

# Developing Infrastructure via Project Financing (BOT/PFI/PPP): Concepts, Risks and Lessons

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# An Example

- A tunnel to be built to solve a traffic jam problem across a river in a city
- The government has no budget for it
- A contractor proposes to the government:
  - Be authorized to finance, design, build and operate the tunnel
  - Transfer to government after a certain period
- Everyone (government/developer/contractor/lender/operator/**user(?)**/etc.) are happy

# Please Consider .....

- Is the proposed method/vehicle (BOT) applicable?
- Able to secure enough financing and in time?
- The rights to collect tolls?
- Project structure and participants' role?
- How to allocate/share risks among participants? e.g.
  - Toll adjustable (for inflation, etc.)? and in which way?
  - Traffic volume enough?
  - Competitive bridge/tunnel allowed?
  - Foreign exchange, e.g. for imported equipment?
  - The creditworthiness of government & partners?
  - The capabilities and experience of contractor? .....

The above are key issues in BOT projects

# Agenda

- **BOT/PFI/PPP Concepts**
  - Definition, Pros and Cons
  - Application
- **Risk Management**
  - Unique/critical risks and mitigating measures
  - Risk model and risk management frameworks
- **Case Study**
  - Laibin B Power Plant (model project in PRC)
- **Lessons learnt and Remarks**



# BOT Definition

- Build-operate-transfer (BOT) requires the private sector to **finance, design, build, operate and manage** the facility and then **transfer** the asset free of charge to the government after a specified **concession period**.
- The concept has actually been in use for centuries but:
  - First coined in 1984 by Turkish PM Turgut Ozal within the framework of **privatization** of Turkish's **public projects**.
  - Captured the world's attention especially of **developing countries**, e.g. Turkey (Power, 1st), Philippine (Power, 1st successful), Malaysia (NS Highway), Thailand (LTR), PRC (Shajiao, 1st transferred; Laibin), HK (Tunnels), Australia (Tunnel), UK & France (Eurotunnel, the biggest)
- **Popular** financing method for **infrastructure**

# BOT Basic Forms

- BOT is a general term and has **3 basic forms** and dozens of **variant forms**
- The 3 basic forms:
  - **BOT** (Build-Operate-Transfer): **no ownership**
  - **BOOT** (Build-Own-Operate-Transfer): the Project Company has the **ownership** & BOT right -> lower price/tariff & longer concession period
  - **BOO** (Build-Own-Operate): **no transfer**, lowest price/tariff & longest concession period

# BOT Variant Forms

- BT (Build-Transfer)
- BOOST (Build-Own-Operate-Subsidy-Transfer)
- ROT (Rehabilitate-Operate-Transfer)
- BLT (Build-Lease-Transfer)
- ROMT (Rehabilitate-Operate-Maintain-Transfer)
- ROO (Rehabilitate-Own-Operate)
- TOT (Transfer-Operate-Transfer)
- SOT (Supply-Operate-Transfer)
- DBOT (Design-Build-Operate-Transfer)
- DOT (Develop-Operate-Transfer)
- OT (Operate-Transfer)
- OMT (Operate-Manage-Transfer)
- DBFO (Design-Build-Finance-Operate)
- DCMF (Design-Construct-Manage-Finance)

# Other General Terms Used

- PPP = Public Private Partnership
- PFI = Private Finance Initiative
- PSP = Private Sector Participation
- Privatisation
- .....

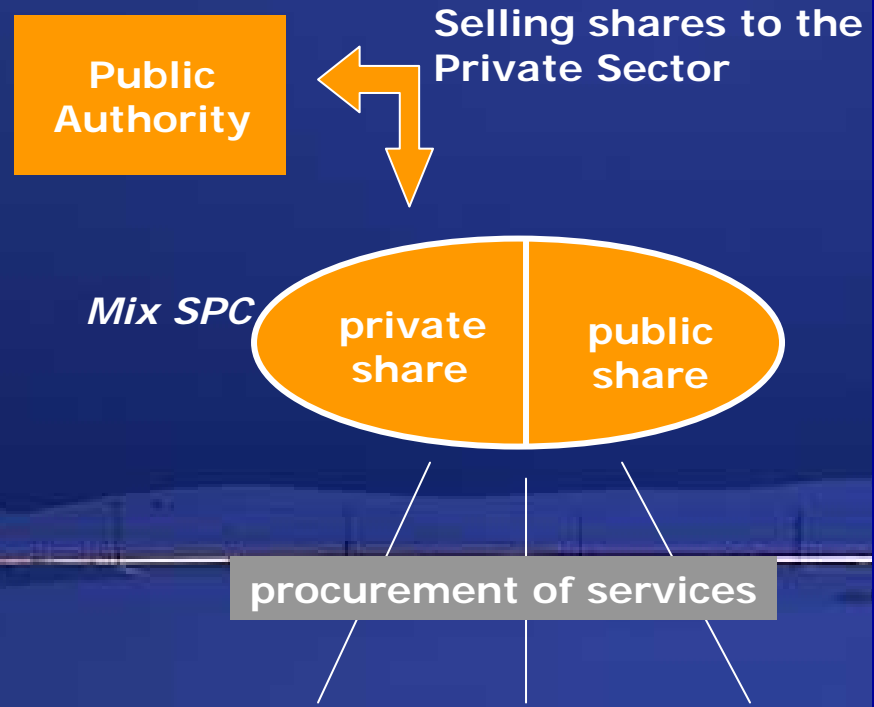
General terms used are:

- country specific
- not very precise
- sometimes even irritating

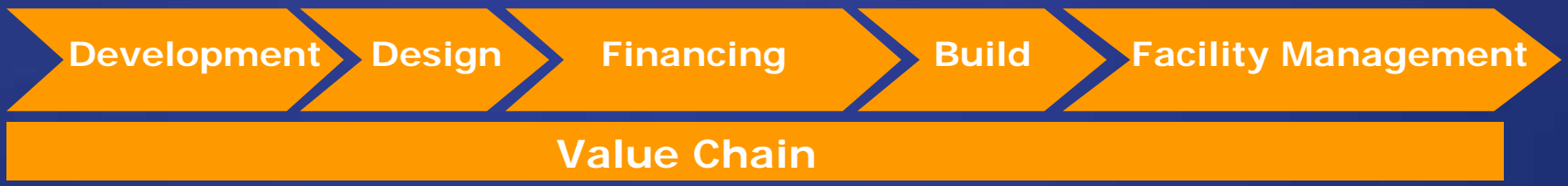
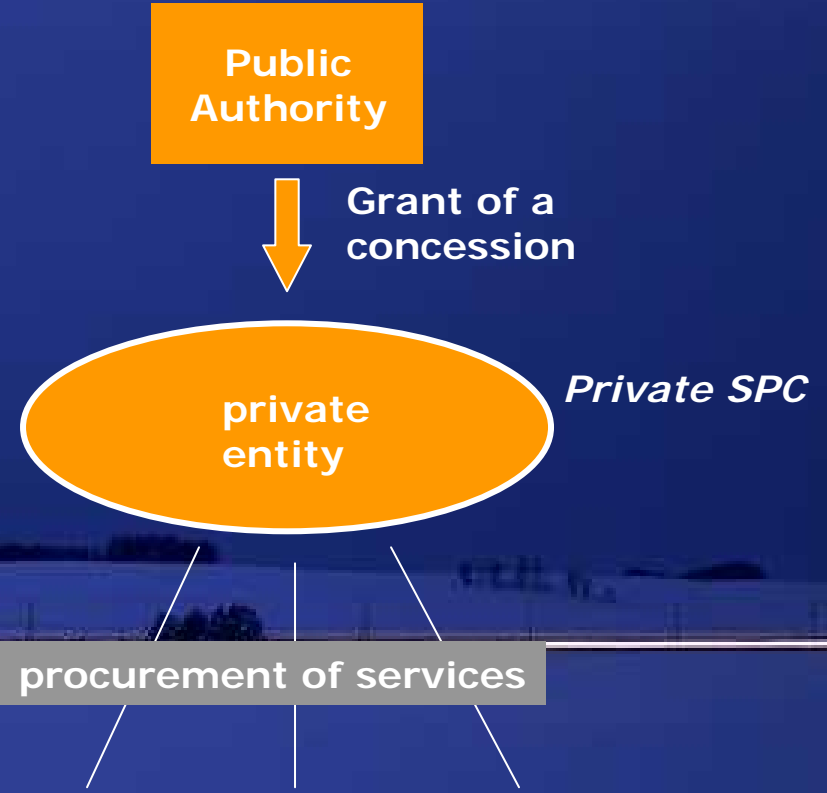
**But all are types of privatisation.**

# Principle Structures of BOT/PPP

## Horizontal Partnership



## Vertical Partnership



# BOT/PFI/PPP Nature

- BOT is with a kind of **Concessionary** (authorization):
  - Best applicable to **infrastructure/resource** projects
  - Government **authorizes** the private/foreign developers
  - Government owns the ultimate **ownership**
  - **Concession period** 10 to 30 years after which the facility transferred to government usually free of charge
- BOT is typical **Project Financing** (“finance through a project” instead of “finance for a project”)
  - Financing a project based on the **project’s future income**
  - **Limited/little recourse** or even no recourse to developers
  - Project’s income is the **only source** for debt (P+I) payment
- BOT is a kind of **Privatization**

# BOT/PFI/PPP Nature (con't)

- Financing based on **project's financial viability** instead of the developer's credit & asset
- **Higher debt/equity ratio** (usually debt>70%)
- **Middle to long** term debt
- **Complex** project/contract structure
- Huge investment (equity and debt)
- Higher financing cost
- **Project Company** instead of the developer **is** the direct **borrower** – separate the project company from developer
- **Many risks** involved
- Many **insurances/guarantees** needed

# Comparison of Traditional & BOT

- Traditional Financing
  - Contract awarded based on **cost**
  - Contractor's main risks include **completion, political and performance risks**
  - **Financing risk and revenue risk** are allocated to **government**
  - Financing is eventually covered by government bonds
- Project Financing (BOT)
  - Contract is awarded base on **lowest cost & shortest time** of transfer to government
  - Contractor/developer's main risks includes **financing, revenue and political risks + operational cost**
  - Contractor would gain benefit of an additional project that would have ~~not been forthcoming~~ under traditional financing
  - It is **user-based fee** that is more equitable
  - Helps government undertake more projects

# Privatization: Pros

- **Argument for Privatization (Pros):**
  - **Rationalization** of limited financial resources of government
  - User-based fee makes it more **equitable** from social point of view
  - Profit-motive makes it more **efficient** in construction and operation
  - Facilitate (hard/soft) **technology transfer**

# Privatization: Cons

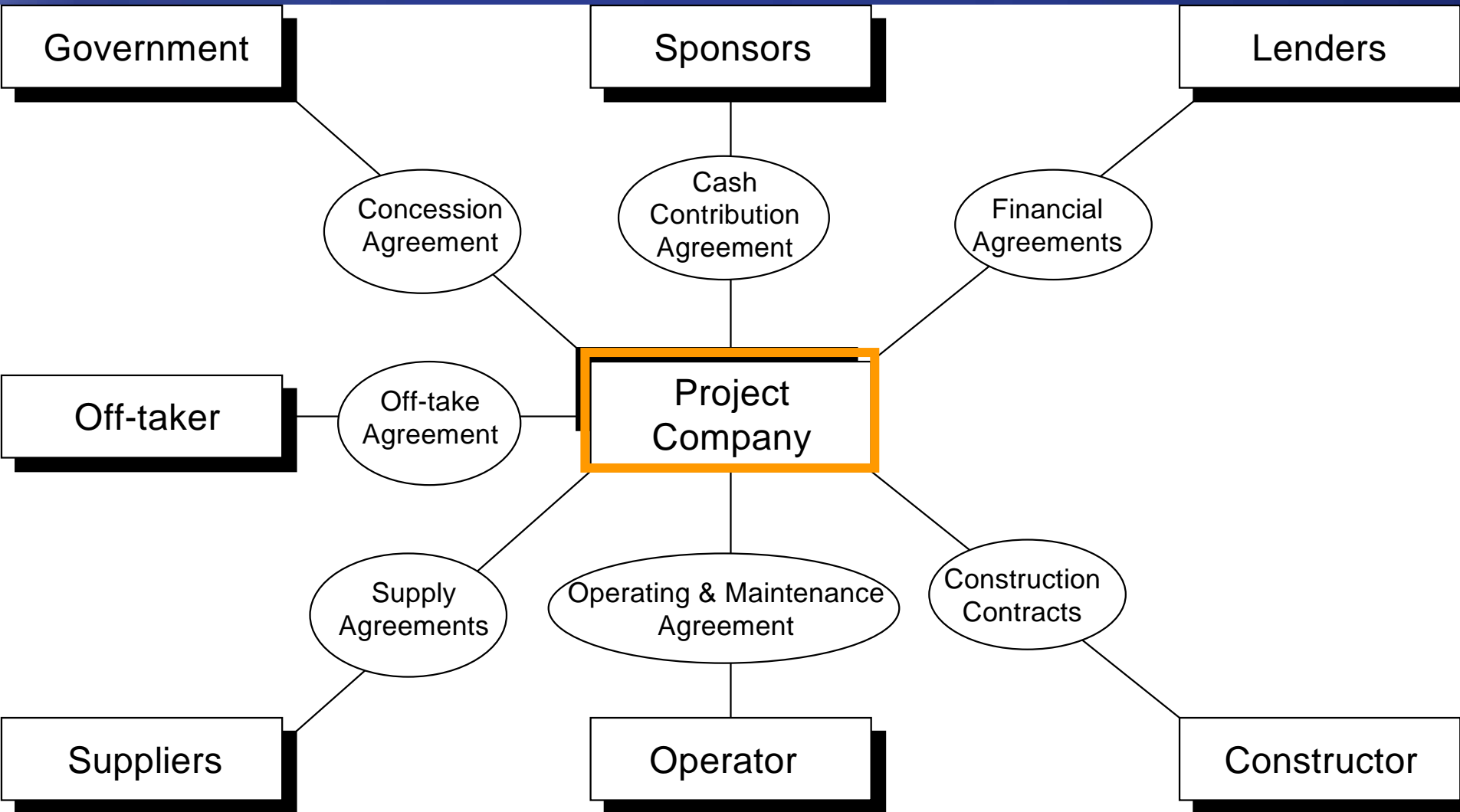
- **Draw Backs (Cons):**

- Issue of role of government in providing social overhead capital
- Maintenance and up-keep during operational level may not be adequate
- Since investment in infrastructure projects are lumpy, they may require concessions. That in turn may lead to development of monopoly

- **Need for Government Oversight:**

- Price and fees (tariff)
- Quality of service
- Adequacy of service

# BOT/PPP Project Structure, Parties and Contracts (detailed)



# Best Suit BOT Projects

Any projects but best suitable for natural **resource exploring, infrastructure projects**, e.g. (**in order of easy financing**):

- Mining/oil/gas/petrochemicals (product for export)
- Power, water, waste treatment (government off-takes)
- Telecommunications (high profit & international income)
- Road, tunnel, bridge (separate facilities)
- Mass transit e.g. rail, subway (relative stable)
- Airport, seaport (affected by international politics/economics)
- Mass manufacture, e.g. big ship, airplane.....

# Projects that Easy to Finance

- Income in hard currency, e.g. US\$, Euro, Japanese Yen
- High ratio of equipment cost in total investment (easy to get Export Credit), e.g. power plant
- Critical need for the project
- Reliable user/off-taker (e.g. government for power & water projects)
- Proven technology
- Relatively mature legal, tax, financial systems of the project country

# Bid Evaluation – Points Approach

- Evaluation criteria grouped into **price** and **non-price** factors
- **Points scored** on each factor and aggregate score of each bidder across all factors is compared
  - **highest score** wins
  - higher **weightings** can be assigned to price vs. non-price factors, depending on public sector priorities (e.g. which is more important: reliability or price?)

# Bid Evaluation – Hurdle Approach

- Evaluation criteria grouped into **price** and **non-price** factors
- Bidders evaluated on non-price proposal first
- **Failure** to meet minimum requirement on any **non-price** factor results in **elimination** of bidder
- Bidders who **pass** non-price hurdles then competitively evaluated on basis of **price**
- Assumes any bidder passing all non-price hurdles could develop project to satisfaction of public sector
- Then simply a case of identifying **best/lowest price**

# Critical Successful Factors (CSFs)

- Stable **political** environment of the project country
- Critical **need** for the project
- The project country government **allows** BOT
- Relatively **mature** legal system and enforcement
- Project is **financially viable**
- Developer's **technical** proposal is **feasible** and developer experienced
- Reasonable **risk allocation** through contract/structure
- Meet international **environmental** standards
- Participants with relevant **knowledge/experience**

# CSFs in Developing Countries

In addition to above, the followings are also important:

- **Government's supports/incentives**, e.g.:
  - Tax incentives, e.g. reduced/exempted income/custom taxes
  - Sovereign guarantee and foreign exchange guarantee
  - Take or pay off-take contract if applicable
  - Near-monopoly
  - Land and facilities
  - Supportive loan, equity or subordinate loan
- **Attractive financial proposal**:
  - Low construction cost
  - Acceptable debt/equity ratio
  - Attractive tariff (e.g. low power/water rate or toll)
    - Economics developed to a **certain level** – match with tariff
  - Short construction and concession periods
  - Accurate forecast of demand



# Principles for Risk Allocation

For fair allocation of risks:

- A party who has the **best control** over a risk should usually take the risk;
- A party who has the **most cost-efficiency** control over a risk should usually take the risk;
- The extent of risk taking should be **matched** with compensation/reward/profit;
- In addition:
  - All risks to be properly mitigated/allocated;
  - Long term objectives/relationship.

# Risk Allocation in General

- Project Company usually takes **financing, design, construction, procurement, operation and maintenance risks** (Project Company will transfer some risks to other participants, e.g. designer/contractor/supplier/operator/user etc)
- Government usually takes **political, change in law, foreign exchange risks**
- Both share **Force Majeure risks**

# Risks in BOT Projects by Sectors

Sector	Sector-Specific Risk
All Sectors	<ul style="list-style-type: none"> <li>• Force Majeure risk</li> <li>• Political risks (change in law &amp; regulation, revoke and expropriation)</li> <li>• Financial risks (inflation, interest rate, exchange rate &amp; convertibility)</li> <li>• Competition risk</li> <li>• Environmental risk (increasing consciousness in society)</li> <li>• Land acquisition and compensation risk</li> <li>• Construction risks (cost overrun, delay, quality)</li> <li>• Operation risk (operator inability, output quantity and quality, production regularity)</li> <li>• Condition of facility</li> <li>• Supply risk (shortage, quality)</li> <li>• Offtake risk (quantity and pay in time)</li> <li>• Documentation/contractual risk (conflict and arbitration, applied law)</li> </ul>
Power	<ul style="list-style-type: none"> <li>• Repayment of external debt</li> <li>• Restriction on imported equipment and raw materials</li> <li>• Fluctuating demand of power generated</li> <li>• Problem in bill collection</li> <li>• Illegal connection to the transmission system (power theft)</li> <li>• Transmission failure</li> <li>• Lowered tariffs due to competition</li> <li>• Specification not being fulfilled, resulting in the refusal of power purchase by state utility</li> <li>• Power plant location (inadequate transport facilities)</li> <li>• Environmental dispute</li> <li>• Fluctuate of cost and availability of fuel/coal</li> <li>• Construction delay</li> <li>• Prolonged downtime during operation</li> <li>• Liquidated damages or terminate of Power Purchase Agreement (output and quality do not meet off-taker's requirement)</li> <li>• Government's restrictions on the profitability (rate of return) and tariff levels</li> </ul>
Transport (Road)	<ul style="list-style-type: none"> <li>• Inadequate traffic volume (inadequate traffic forecasts or subsequent deviation)</li> <li>• Competing routes (particularly free or under-priced ones)</li> <li>• Restrictions on toll level and increase</li> <li>• Cost overruns (because of the size and scope, particularly if the project crosses a hilly region)</li> <li>• Construction delays (land acquisition, unexpected technical difficulty)</li> <li>• Long land acquisition period</li> <li>• Right-of-way disputes (e.g. archaeological mines)</li> <li>• Necessitating measures to minimize the impact of construction on the traveling public</li> <li>• Delay in other projects connecting to this road</li> <li>• Income streams are usually in local currency (Exchange Rate &amp; Convertibility risk)</li> </ul>

# Risks in BOT Projects by Sectors (con't)

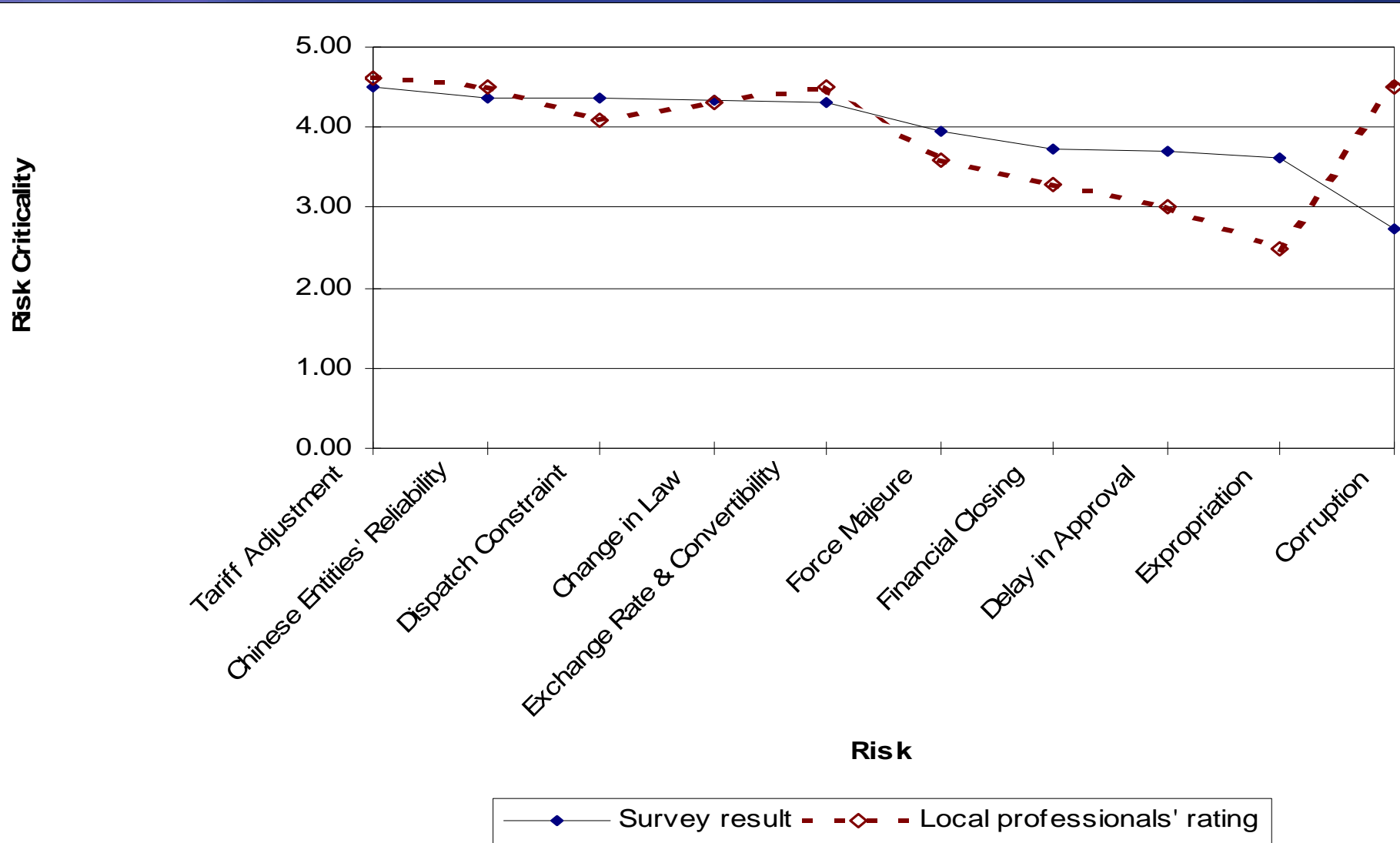
Sector	Sector-Specific Risk
Transport (Tunnel & Bridge)	<ul style="list-style-type: none"> <li>• Geological risks for immersed tunnel</li> <li>• Safety at work and disturbances to surface traffic in municipal areas</li> <li>• Health risks of compressed air</li> <li>• Stability of the seabed for submerged tunnel</li> <li>• Traffic accidents and fire break-outs for tunnels during operation</li> <li>• Restrictions to harbor navigation and air traffic flight path for bridge</li> <li>• Hydrological opposition from ferry workers, fishermen</li> <li>• Bad weather conditions</li> <li>• Competition from ferries &amp; airlines</li> </ul>
Transport (Rail)	<ul style="list-style-type: none"> <li>• Long land acquisition period</li> <li>• Complex relocation of existing utilities</li> <li>• Un-coordinated attempt in various districts</li> <li>• Controlled fare levels</li> <li>• Complexity of in getting design approvals</li> <li>• Competition from road transportation</li> <li>• Environmental dispute</li> <li>• Taxation</li> <li>• Expensive rolling stock and control systems</li> </ul>
Transport (Airport & Port)	<ul style="list-style-type: none"> <li>• Competition from other airports</li> <li>• Regional or international trade prosperity</li> <li>• Tourism business prosperity</li> <li>• Political stability and spending pattern</li> <li>• Integration with other connecting facilities</li> <li>• Inadequate adjoining land for expansion</li> <li>• Throughput capacity affected by the breakdown of equipment, labor disputes and extreme weather conditions for port</li> <li>• Economic and trade conditions</li> <li>• Changes in tariff regulations and quotas</li> <li>• Political risk</li> </ul>
Process Plant	<ul style="list-style-type: none"> <li>• Take-or-pay agreement with gas producer</li> <li>• Leakage of pipe</li> <li>• Non-payment and pilferage</li> <li>• Controlled tariffs</li> <li>• Fast changing environmental regulations for waste treatment (rising concerns and advancing technology making improvements possible)</li> </ul>
Telecommunication	<ul style="list-style-type: none"> <li>• Most competitive sector</li> <li>• High Research &amp; Development costs</li> <li>• Restrict from the incumbent operator for new entrants to access to established network</li> <li>• Addition cost and problem in integrating with existing network including technological incompatibility</li> <li>• Bureaucracy in licensing</li> </ul>



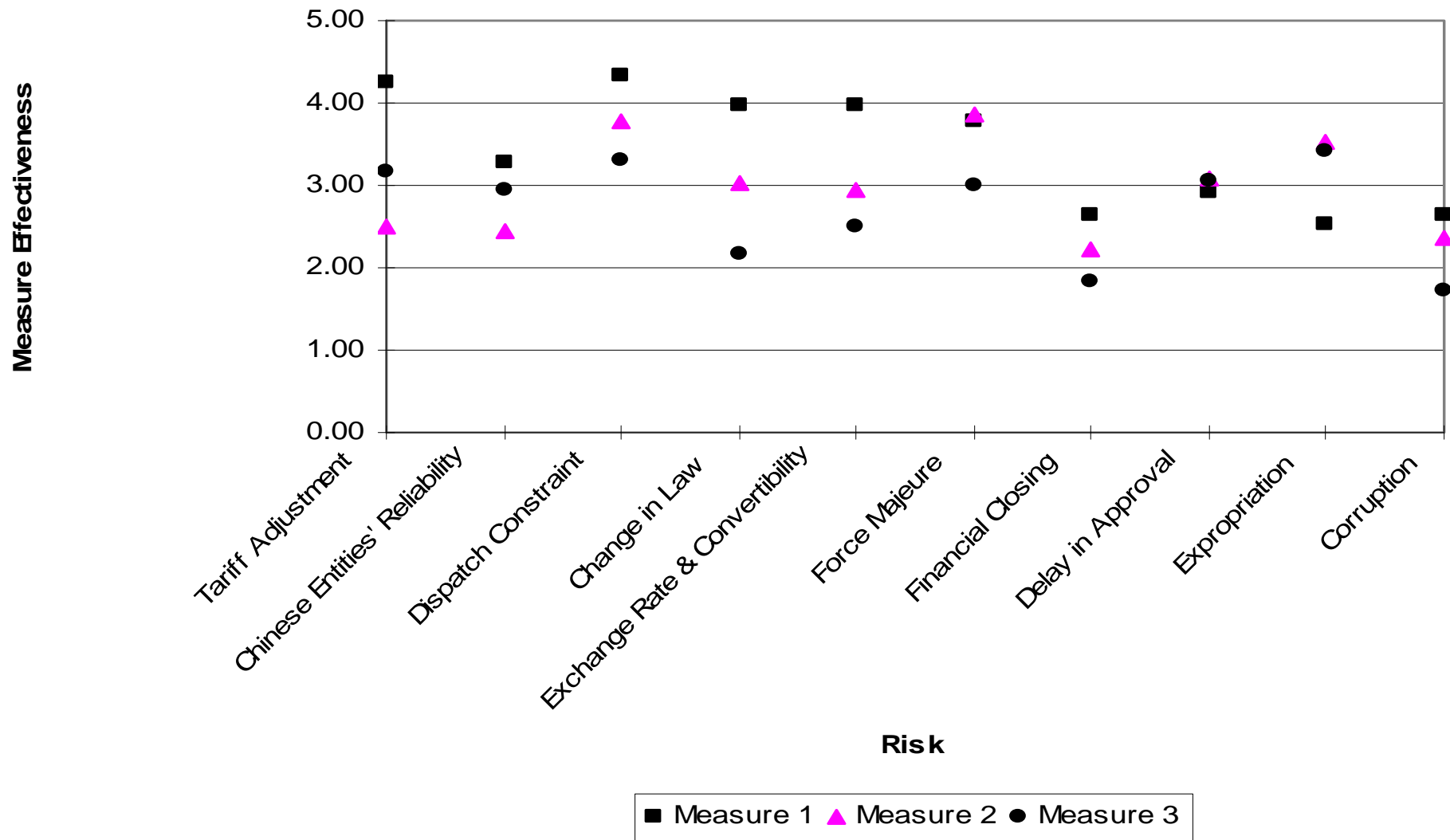
# Unique/Critical Risks in BOT Power Projects & Their Mitigating Measures

Risk	Measure 1	Measure 2	Measure 3
Change in Law	Obtain government's guarantees, e.g. adjust tariff or extend concession period.	Insurance for political risk.	Maintain good relationship with government authorities especially officers at state or provincial level.
Corruption	Maintain good relationship with government authorities especially officers at state or provincial level.	Establish JV with local partners especially the central government agency or state-owned enterprise.	Enter into contract to prevent corruption.
Delay in Approval	Establish JV with local partners especially the central government agencies or state-owned enterprises.	Obtain government's guarantees to adjust tariff or extend concession.	Maintain good relationship with governments.
Expropriation	Establish JV with local partners especially the central government agency or state-owned enterprise.	Rely on a combination of international consortium and insurance policies (political insurance).	Obtain support of sponsor's government, e.g. export credit.
Local Entities' Reliability	Gain accurate financial & other information about local entities and choose the most capable ones.	Maintain good relationship with government officers at state or provincial level.	Appoint independent accountant to audit the local entities.
Force Majeure	Obtain government's guarantees to adjust tariff or extend concession period.	Insure all insurable Force Majeure risks.	Obtain government's guarantee to provide finance help if needed.
Exchange Rate & Convertibility	Obtain government's guarantees of exchange rate & convertibility, e.g. fixed rate or to adjust tariff or extend concession to cover the cost.	Use dual-currency contracts, with certain portions to be paid in RMB and other transactions denominated in foreign currency.	Use hedging tools, e.g. forward, swap.
Financial Closing	Equity financing and cooperation with government partners.	Adopt alternatives to contract payment, e.g. land development rights.	Use Initial Public Offerings on stock to raise funds especially equity finance.
Dispatch, Transmission Constraint	Enter into take-or-pay power purchase arrangements with power purchaser (government).	Enter into dispatch contracts with government authorities to dispatch power plant at full capacity for a minimum number of hours each year.	Government to guarantee that transmission line will be ready for dispatch.
Tariff Adjustment	Have a formula for tariff adjustment that can enable objective calculation of tariffs each year.	Maintain good relations with government and a positive public image of the project.	Separate and re-define tariff, e.g. portions of tariff fixed while portions adjusted, or portions paid in foreign \$.

# Risk Criticality of BOT Project

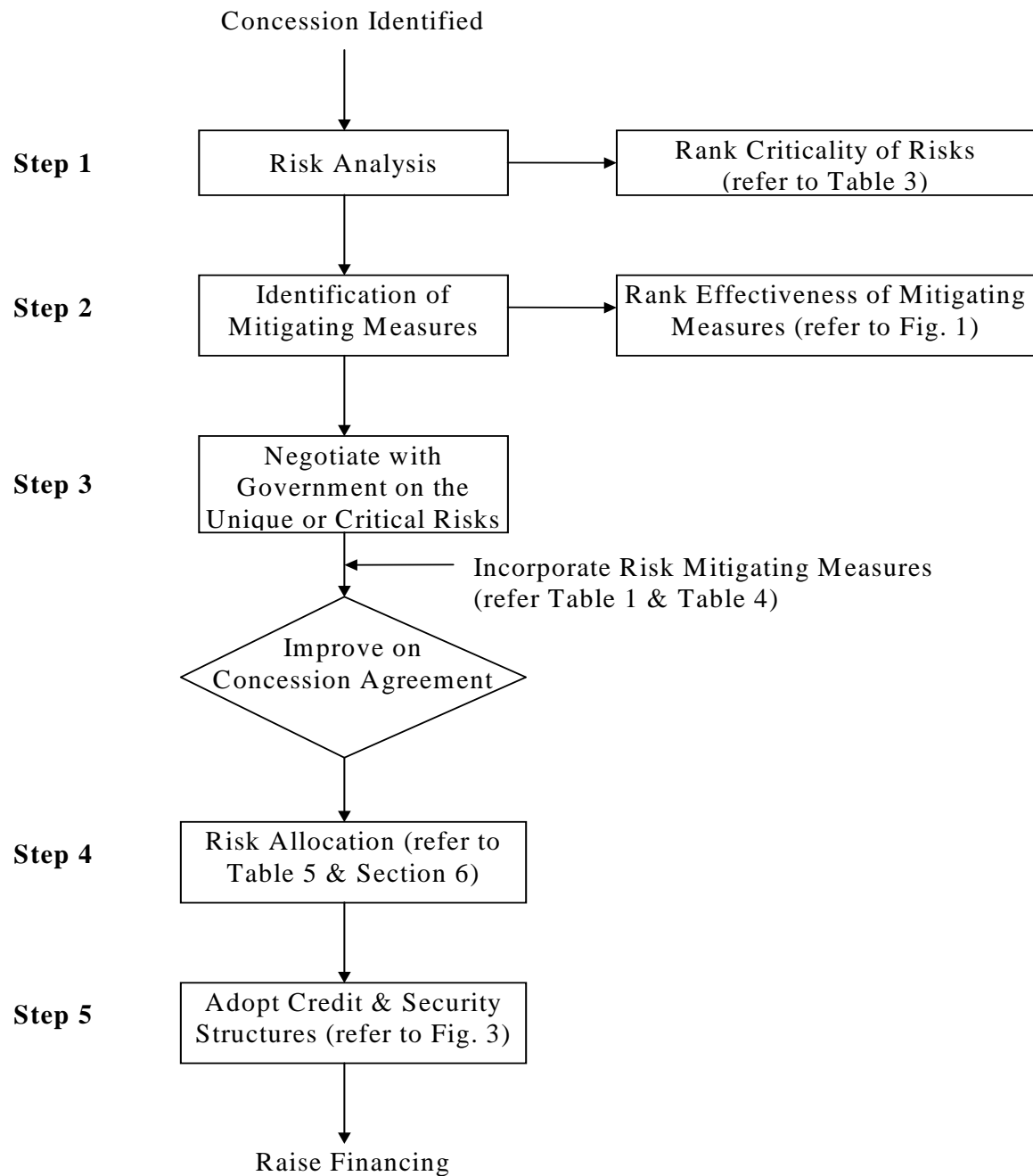


# Effectiveness of Risk Mitigating Measures



# BOT Risk Management Framework

([Full paper](#))



# Typical Risk Allocation

Risk	Provincial Government	The Consortium (sponsor/contractor/operator)	Lender	Insurer	Bond Bank/Insurer
Tariff Adjustment	X	X	X		
Local Reliability	X	X			
Dispatch Constraint	X				
Change in Law	X				
Exchange Rate	X (main)	X (partial)			
Force Majeure	X	X	X	X	
Financial Closing		X			
Delay in Approval	X (main)	X (partial)			
Expropriation	X			X	X
Corruption	X	X			

# BOT Critical Success Factors

**Critical Success Factors (CSFs) of BOT Projects (by Qiao L, Wang SQ, et al)**

Project Phase	Critical Success Factors	Foreign Investors			Local Officials			Significance
		Mean	SD	Rank	Mean	SD	Rank	
Preliminary qualification evaluation phase	Appropriate project identification	3.40	0.81	1	3.42	0.78	1	0.939
	Stable political and economic situation	3.27	0.87	2	3.25	0.85	2	0.944
	Favorable legislation regulations	3.17	0.79	3	3.05	0.72	5	0.574
	The capability of project promoter	3.14	0.66	4	3.13	0.85	3	0.820
	Experience with BOT project by promoter	3.10	1.05	5	2.92	0.83	6	0.482
	Lack of funds for infrastructure project	2.89	1.07	6	3.08	0.88	4	0.490
Tendering phase	Competitive tendering system	3.21	0.82	1	3.04	0.95	1	0.501
	Attractive financial package	3.00	0.85	2	2.96	0.71	2	0.121
	Acceptable toll/tariff levels	2.97	0.81	3	2.96	0.81	3	0.970
	Technical solution advance	2.93	1.03	4	2.65	1.00	4	0.923
	Selective suitable project agencies	2.83	0.87	5	2.46	0.78	5	0.106

## Critical Success Factors (CSFs) of BOT Projects (con't)

Project Phase	Critical Success Factors	Foreign Investors			Local Officials			Significance
		Mean	SD	Rank	Mean	SD	Rank	
Concession award phase	Concrete and precise concession agreement	3.20	0.92	1	2.96	0.86	3	0.329
	Reasonable risk allocation	3.17	0.79	2	3.13	0.80	1	0.849
	Special guarantees by the government	2.87	0.82	3	3.13	0.85	2	0.263
	Multilateral Investment Guarantee Agency	2.82	0.98	4	2.73	0.77	4	0.714
Construction phase	Quality control & supervision	3.59	0.57	1	3.21	0.72	1	0.038*
	Select suitable subcontractor	3.55	0.63	2	3.02	0.90	2	0.002*
	Standardization of engineering contract	3.20	0.92	3	2.96	0.86	3	0.329
	A multidisciplinary & multinational team	2.83	0.97	4	2.63	0.92	5	0.442
	Good relationship with government	2.66	1.04	5	2.79	0.93	4	0.621
Operation phase	Management control	3.41	0.73	1	3.33	0.82	1	0.707
	Training local staff	3.07	0.87	2	2.83	0.92	2	0.343
	Sound environmental impact	2.77	0.77	3	2.80	0.67	3	0.160
	Public safety	2.55	0.87	4	2.72	0.72	4	0.546
Transfer phase	Technology transfer	2.97	0.93	1	3.00	0.93	1	0.896
	Operation in good condition	2.87	0.86	2	2.92	0.78	2	0.825
	Overhauling guarantees	2.53	0.86	3	2.88	0.97	3	0.558

Note: SD = Standard Deviation; \* denotes significance at  $P < 0.05$ .

**Full Paper**

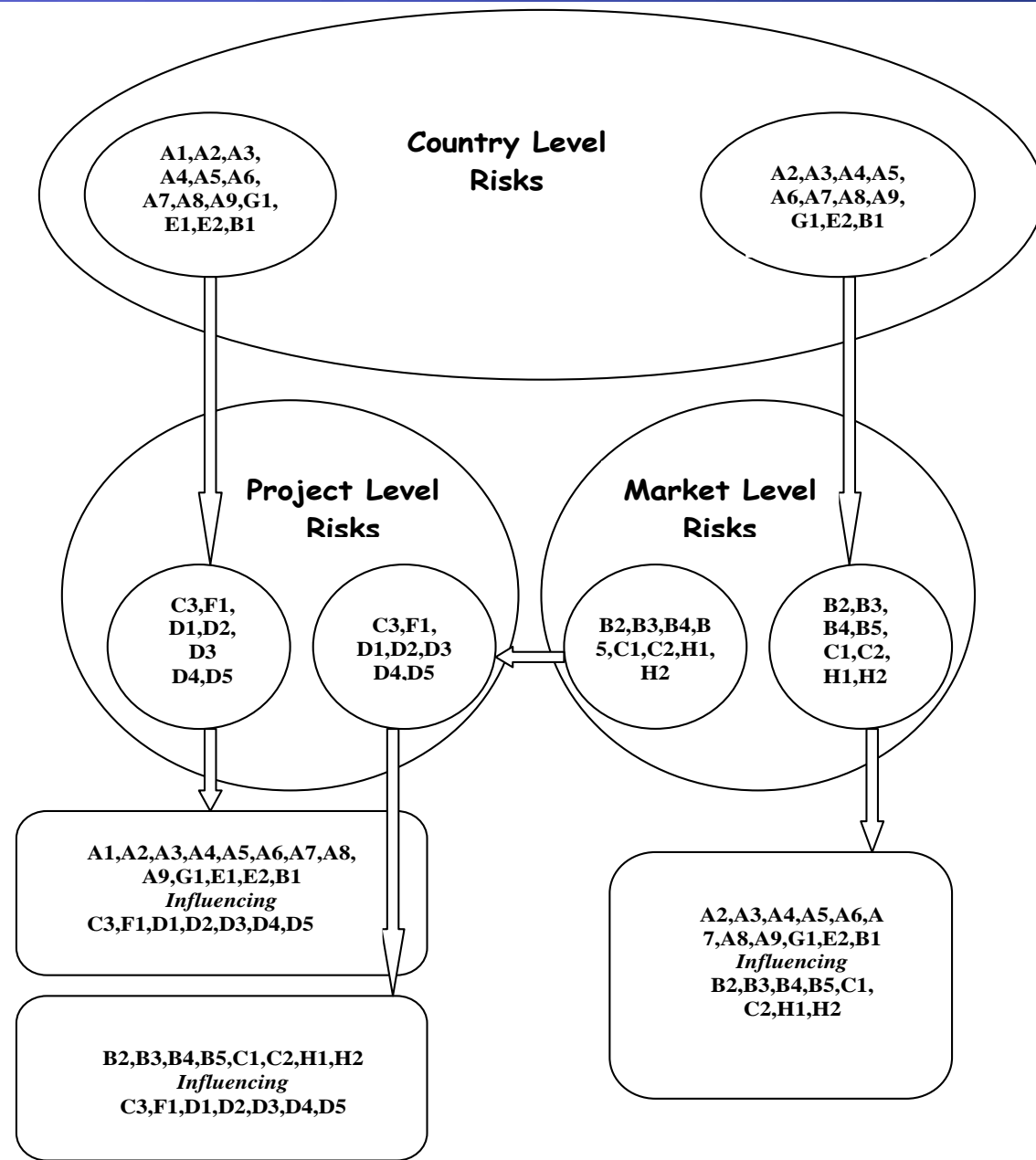
# Risk Management of International Construction Projects

- Risk's categories and definitions
  - Risk's mitigation measures
  - Risk's criticality
  - Risk's 3 hierarchy levels
  - Risk mitigation measures' effectiveness
  - Risk's influence among hierarchy levels
  - Risk influence matrix (relationship among risks)
  - Risk mitigation measures' prioritizing
  - **Risk Model – Alien's Eyes** (see next slide)
  - **Risk Management Framework** (see next slide)
- Usage: Applied to financial evaluation/negotiation/contract

# Proposed Risk Model: Alien's Eyes



Adopted by a PhD  
study in Griffith,  
Australia

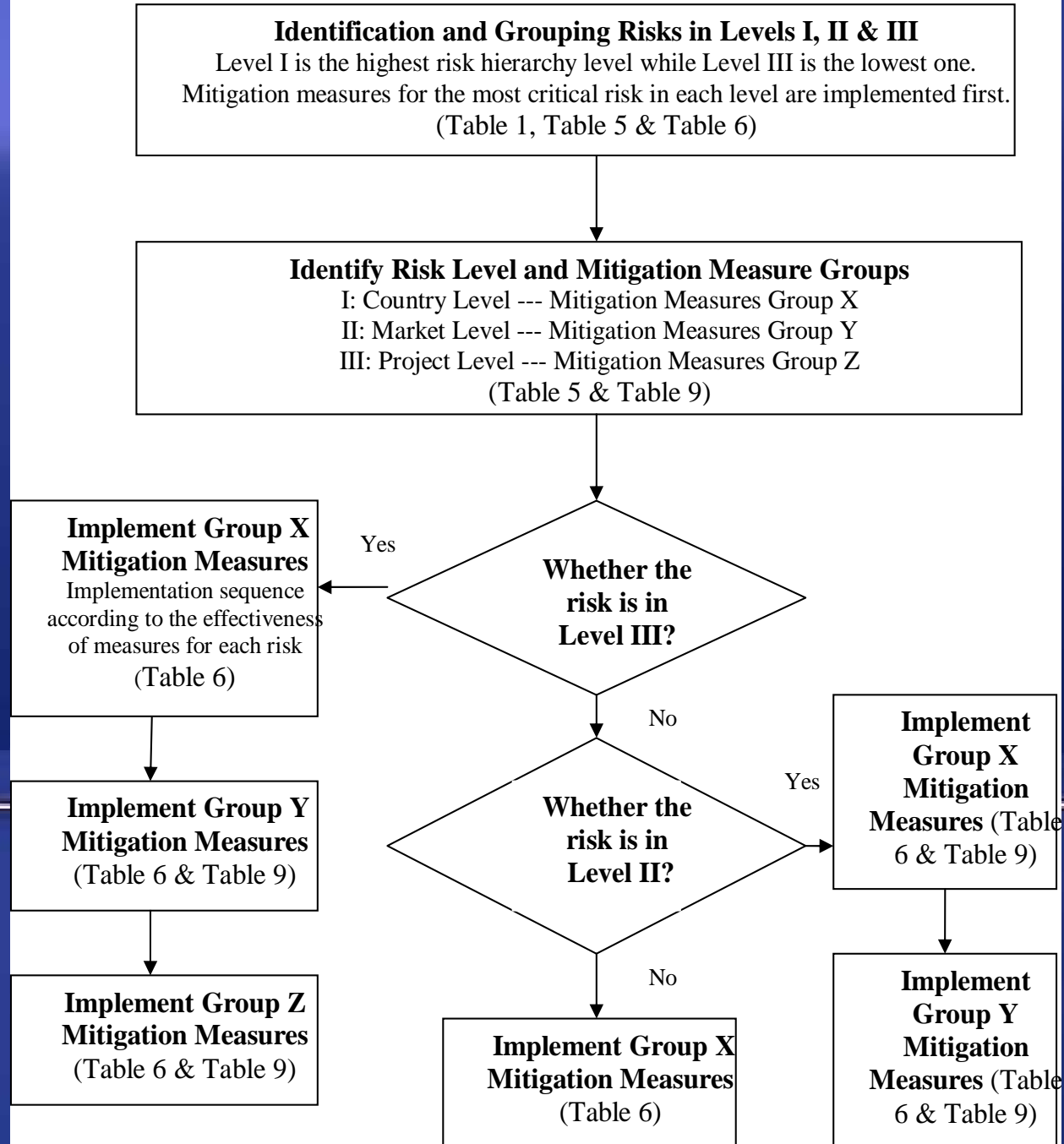


**Note:** Arrow represents the influence relationship  
Refer to Table 1 for risk IDs and definitions



# Risk Management Framework

([full paper](#))



# Laibin B's Major Characteristics

- First state-approved & open competitive tendered BOT project
- US\$650 million 2x350MW won by Electricite de France (60%) and GEC Alstom (40%) consortium on BOT basis in Nov 1996
- Debt/equity ratio is 3.4:1 with US\$502 million debt
- 18 year concession including 3 year construction
- First power project 100% owned by foreign investors
- No sovereign guarantee, but letter of support from central government agencies (SPC, SAFEC; MOP)
- Foreign exchange guarantee & off-take & fuel supply supports
- Tariffs pegged to the market price
- Model for future BOT projects in PRC

# Laibin B's Development Process

- Initial Planning

- Feb 1995: Guangxi entrusted Bridge of Trust
- Mar 1995: Bridge of Trust submitted proposal & feasibility study report to SPC for approval of adopting BOT scheme to develop Laibin B
- May 10, 1995: SPC approved the proposal & Laibin B become the first state-approved BOT project in PRC

# Laibin B's Development Process (con't)

- Pre-Qualification
  - Aug 1995: Bridge of Trust issued Invitation for Pre-qualification to foreign developers
  - Sep 1995: **31** foreign developers submitted applications for pre-qualification
  - Oct 1995: **12** qualified to tender individually (Group A); **19** qualified to tender jointly only with company/companies in Group A

# Laibin B's Development Process (con't)

- Tendering
  - Dec 8, 1995: Bridge of Trust released Invitation to Bid & Tender Documents to pre-qualified foreign developers
  - Dec 1995 - Jan 1996: Bridge of Trust organized on-site inspections for potential tenderers
  - Jan 28, 1996: Bridge of Trust conducted pre-tender meeting to clarify foreigners' concerns
  - **6** tenderers submitted bids by deadline
  - May 8, 1996: tender opening for Laibin B

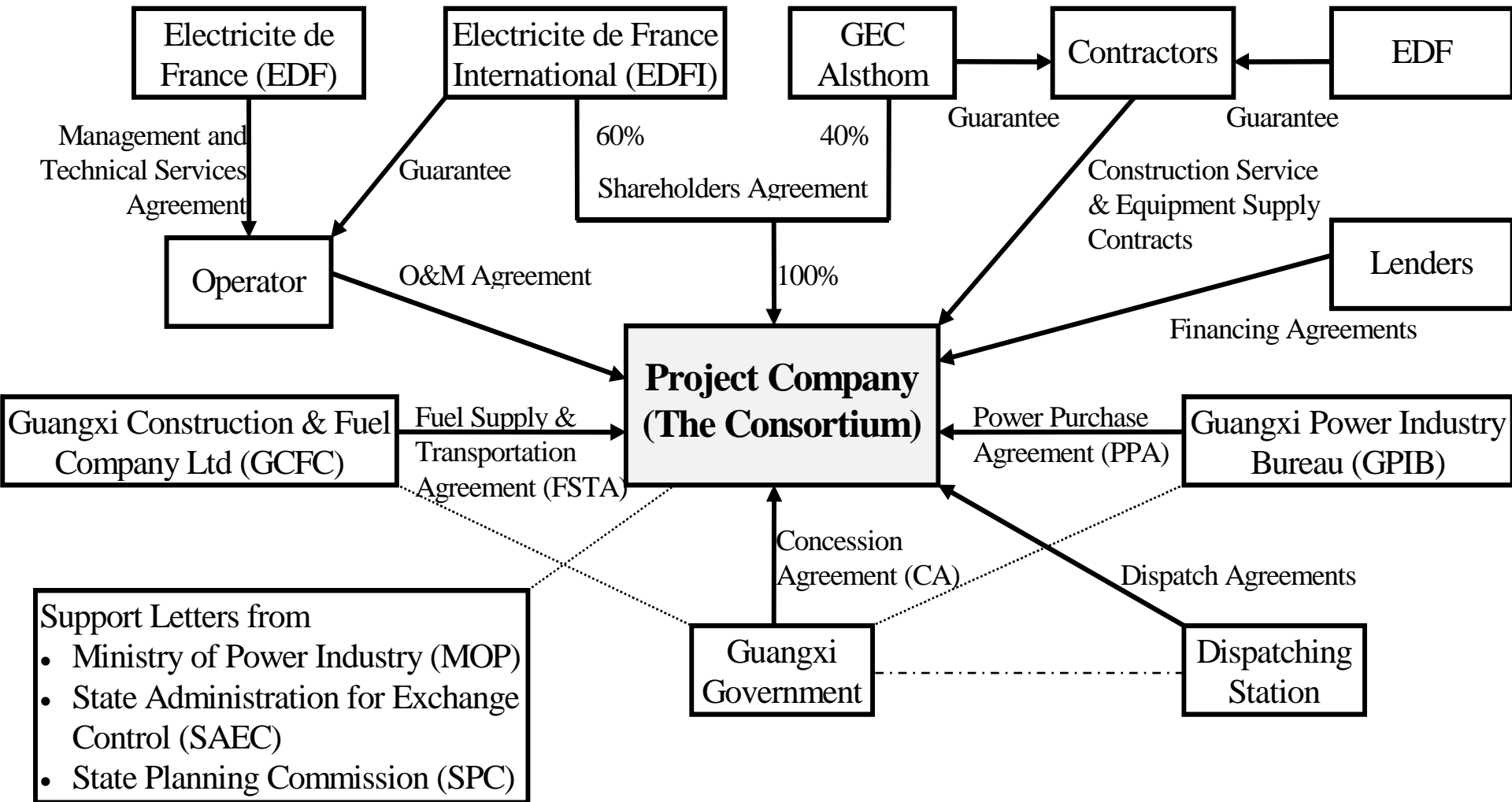
# Laibin B's Development Process (con't)

- Tender Evaluation & Awarding
  - Jun 18, 1996: **3** tenderers were short-listed by the Evaluation Committee: (1) EdF & GEC Alsthom Consortium, (2) NWI+AEP+ABB Consortium, (3) InterGen(HK)
  - Jul - Nov 1996: Bridge of Trust negotiated with the 1st short-listed tenderer (EdE & GEC)
  - Nov 11, 1996: Initialing Project Documents (CA, PPA, FSTA etc) and Bid Award
  - Sep 3, 1997: Signing of Project Documents and Financial Close

# Evaluation Criteria for Laibin B Tender

- Electricity Tariff (60% weight in evaluation)
  - levelized tariff, proportion of foreign exchange
  - EdF&GEC: **lowest tariff** (US\$0.05/kWh, before tax) & reasonable ROI (17.5%)
- Financing, Technical & OMT Proposals (40%)
  - ~~financing schedule, cost, ability to finance & equity~~ (60% weight)
  - reliability & quality of technology (20%)
  - feasibility & viability of OMT, training (20%)

# Laibin B's Contractual Structure



# Laibin B's Risk Allocation

Risk	Guangxi Government	The Consortium (as Sponsor, Contractor and O&M Contractor)	Lender	Insurer	Bond Bank or Insurer
<b>1. Political Risks</b>					
• revoke, expropriation, sequestration	X				
• exclusivity, i.e. not second facility		X			
• changes in law	X				
• development approvals	X	X			
• adverse Government action or inaction	X	X			
• provision of utilities	X	X			
• increase in taxes	X	X			
• political force majeure events	X				
• termination of concession by Government	X				
• payment failure by Government	X	X			
<b>2. Construction Completion Risks</b>					
• land acquisition and compensation	X				
• restriction on import equipment/materials	X				
• cost overruns		X	X		X
• increases in financing costs		X	X		
• time and quality risk		X			X
• Contractor default		X			X
• default by Concession Company	X	X			X
• time, cost and scope of identified but related work and variations					
• environmental damage - subsisting	X			X	
• environmental damage - ongoing		X			
• protection of geological & historical object	X				
• force majeure	X	X		X	X
<b>3. Operating Risks</b>					
• Government Department default	X				
• Concession Company default		X			
• Operator inability		X			
• termination of concession by the Company	X	X	X		X
• environmental damage - ongoing		X			
• force majeure event	X	X		X	
• labor risk	X	X			
• technology risk		X			
• prolonged downtime during operation		X		X	
• condition of facility (maintenance)		X		X	

# Laibin B's Risk Allocation (con't)

Risk	Guangxi Government	The Consortium (as Sponsor, Contractor and O&M Contractor)	Lender	Insurer	Bond Bank or Insurer
<b>4. Market and Revenue Risks</b>					
• insufficient fare income	X	X			
• fluctuating demand of power generated	X				
• transmission failure	X				
• problem in bill collection	X				
• insufficient other income		X	X		
• power theft	X				
• fluctuate of cost & availability of fuel/coal	X	X			
• Government restriction on profit & tariff	X	X	X		
<b>5. Finance Risks</b>					
• inflation risk	X	X	X		
• interest rate		X	X		
• foreign currency exchange rate	X	X			
• foreign currency convertibility	X				
<b>6. Legal Risks</b>					
• title/lease property	X	X			
• ownership assets		X			
• security structure			X		
• insolvency of Concession Company		X	X		
• breach of financing documents		X	X		
• enforceability of security			X		
• documentation/contractual risk (conflict & arbitration, applied laws)	X	X	X		
<b>7. Competition risk (before bid award)</b>		X			

# Lessons Learnt: EdF's CSFs in Winning Laibin B

- **Low tariff/price** (reasonable ROI, 17.5% vs. 18%)
- Good reputation, experience & technology
- Less guarantees from Chinese government
- Support from foreigner's home government, e.g. credit-export COFACE (France)
- Strong local partners
- Familiar with Chinese investment environment, regulations & tendering system etc.
- Identify, mitigate & manage well associated risks
- Good relationship w. Chinese authorities/partners

# Lessons Learnt:

## Laibin B (Official BOT) with WFOE

- Open, international, rule-based competition focusing on consumer **price** levels ensure strong incentives and encourage operational efficiency.
- **Pros:** cheap, quality product & service; bank governance & transparent, price competition efficient, active management
- **Cons:** approvals; local resistance



## Laibin B is a Model

- Laibin B has become a good **model** for foreign invested BOT projects in PRC.
- Similar **contractual structure/terms** used in the 1st state-approved BOT water plant in Chengdu,

• • • •

For more details, see my relevant **Papers** at

<http://166.111.44.134/Paper/Paper.htm> or

<http://learn.tsinghua.edu.cn:8080/2002990155/Paper/Paper.htm>

# Lessons Learnt in PRC

- **Important to follow international custom/ practices**
  - Fair risk allocation, standardized documentation, appropriate and transparent tendering process, etc
- **Important for government to have BOT knowledge & reasonable expectation & to share risks**
  - Obtaining professional advisory services (Agent) is necessary
- **Economic environment** ultimately defines supply and drives demand, with realized and expected **economic growth** underlying the **attraction/success** of projects.
- **Legal environment** defines country's economy boundaries and constrains investors' alternatives.
  - In developing countries, **enforcement of laws** is important

# Lessons Learnt (con't)

- Proper **risk management** is critical, especially
  - For government, sharing some risks is important and more cost efficient – don't sign un-fair contracts;
  - For investors, a careful & active approach to clearly **align their interests with the government & society** is critical to avoid conflicts and reduce risks;
  - Clear/strong **contractual** arrangements and **enforcement**
- The public-private interface is throughout the period of **long term CA**. It is importance to maintain a **good relationship** with partners
  - Sometimes **re-negotiation** with partners is more efficient than mediation/arbitration/lawsuit when there is **dispute**

# Lessons Learnt (con't)

- Government's **supports and commitment** (& **efficient assistant & friendly attitudes**) are important, e.g.
  - Direct investment, Supportive loan, Foreign exchange guarantee, Tax holiday, Subsidy, Free/low cost of land use, Policy support, Off-take agreement, Supply agreement, Necessary Infrastructure
- But Government's **over direct involvement** would reduce efficiency
  - Government better to **oversight only** the Scope & requirements, Price & fees, Quality & adequacy of service
- All parties to have **project life cycle** objectives
- **Baring higher/lower rates of return** is a good practice

# Concluding Remarks

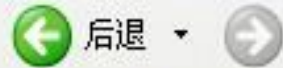
- BOT/PPP is an **effective way** for developing infrastructure especially in developing countries
- All parties to have **common & long term** objectives (VFM)
- **Reasonable risk allocation** is important, usually
  - The Private takes financing, design, construction, procurement, operation and maintenance risks;
  - The Public takes political, change in law, foreign exchange risks;
  - Both share Force Majeure risks.
- Government's **supports & commitments** are important but over direct involvement would reduce **efficiency**
- The **structuring and contracts** should take into account the country & project's **characteristics**

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I am an academic staff with multidisciplinary backgrounds (B.Sc. in *Structural Engineering*, M.Sc. in *Construction Management & Economics*, Ph.D. in *Construction Productivity*, Post-Doctor in *Project Financing*, and amateur in *IT Application*) in the Institute for International Engineering Project Management and Department of Construction Management, [Tsinghua University](#), Beijing, PRC.

In my homepage, you will find plenty of information about myself ([Brief Biography](#), [Full Resume](#) and [Album](#)), the [Researches](#) I involved in ([Risk Management of Build-Operate-Transfer and Public-Private Partnership Projects](#), [Performance of Ready Mixed Concrete Industry](#) and [IT Application in Construction Engineering & Management](#)), [a dozen of books](#), [three videos](#) and more than [200 papers](#) I published. There are also [Course Materials](#) and [Timetable](#) for the modules I am teaching at Tsinghua University (the [top one university in PRC](#)), [Useful Links](#) for building, construction and real estate, etc.

**Thank You !**