is to ensure that taxpayers obtain Value for Money (VFM). To be precise, VFM is not only a direct measurement of the monetary cost of the services, it also considers a combination between clarity, cost, resources use, time and convenience. (Ikons 2008)

- The estimated income flows constitute the central hypothesis of the feasibility analysis of the projects and, regardless of the high margin of error, determine the main characteristics of concession-based contracts. (Trujillo, J. 2005)

- Risk premium derived from income uncertainty will be translated into higher terms and tariffs than those resulting from lower uncertainty levels.

- The result of uncertainty is the ignorance of the eventual cost of the infrastructure, for the users, taxpayers or both.

- The concessionaire’s expected profitability must respond to the risk the grantor decides to transfer to them due to efficiency reasons. Expecting a concessionaire to assume risks that it cannot manage will only lead to the distortion of the bidding award and to an increase in costs. (Trujillo, J. 2005).
Taking into consideration that the Global and Complex Concession Model is predominant in emerging countries, we can point out some Risk Mitigation Instruments:

A. Income Correction Mechanism:

- Establishes minimum and maximum income or demand that modify income calculation in order to keep real income within reasonable margins.
- Regarding tariffs paid by the users, correction can be established through compensations to the Public Sector.
- An alternative mechanism can be a stabilization fund of the concession's income. Regarding permanent surplus or deficit, there is the possibility to modify the structure and tariff levels.

B. Open-end Mechanisms:

- Relates the concession term to the variables subject to uncertainty, so it can adjust itself automatically.
- We have the Least Present Value of Revenues (LPVR), through which the concession is awarded to the bidder that presents the least present value of future revenues as concessionaire and which leads to an indefinite open-end term. This term will be concluded when at the stipulated discount rate, the present value of the concessionaire's revenues equals the resulting value of the promotion process.

Case: Chile’s and Great Britain's road-toll
Risk Mitigation Instruments

C. Commercial and Financial Risks Mitigation Mechanisms:

- Relates the concessions term to the completion of the financial obligations of the concessionaire. Under this form, the bidders should have presented proposals that include:
  a. Investment amount.
  b. A binding financial plan.
  c. Fee levels.
  d. Income percentage (toll) assigned to the financial plan.

- The concession is granted to the proposal that minimizes the present value of the expected cash flow for some traffic projections and a discount rate established by the investment promotion agency.

- The concession term ends when the concessionaire finishes the obligations that come from the financial plan.

Case: Concession of the divided highway Pamplona-Logroño promoted by the Foral government of Navarra under the shadow toll regime of 2002

Risk Mitigation Instruments

D. Autonomous Financing Mechanism:

- Under this mechanism the financial subjects are separated from the construction and exploitation activities, which requires the constitution of an ad hoc vehicle (promoted by the Public Sector) which can act as trusteeship, obtaining financing in the market by using the project’s flow given in guarantee, for the placement of securities or to obtain bank loans.

- Contracts separation must increase the competition, adequate the characteristics of each contract to the structure of the concession and facilitate the contractual elements’ flexibilities: fees, serviceability indexes and term; which reduces renegotiation risks.

Case: We can find more examples of infrastructures developed and managed through ‘unbundled’ procedures in the United States.
INTERNATIONAL EXPERIENCE IN RISK MITIGATION

Note: Higher risk fraction assigned to the private sector, higher proportion assigned to the public sector, risks mostly equally shared.

(a). All or most of the investment is done in local currency.

(b). Global evaluation of the risk assignation was obtained as opinion of the sponsors and/or advisors of each project.


EXAMPLES OF RISKS ASSIGNATION IN CONCESSION PROJECTS

<table>
<thead>
<tr>
<th>Country</th>
<th>Project</th>
<th>Pre-Construction</th>
<th>Construction</th>
<th>Traffic / Revenues</th>
<th>Exchange rate</th>
<th>Force Majeure (a)</th>
<th>Political (b)</th>
<th>Financial</th>
<th>Global public risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chile</td>
<td>South access to Concepcion</td>
<td>◯</td>
<td>◯</td>
<td>◯</td>
<td>None (b)</td>
<td>⊗</td>
<td>⊗</td>
<td>◯</td>
<td>Medium</td>
</tr>
<tr>
<td>Colombia</td>
<td>Freeway Buga – Tuluá</td>
<td>◯</td>
<td>○</td>
<td>◯</td>
<td>None (b)</td>
<td>⊗</td>
<td>⊗</td>
<td>◯</td>
<td>Medium</td>
</tr>
<tr>
<td>Mexico</td>
<td>Ciudad de México freeway – Toluca</td>
<td>None (securitization)</td>
<td>None (securitization)</td>
<td>◯</td>
<td>○</td>
<td>⊗</td>
<td>⊗</td>
<td>◯</td>
<td>Low</td>
</tr>
<tr>
<td>China</td>
<td>Guangzhou-Shenzhen freeway</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>⊗</td>
<td>⊗</td>
<td>⊗</td>
<td>High</td>
</tr>
<tr>
<td>Malaysia</td>
<td>North – south highway</td>
<td>◯</td>
<td>◯</td>
<td>□</td>
<td>None (b)</td>
<td>⊗</td>
<td>⊗</td>
<td>⊗</td>
<td>High</td>
</tr>
<tr>
<td>Hungary</td>
<td>Freeway M1/M15</td>
<td>◯</td>
<td>○</td>
<td>□</td>
<td>⊗</td>
<td>⊗</td>
<td>⊗</td>
<td>⊗</td>
<td>Low</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>Dartford bridge</td>
<td>□</td>
<td>◯</td>
<td>●</td>
<td>None (b)</td>
<td>⊗</td>
<td>⊗</td>
<td>◯</td>
<td>Low</td>
</tr>
<tr>
<td>USA</td>
<td>SR-91</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>None (b)</td>
<td>⊗</td>
<td>⊗</td>
<td>⊗</td>
<td>Low</td>
</tr>
</tbody>
</table>

Note: ◯ Higher risk fraction assigned to the private sector; ⊗ higher proportion assigned to the public sector, risks mostly equally shared.

(a). All or most of the investment is done in local currency.

(b). Global evaluation of the risk assignation was obtained as opinion of the sponsors and/or advisors of each project.

## EXAMPLES OF FINANCING STRUCTURE AND GUARANTEES GRANTED BY THE STATE IN CONCESSION PROJECTS

(Amounts in US$ million)

<table>
<thead>
<tr>
<th>COUNTRY</th>
<th>PROJECT</th>
<th>TOTAL DEBT</th>
<th>TOTAL CAPITAL</th>
<th>TOTAL INVESTMENT</th>
<th>DEBT/CAPITAL</th>
<th>FOREIGN PARTICIPATION</th>
<th>GOVERNMENTAL GUARANTEES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chile</td>
<td>South access to Concepcion</td>
<td>13</td>
<td>9</td>
<td>22</td>
<td>60/40</td>
<td>None</td>
<td>Cash collateral for US$5 million and minimum traffic guarantee</td>
</tr>
<tr>
<td>Colombia</td>
<td>Freeway Buga – Tuluá</td>
<td>15</td>
<td>16</td>
<td>31</td>
<td>50/50</td>
<td>Railway Capital (Spain)</td>
<td>Minimum traffic guarantee of 90% of the base scenario</td>
</tr>
<tr>
<td>Mexico</td>
<td>Ciudad de Mexico freeway–Toluca</td>
<td>313</td>
<td>0</td>
<td>313</td>
<td>100/0</td>
<td></td>
<td>Minimum traffic guarantee with compensation in term extension</td>
</tr>
<tr>
<td>China</td>
<td>Guangzhou-Shenzhen freeway</td>
<td>800</td>
<td>1122</td>
<td>1922</td>
<td>40/60</td>
<td>Railway Capital South</td>
<td>US$800 million in international bank loans, US$922 million in foreign capital</td>
</tr>
<tr>
<td>Malaysia</td>
<td>North – south highway</td>
<td>2416</td>
<td>775</td>
<td>3192</td>
<td>75/25</td>
<td>Syndicated international bank loan for US$70 million</td>
<td>Government credit for US$634 million, and soft credit mechanisms available to sustain minimum traffic levels and exchange fluctuations</td>
</tr>
<tr>
<td>Hungary</td>
<td>Freeway M1/M15</td>
<td>362</td>
<td>88</td>
<td>440</td>
<td>80/20</td>
<td>EBRD “A” syndicated bank loan for US$58 million, EBRD “B” syndicated bank loan for US$163 million, and US$808 million in foreign capital</td>
<td>None</td>
</tr>
<tr>
<td>UK</td>
<td>Dartford bridge</td>
<td>292</td>
<td>0.002</td>
<td>292</td>
<td>100/0</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>USA</td>
<td>SR-91</td>
<td>107</td>
<td>19</td>
<td>126</td>
<td>85/15</td>
<td>Cofinova capital (France)</td>
<td>Orange county Subordinated debt for US$7 million.</td>
</tr>
</tbody>
</table>