

RISK VARIATION ASSESSMENT OF INDIAN ROAD PPP PROJECTS

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Abstract: Private sector participation and private investment has become the mainstay of the Government of India's policy toward infrastructural development. The success of the ongoing twelfth five-year plan critically depends on the success of Public Private Partnerships (PPPs) in infrastructure. In this Paper major risk factors of ongoing PPP highway projects (under NHA and MPRDC) have been identified. Cumulative impact of risks and its fluctuation over various phases of BOT project life have been analysed. In view of the findings it is suggested to set up Regulator to the PPP Road projects which could oversee the fast changing overall socio economic environment and suggest measures to lessen risk and create win-win situation to all stakeholders.

Keywords: Risk, PPP, AHP, BOT.

1. Introduction

Economic growth and infrastructure: Our vision of India is of a nation bustling with energy, entrepreneurship and innovation. The country's people will be better fed, dressed and housed, taller and healthier, more educated and longer living than any generation in the country's long history. India, along with independence inherited famine and poverty from its colonial rulers. Main reason for poor economic growth was absence of good physical infrastructure. During initial period of independence spending on infrastructure had been at abysmally low rate of 5% of GDP, it prevented India from sustained economic growth and gross domestic product (GDP) growth. The economic advancement of a nation critically hinges on the adequacy of infrastructure availability.

The miraculous transformation of the economies of the South-East Asian nations such as Japan, Hong Kong, the Republic of Korea, Singapore, Thailand, Malaysia, and the People's Republic of China and Taipei were preceded and reinforced by quantum investments in physical and social infrastructure. Recently for the last 5-10 years India's spending on infrastructure has been around 8 % of GDP. In 11th plan spending on infrastructure has been around 8.2% of GDP and therefore the GDP growth rate has been hovering around 8-9%. Growth signs are visible all over the country. And in the 12th plan

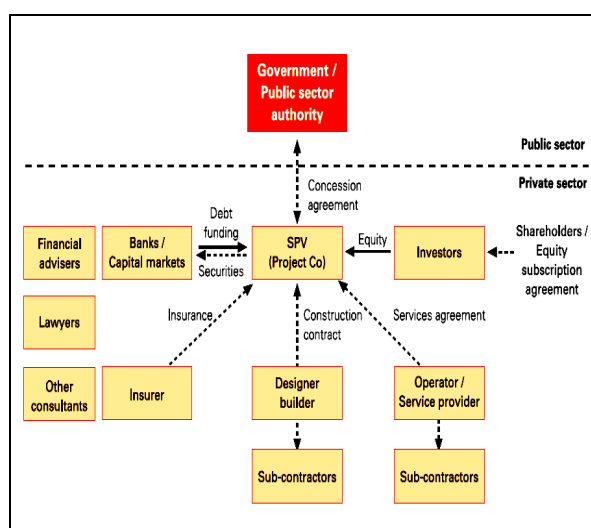
spending on infrastructure (Around Rs.45 lakh crore) would be around 10% of GDP and the projected GDP growth rate shall be around 9 to 9.5%. The total investment in civil infrastructure would have to be over \$ 1 trillion during the 12th Plan period.

Infrastructure financing through PPP: Financing this level of investment will require larger outlays from the public sector, but this has to be coupled with a more than proportional rise in private investment. Private and PPP investments share shall have to be around 50 per cent in this Plan. Clearly, for want of resources, a lot of this infrastructure has to be built through private-public participation, like BOT projects.

Public Private Partnership

Public Private Partnership (PPP) bring private and public sectors together in long-term contracts to produce a required infrastructure like roads, airports, water systems, hospitals etc. In PPP a private entity, usually a consortium responsible for financing, design, construction, operation and maintenance of the facility for agreed duration known as concession period and at the end of the period transfers the ownership of the operational facility to the government at no cost. In return, the private entity generates revenue either from the levying of tariffs on users or the receipt of periodic service payments from the government over the life of the BOT agreement

Figure-1. Agreements between PPP Participants



Significance of the Study

The success of the ongoing twelfth five-year plan critically depends on the success of PPPs in infrastructure. Government authorities are calling bids to cover the mammoth targets of Road building, private sector is hurriedly bidding for the projects at low price, and the issues of project structuring to reduce overall risk is still not being looked into. Lenders are overcautious over PPP project financing; projects are being withdrawn prematurely due to land acquisition and Environmental clearance issues and General public is suffering due to poor performance of ongoing PPP projects. In fast changing social, economical, political and legal environment, BOT projects are moving towards uncertain future. To address these issues Need of the hour is to call all stakeholders of the BOT projects and identify the risks, allocate them to the capable partner and structure the agreement to reduce overall risks and create win-win situation to all stakeholders

2. Objective

Objective The PPP involves large number of parties, the Parties bear different risks over various phases of life. The BOT Road project life is quite long in which things may go in undesired way and may impair the successful delivery of the PPP Project. This study is therefore an attempt to assess impact of risk over project life with a focus on threats, towards a strategic management of uncertainty, creating win-win situations to stakeholders of the PPP project.

The specific sequence to achieve these objectives:

1. Identification of risk factors and risk categorisation by literature review and expert interviews.
2. Risk evaluation by conducting field surveys by sending postal questionnaire and interviews of the experts.
3. Preparation and analysis of General questionnaire for assessing impact of various risks over various phases of BOT road project life.
4. Plotting graph showing movement of risk over different phases of project life.

3. Risk Identification

The PPP projects present a different risk profile than conventional projects. Many of the risks in a PPP project come from the complexity of the arrangement itself in terms of documentation, financing, taxation, technical details, sub agreements, and market conditions.. Some of the **major Risks** are as following:

Regulatory Risk Crop up due to lax regulatory framework fixing of tariff and charges, dispute resolution, lack of independence of regulator comes under this risk.

Legal Risk comes with lack of a standard model for PPP agreements that leaves general and special contract conditions vulnerable to challenge and poor execution management. **Force Majeure risk** is the risk which is beyond the control of the project developer (floods, earthquake, war etc.)

Political Risk: The project may be subjected to unwarranted government intervention. For instance, the government may unilaterally decide to nationalize or expropriate some or all part of the project. The extent of political risk and governmental interference is influenced by the prevailing political regimes and the economic importance of the project to the local economy..

Land Acquisition: The primary reason for certain segments of the GQ phase of the NHDP exceeding the project completion deadline had been due to problems in land acquisition. The effects of this can be mitigated with the project starting only after all the required land is procured and handed over by the government.

Environmental risk & Social risk: delay in getting environmental clearance and pollution issues may impact performance of the project. There should be an effective R&R policy for social and environmental impact assessment and findings of such assessments should be discussed in public with affected stakeholders **Financial Risks:** Financial risk is the risk of debt service and failure to pay adequate returns. **Funding Risks-** Failure to reach financial close, this is largely carried by the Promoter. **Interest rate risk** arises due to changes in interest. Interest-rate movements between the submission of bids and financial close. **Debt servicing risk** is the next in criticality. Appropriate debt–equity mix and proactive managerial strategies in financial restructuring would be the risk mitigates.

Construction Risks involve project delays, time and cost overruns, flaws in design, changes in design and engineering, and commencement of cash flows. Delays in project completion can add to cost escalation are vital. Public-sector procurement has a history of large capital-cost overruns. Tough pre-qualification of bidders, close oversight over contractors can act as mitigate.

Termination Risk is the risk that the PPP arrangement will be terminated early, either through the Provider failing financially or failing to perform technically, e.g. by not providing the contracted service adequately. This is a risk for the Provider as it will almost certainly

suffer a material financial loss on termination. The risk can be partially mitigated by selecting suitable bidders.

O&M Risks: There are two key elements. Firstly, that the asset's maintenance requirements will be different to those predicted and secondly that there will be a difference in unit cost of maintenance. The Provider should therefore have an incentive to produce an asset with the lowest whole-life cost.

Revenue Risk: The Coimbatore Bypass project experience, where enforcement of toll collection has been the problem, is illustrative of the toll collection risk. The Provider can be remunerated either by toll collection or by shadow tolling.

Demand/market risk:. This risk comes due to over-estimation by stakeholders, more as a result of 'feel good' about the project rather than a 'hard-nosed' look at the traffic and its drivers. Demand risk may be a direct consequence of government policy

4. Impact and Movement of Risk over Project Life

Preparation of Questionnaire: The study includes review of a wide range of survey of published literature in diverse areas of Construction management, PPP concession agreements, model concession agreement, risk management and risk associated with BOT highway projects. After literature review and further discussion with experts a comprehensive checklist of 10 risk categories and 41 risk factors were selected. This checklist became a basis for interviews with more experts. Based upon this checklist questionnaire was prepared. After performing this part, three BOT road projects were selected as a case study (i) Gwalior –Bhind- MP/UP border (NH- 92) Project (MPRDC) (ii) Gwalior- Jhansi (NH-75) Road (NHAI) and (iii) Gwalior- Shivpuri (NH-3) road (NHAI).

Survey Participants: The interview and survey was conducted among experts with various parties of PPP projects and researchers who have conducted research on PPP model of infrastructure procurement. The participant includes the project managers from concessionaire, MPRDC, NHAI, Independent Engineers, working mainly in the Northern and Central India specially MP. The questionnaires were sent to the participants by post, e-mail etc. Out of 30, many responded but only 8 have been considered fit for AHP analysis, other rejected due to inconsistent responses.

Compilation of Questionnaire response:.The response of experts over the questionnaire is compiled as following:

- a) In Questionnaire the experts have been asked to comment on the impact of Risk i.e. severe (S), High (H), Medium (M), Low (L), Very Low(VL) over the various phases of Project life i.e. Initiation phase (1), Tendering phase (2), Financing phase (3), Construction phase (4) O&M phase (5) and Transfer phase (6).
- b) Final marking based upon the responses is shown in Table 2.
- c) Weight age of the impact considered for study for severe impact (S=10), High impact (H=8), Medium impact (M=6), Low impact (L=4), Very Low impact (VL=2).

Table- 1: Questionnaire and Result compilation

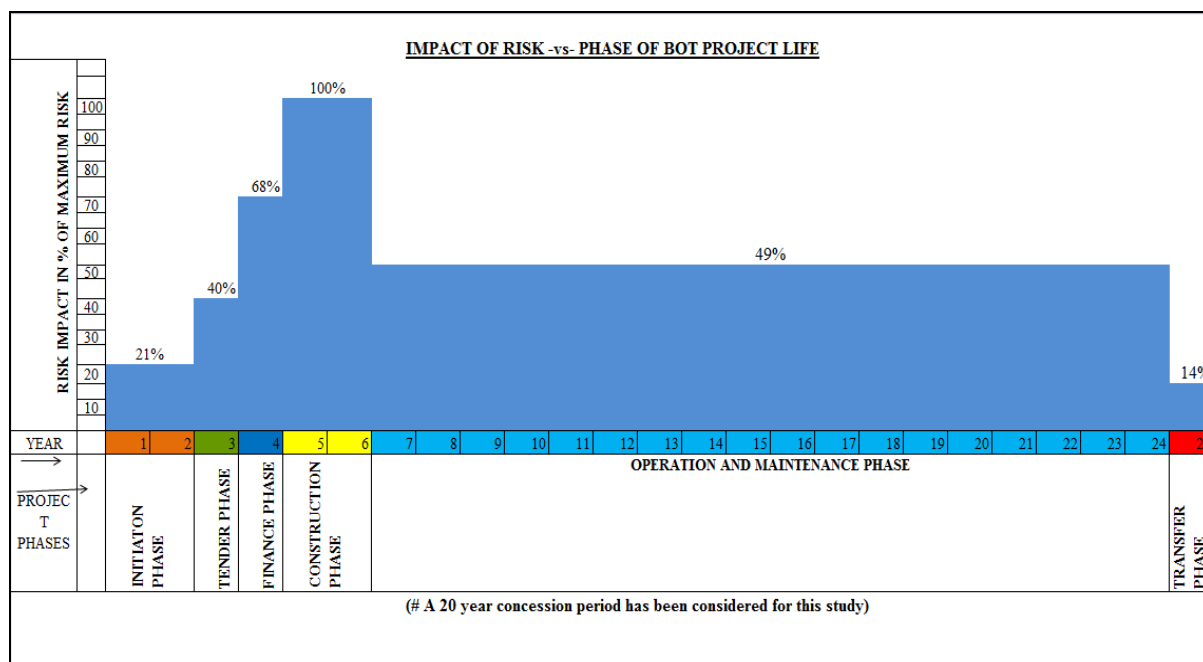
Risk presence and its weightage during various phases of the project life:-

Risk No.	Risk category	Risk Factors	Phase of project life	Final Mar king	Phase of project life					
					1	2	3	4	5	6
R-1	Political Risk	1. Change in legislation /policy	1,2,3,4,5,6	L	4	4	4	4	4	4
		2. Termination of agreement by govt.	3,4,5,6	L			4	4	4	
		3. Attitude of govt. toward foreign investor/ investor	2,3,4	L		4	4	4		
		4. Imposition of new taxes/ increase in taxes	3,4,5,6	L			4	4	4	4
R-2	Regulation Social & Legal risk	1. Change in Law	3,4,5,6	VL			2	2	2	2
		2. Change in regulation	3,4,5,6	VL			2	2	2	2
		3. Environmental. Clearance/ Pollution	1,2,3,4	S	1 0	1 0	1 0	1 0		
		4. Land acquisition/ compensation/ Social impact assessment	1,2,3,4	H	8	8	8	8		
R-3	Support from Local govt. risk	1. Support from local/ state govt.	4,5	M			6	6		
		2. Political opposition	1,2,3,4,5	M	6	6	6	6	6	
		3. Support from local Public	3,4,5,6	L			4	4	4	
R-4	Force Majeure	1. Social unrest problem	1,2,3,4,5	VL	2	2	2	2	2	
		2. Natural calamity	3,4,5,6	L			4	4	4	4

		3. Historical findings	2,3,4	VL		2	2	2			
		4. Rebellion/ Terrorism	3,4,5	VL			2	2	2		
R-5	Constru ction Risk	1. Change in the scope of work	4	M				6			
		2. Poor geotechnical condition	4	L				4			
		3. Poor contract management/ non performance of vendors/ subcontractors	4	M					6		
		4. Availability of Labour/ Material	4	M					6		
		5. Bad weather	4	L					4		
		6. Cost overrun	4	M					6		
		7. Time overrun	4	L					4		
		8. Technology Risk (Unproven tech./ design deficiency)	4	VL					2		
R-6	Operation & Mainten ance Risk	1. Unexpected/ Unforeseen deterioration	5	L						4	
		2. Design deficiency/ bad workmanship /low quality during construction.	5	L							4
		3. Tolling technology	5	VL							2
		4. Overloading control	5	VL							2
		5. Traffic/Incident management	5	VL							2
		6. Cost overrun Risk	5	L							4
No.	Risk category	Risk types/ factors	Phase of project life	Final Mar king	Phase of project life						
R-7	Transfer risk	1. No residual value	6	VL							2
		2. Transmission failure	6	VL							2
R-8	Financial risk	1. Inflation rate volatility	2,3,4	M		6	6	6			
		2. Interest rate volatility	2,3,4,5	L		4	4	4	4		
		3. Financial closure risk	3	H				8			
		5. Poor financial market	2,3	M		6	6				
		6. High cost of financing Risk	2,3,4	M		6	6	6			
					1	2	3	4	5	6	
R-9	Commer	1. Traffic/ level of demand risk	4,5	H				8	8		

	cial Risk	2. Non competing facility	3,4,5	M			6	6	6			
		3. Lack of demand/ slow economic development of the country	4,5	L				4	4			
		4. Delay by govt. notification of toll collection.	4	VL				2				
R-10	Lender's Risk	1. Default of the concessionaire	4	H				8				
TOTAL RISK WEIGHTAGE							30	58	100	146	74	20
							21%	40%	68%	100%	49%	14%

Figure-2: Graph showing Movement of Risk



6. Result and Analysis of Findings

Questionnaire survey among experts resulted 10 risk categories and 41 risk factors. These risks have been considered for risk assessment (see Table-1). Impact of these risks over project life is illustrated in the Figure-2.

The study illustrates the PPP project carries higher risk throughout the project life. One of the main reasons of high risk is long project duration. Risk in BOT Project rise up as project progresses and the project faces highest risk during its construction phase. The risk quotient drops to less than half as soon as the construction of the project is over. The PPP mode bears heavy risk during entire life span except initiation and transfer phase. The volatile social, economical and legal environment creates major risk upheavals during the PPP project life.

Considering long concession period and fluctuating risk profile of PPP road projects it is suggested to setup a Regulator to the PPP road projects which could oversee the fast changing overall socio economic environment and suggest measures to lessen risks in the upcoming projects; could intervene when the issues could not be addressed within the agreement. He can be empowered to renegotiate during the ailing phase of the project, thereby ensure successful implementation of PPP projects and create win-win situation to all stakeholders.

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