Pacific Business Review International
Volume 8, Issue 2, August. 2015

Framework of Risk factors and Financing Implications for Road Projects in India: Study of Selected Cases

Sankersan Sarkar
Associate Professor (Finance)
Management Area, NIIT University
Neemrana, Alwar

Raj K Kovid
Associate Professor (Strategic Management)
Management Area, NIIT University
Neemrana, Alwar

Abstract

Several road projects get stalled during their execution phase – either not completed in time or continue charging toll without completing the project on pretext of certain risk factors. The existing frameworks for mapping risk factors for road projects are unable to capture certain risk factors that are not associated with the stage of the project and hence such projects face problems in financing. Based on three cases of road projects in India, this paper attempts to improve upon the existing frameworks by identifying such risk factors, their consequences and implications for financing. It is concluded that the practice of allocation of risks to various parties is in itself not sufficient for the successful execution of the project. Thus, the study recommends that beyond the allocation of risks there should be a contingency financing mechanism for the completion of the road projects when they are seriously affected by the risk factors.

Keywords:

Road Projects, Financing Mechanism, Allocation of Risk

Introduction

Being a major constituent of infrastructure of an economy, road projects' successful and in-time completion set the stage for fast development of a nation. Being an emerging economy, India needs to develop road infrastructure relatively faster so as to catch up with developed and neighbor economies. However, road infrastructure development has its own challenges in terms of garnering resources, particularly, financial resources. Moreover, infrastructure investments have some common characteristics which distinguish them from other types of investments. Infrastructure projects tend to involve very large amounts of capital, require financing for longer maturities, have higher risk and generate lower returns (Mor and Sehrawat, 2006). These characteristics differentiate the financing requirements of infrastructure investments from those of others types of investments. Within infrastructure investments, projects for roads and highways deserve a special attention because the investment needs for creation of new roads and highways, and repairs and maintenance of the existing ones, is growing rapidly in order to support the economic growth.

From a financing perspective the successful implementation of a road project critically depends on the availability of (a) the required amount of financing, (b) the financing at the appropriate time and (c) the financing at a feasible cost. All these three issues critically depend on the risk factors involved in the project which tend to emerge with the progress of the project. Thus it is imperative to identify and assess the potential risks and their financial implications, at the time of conceiving a project. In view of budget constraints with Government agencies, the road projects, of late, are increasingly being implemented through Public Private Partnership (PPP) mode. Under PPP, the issues of adequacy, timeliness and cost of financing are especially important because the willingness of the private sponsors and their ability to arrange financing would depend on how the risk factors are addressed while structuring such road projects.

In this paper, an attempt has been made to identify the risk factors the road projects in India are generally exposed to, and their implications for financing. The remainder of the paper is organized as follows. Next section provides for review of the literature about the risk factors in road projects followed by the research methodology. The following section reports about three cases on road projects in India. This is followed by a discussion based on cases of road

projects. Next section deals with the consequences of risk factors followed by the implications for financing of road projects. The last section describes the conclusions.

Literature Review

In general road projects undergo various stages or phases during their lifetimes and are exposed to different risk factors during such phases. Yukia, Keiichi and Kazuaki (2005) have empirically studied the risks of road projects in Japan. They have classified the lifetimes of road projects into five stages viz. (i) Surveying and Designing, (ii) Design Consultation, (iii) Land Purchase, (iv) Construction Work and (v) Post-Opening. They identify six categories of factors in each of these five phases, which act as sources of risk and lead to various events that affect the road projects. These six categories of factors are: (a) Social, (b) Economic, (c) Administrative, (d) Natural, (e) Technological and (f) Formulation of a consensus.

Yukia et al (2005) find that at the surveying and designing stage the risk factors generally lead to two major events: (a) repeated work due to change of route and (b) repeated work due to change of structure. The natural consequence of both these major events is cost overrun as well as time overrun. Moreover the time overrun may lead to delay in the overall schedule of the project. At the design consultation stage the major events arising out of the risk factors are: (a) Consultation on environmental issues, (b) Consultation with local communities on the route/structure and (c) Coordination with the organisations concerned. Consequently these events lead to delays in project implementation and increased costs.

Further, the risk factors at the land purchase stage mainly lead to the event of difficulty in land purchase negotiation. The authors have provided evidences of other events as well; however this event is most significant. These risk factors result in delay in completion of the project. The most significant event at the construction work stage arise out of the problems in the surrounding area; however many of the problems can be avoided by proper management of the project from the beginning. The major events arising out of the risk factors in the post-opening stage are: (a) discrepancy in traffic volume forecast, (b) compensation to local communities for the impact of the road, (c) remodeling required in coordination with other organisations and (d) rehabilitation of damage due to natural disasters; there is also a possibility of change in law. These events tend to increase the actual project cost against the planned project cost (Yukia et al).

Standard and Poor's (2014), hereinafter as S&P, have explained the Key Credit Factors that they use for rating road, bridge and tunnel projects for financing purposes. They have classified the lifetime of road projects into two phases viz. (i) Construction and (ii) Operations, for the purpose of rating road, bridge and tunnel project financing. S&P use two major sources of risk factors in the construction phase viz. (a) Technology and design risk, and (b) Construction risk. Further they use two major sources of risk factors in the operations phase viz. (a) asset class operations stability and (b) market risk.

Ministry of Finance, Govt. of India, in its portal on Public Private Partnerships in India (PPPI), classifies risks of road projects executed in the PPP model on the basis of four stages: 1. Pre-operative Tasks Risks, 2. Construction Phase Risks, 3. Operations Phase Risks and 4. Handover Risks. It also identifies a category of 'Other Risk' that cannot be strictly categorised according to the stage of the PPP road projects (PPPI, 2015a). Risks in the pre-operative tasks stage include: (a) Delays in land acquisition, (b) External linkages, (c) Financing risks, (d) Planning risks and (e) Approvals risk. The construction phase is exposed to: (a) Design risk, (b) Construction risk and (c) Approvals risk. Operations phase risks include: (a) Operations and maintenance (O&M) risk, (b) Volume risk, (c) Payment risk and (d) Financial risk.

Other risks considered by PPPI include (a) Change in law, (b) Force Majeure, (c) Sponsor risk, (d) Concessionaire event of default and (e) Government event of default. Change in law is the risk of an adverse change in regulations. Force majeure relates to occurrence of events beyond the control of the public and private partners such that it affects their ability to perform their obligations under the PPP agreement. Sponsor risk is the possibility that sponsors will not be in a position to deliver the project due to some unforeseen reason. Concessionaire event of default arises due to the possibility that the sponsor will default on its contractual obligations and the government will not be able to enforce the same against the sponsors or recover any compensation from the sponsor. Government event of default arises out of the possibility that the government will default on its contractual obligations and the sponsor will not be able to enforce the same against the government or recover any compensation from the government.

The risk frameworks suggested by various authors and agencies appear to be comprehensive enough to capture all possible types of risks. However delays related with litigations and court interventions do appear unabatedly in the media. The events of litigation or legal issues may arise either against parties inside or outside the project relationships. Moreover instances of loss of revenues due to inappropriate location of toll plazas or due to removal of toll plazas by court order are not rare and also are not adequately captured by the frameworks discussed earlier. Unlike the above risk frameworks that are based on the

phase or stage of the road project, litigation or legal issues may not strictly be associated with the phase of the road project. Moreover events such as loss of revenues due to inappropriate location of toll plazas or due to removal of toll plazas by court order are also not adequately captured in the frameworks discussed earlier. Such events could occur due to various possible reasons and during any phase of the road projects.

This inconsistency between the academic understanding of risk frameworks for road projects and performance of road projects in real life makes an obvious reason for refining the existing risk frameworks further. Thus, through three case studies we attempt to investigate those risks which might not be captured appropriately by the existing frameworks in order to arrive at a refined risk classification framework.

Research Methodology

The study attempts to further improve upon the existing frameworks of risk factors in case of road projects in India. A qualitative research design would be most appropriate (Marshall and Rossman, 1995), if the researcher intends to:

a. Understand the in-depth processes that operate within the organization or industry.

b. Research issues involving poorly understood organizational phenomena and systems.

c. Study differences between stated organizational policies and their actual implementation.

d. Discover new or thus far unspecified variables.

The case method, a qualitative research technique, is used as the study is focussed on two (b and d) of the four above-mentioned intentions. The study intends to see whether the risk factors in road projects can be adequately mapped by the existing frameworks. Based on insights drawn from three case, the study has contributed to further enrich the existing literature on understanding risk factors in road projects and hence consequences and financing implications.

The cases of road projects have been selected keeping in view the following:

- It was executed by public and private sector participation.
- It has been seriously affected by legal issues and litigation.
- It has suffered substantial delays and overrun of costs.

Based on above criterion, the list of three cases identified is given below. The data about the cases were collected from secondary sources.

- Panipat-Jalandhar Highway Project,
- Bandra-Worli Sea Link and
- Delhi-Gurgaon Expressway Project.

Cases in Road Projects in India

Panipat-Jalandhar Highway Project

This project involves six-laning of the Panipat-Jalandhar section of National Highway 1 (NH-1), which was earlier a four-lane highway. This project is part of the fifth phase of the National Highway Development Programme (NHDP) of National Highways Authority of India (NHAI). It covers a distance of 291 km of which 116 km fall in Haryana and 175 km fall in Punjab. This section of NH-1 passes through four districts in Haryana: Panipat, Karnal, Kurukshetra and Ambala; and five districts in Punjab: Patiala, Fatehgarh Sahib, Ludhiana, Jalandhar and Kapurthala.

The concessionaire of the project was Soma-Isolux NH One Tollway Private Limited, a consortium of two entities: the Spanish company Isolux Corsan and the Indian company Soma Enterprises Limited. The concessionaire was awarded the contract for executing the project on May 9, 2008. As per the concession agreement the project was supposed to be executed on Design-Build-Finance-Operate (DBFO) basis and the concession period was of 15 years during which time the concessionaire was allowed to collect toll. The construction work was supposed to be completed within a period of 30 months, from May 2009 to November 2011.

However the concessionaire was not able to complete the project and missed three deadlines, the last one being June 15, 2012, due to which the concessionaire became involved in serious litigation with NHAI (Project Monitor, 2014). The Punjab and Haryana High Court had directed the NHAI to take over the Panipat-Jalandhar Highway Project on NH-1 from the concessionaire because it had failed to complete the project by 2012. However the intervention of the Supreme Court allowed the concessionaire to continue with a fresh deadline to complete the remaining work (The Pioneer, 2013).

The Tribune (2014) had reported that the concessionaire was collecting toll at the Karnal barrier without satisfying the condition of six-laning of the Panipat-Jalandhar highway. The concessionaire had been contracted for six-laning and maintenance of the Panipat-Jalandhar stretch on NH-1. The project was supposed to be completed within a period of 30 months starting from May 11, 2009. Further as reported a query under the Right to Information Act (RTI Act) had revealed that the toll plaza at Karnal had been set up on May 11, 2009 and was supposed to continue for a period of 15 years (The

Tribune, 2014). It had already collected toll revenues amounting to Rs. 653.38 crores over a period of five years, which was more than one-third of the estimated project cost.

Hindustan Times (2014) had reported that the concessionaire had been permitted to collect toll to recover its construction cost from May 2009 onwards. The deadline was extended to March 31, 2013 and the concessionaire had failed to meet even the extended deadline. Following this a new deadline was set for completing the remaining work of the project (assessed to be 29 percent) by March 31, 2015. It was further reported that the representatives of the concessionaire were blaming on several factors as being the reasons for the delay. The main reasons were gaps in the locations of the toll plazas and poor availability of construction material due to a ban on mining. This apart there were delays in land acquisition process, shifting of utilities and removal of encroachments. The project cost was estimated to be Rs. 2747.5 crores on March 30, 2009 and as on September 2014 the cost had escalated to Rs. 4518 crores. The main cause of the cost escalation was attributed to the delay (Hindustan Times, 2014). Moreover the concessionaire had alleged incurring massive losses because the commuters were avoiding the existing toll plazas (The Pioneer, 2013).

The above information reveals several aspects of this project. Firstly the concessionaire was allowed to collect toll from the very beginning even when no progress had been made. This was probably because of the reason that the project was to be executed on DBFO basis; so the amount invested in the construction work had to be recovered by collection of toll revenues. Secondly as reported earlier the concessionaire had alleged that it was incurring massive losses because the commuters were avoiding the toll plazas and there were gaps in the location of the toll plazas. Thirdly due to the delay in making progress on the contract there was litigation between the concessionaire and the government agency, NHAI, which resulted in an order passed by the High Court directing NHAI to take over the project from the concessionaire – however subsequently the Supreme Court had intervened on the same.

Fourthly the availability of construction material was poor due to a ban on mining – the inadequate availability of the construction materials would have further slowed down the progress resulting in delays. Fifthly there were delays in land acquisition process, shifting of utilities and removal of encroachments, all of which had contributed to the delay. Thus we can see that there were multiple factors that were working against the implementation of the project from its initial phase resulting in delays. The consequence of all these factors was protracted delay, which happened while the concessionaire was collecting toll as per the agreement; as a result the project failed to fulfill the completion deadlines time and again.

Moreover there was at least one factor – inappropriate location of the toll plazas and gaps between them, because of which the commuters could avoid payment of toll charges resulting in substantial loss of revenues and cash flows. Thus it can be seen that there were multiple risk factors that were affecting the project from its inception; some of the risks such as the loss of toll revenues which would have arisen in post-construction or operations phase (as in the frameworks discussed above) had affected the project from its beginning.

Bandra-Worli Sea Link (BWSL)

Bandra-Worli Sea Link (BWSL) is a part of the Western Freeway Sea Project, the purpose of which is to improve road transportation network of greater Mumbai (HCC whitepaper). In its first phase it was supposed to connect Bandra with Worli and in its subsequent phases it is supposed to be extended further to Haji Ali and to Nariman Point. It was meant to be an alternative to the Mahim-Causeway route, which was the only linkage between South Mumbai and the suburbs in the Western and Central regions.

The BWSL project consisted of the bridge from Bandra toll to Worli sea face and approach roads and traffic dispersal mechanisms. The sea link was supposed to reduce travel time between Bandra and Worli, and to connect the western suburbs of Mumbai with its main commercial centre. Commissioned by the Maharashtra State Road Development Corporation (MSRDC) and the Maharashtra Govt., the project was constructed by the Hindustan Construction Company (HCC).

The project was supposed to result in estimated savings in vehicle operating costs of Rs. 100 crores per annum and savings in travel time (MSRDC website, 2015). A host of other benefits were stated such as reduced traffic on existing roads and reduced accidents, and reduced pollution levels on the existing roads. It was further stated that there would be no adverse impact on marine life or on the economic well being of fishermen in the area whose livelihood depended on the sea.

The project had been facing multiple problems ever since its inception. There were allegations of adverse impact on environment which included endangerment of protected species (mangroves) by illegal felling of trees and possibility of erosion of coast due to change in the direction of waves. Other allegations included human rights violation due to the impact of reclamation on the livelihood of local communities of fishermen, violations of environmental laws such as incomplete environmental impact assessment, no public hearing, CRZ violations,

illegal quarrying and many others. Additionally, the project had suffered from both time overrun and cost overrun.

An enquiry by The Indian People's Tribunal on Environment and Human Rights, IPT (2001), stated that legal requirements were not fulfilled by the BWSL project. The enquiry document stated that the execution of the BWSL project had made several violations as follows:

1. The Environmental Clearance was given to the project without holding mandatory Public Hearing.
2. The Environmental Impact Assessment (EIA) was incomplete because the relevant documents were not made available for inspection to the IPT panel or the other concerned parties.
3. There was a lack of transparency in passing and implementing the project because several reports related with the BWSL project were not made available.
4. There had been Coastal Regulation Zone (CRZ) violations by the project because the status of the reclamation and relevant information has not been provided.
5. There had been violation of the quarrying norms because the construction material was obtained from a quarry which fell within a 'No Development Zone'.
6. The fishermen affected by the project were neither consulted nor was their consent obtained. On this issue the IPT enquiry document also claimed that there was violation of right to livelihood of the fishermen and it also extended the argument to state that there was violation of fundamental right to life (which includes the right to livelihood).

The sea link was constructed with an expected traffic of 65000 vehicles per day as estimated in 2009. However, monthly data from August 2012 to November 2013 indicated that the average daily traffic was between 45000 to 55000 vehicles. As reported this shortfall was due to the reason that another route, the Eastern Freeway, came up later and became operational from June 2012. A significant portion of the traffic which earlier passed through the BWSL started using the freeway. The freeway did not exist when the sea link was planned. (The Indian Express, 2014).

Moreover the sea link project was delayed due to serious differences between the contractor, Hindustan Construction Company (HCC) and the MSRDC over escalation of project cost. Due to the delay the cost of the project more than doubled from an initial estimate of Rs. 660 crore to a revised estimate of Rs. 1330 crore (The Economic Times, 2004)

The above discussion on this case reveals several risk factors that had affected the implementation of the project. One of the major factors was the occurrence of multiple legal issues as is revealed by the enquiry document of IPT. These legal issues would have arisen due to various reasons as stated in the enquiry document, some of which were related with environment, some with transparency of the procedures and sharing of information, and some were related with human rights.

The second major source of risk was an alternative route (the Eastern Freeway) coming into existence after the original project was implemented. This would have directly affected the economics of the project because it had impacted the actual usage of the services of the project. The next major issue was the occurrence of differences with the project contractor over cost escalation which led to delay in the implementation and operation of the project. This delay ultimately resulted in serious cost overruns which can have multiple consequences. One of the direct consequences would be on financing the overrun. The other would be whether and to what extent the overrun could be passed on to the pricing of the service (toll charges), which might be debated by those are affected and the society at large. However there are no clear evidences on these consequences.

Delhi-Gurgaon Expressway Project (DGEP)

Under DGEP, which connects Delhi and Gurgaon, and is a part of the Golden Quadrilateral Project, it was proposed to convert a section of 27.7 km of the National Highway 8 (NH-8) that connects Delhi and Gurgaon, from the then existing 4 lane to 6/8 lane (PPPI, 2015b). This section of the highway experienced high vehicular density and non-segregation of traffic due to which there were many accidents, traffic congestion, fuel wastage and high vehicular pollution. The concessionaire of this project was Delhi Gurgaon Super Connectivity Ltd. (DGSCL), a consortium of Jaiprakash Industries Ltd. and DS Construction Ltd.

The project was awarded on Build-Operate-Transfer (BOT) basis. The concession period was 20 years which also included the construction period. Under the concession agreement DGSCL was supposed to design, construct, operate and maintain the expressway as per the specifications of NHAI. This project was awarded on a negative grant basis under which the concessionaire had offered to pay a fee of Rs. 61.06 crore to NHAI upfront. The expressway was completed and opened in January 2008 after a long delay which was mainly caused due to issues in land acquisition and changes in scope of work (PPPI, 2015b).

At the time of financial closure on May 9, 2003 the project was funded by a mix of debt of Rs. 383.3 crore

and equity of Rs. 164.2 crore (PPPI, 2015b). The main lender was Housing and Urban Development Corporation Ltd. (HUDCO) which had lent Rs. 200 crore. The other lenders were State Bank of Mysore, Punjab National Bank, Srei International Finance and Jammu and Kashmir Bank, LIC and UTI Bank. The project was completed at actual cost of Rs. Rs. 1175 crore vis-à-vis the original outlay of Rs. 547.5 crore as per the financing structure at the time of financial closure. The cost overrun was financed by the private parties involved and partly by NHAI for changes in the scope of work.

There were three toll collection points on this expressway – toll plaza near the Indira Gandhi International Airport (IGIA), toll plaza at Kherki Dhaula and toll plaza at Sirhaul. The toll plaza at Sirhaul was a major cause of traffic problems and public inconvenience. As reported by The Economic Times (2014) the Delhi High Court had ordered for the removal of the toll plaza at Sirhaul. Following this the toll rates at the toll plaza at Kherki Dhaula were supposed to be revised.

The judgment of the Delhi High Court ended about two years of litigation. There was a lengthy legal dispute between the concessionaire DGSCL and NHAI after the latter served a termination notice to DGSCL for non-performance of duties under the contract due to which there was serious public inconvenience at the toll plaza. The Delhi High Court also directed Infrastructure Development Finance Company (IDFC) to take over the Delhi-Gurgaon Expressway Project.

IDFC was the lead lender in the consortium lending arrangement involving several banks including Punjab National Bank, Oriental Bank of Commerce and State Bank of Bikaner and Jaipur (Business Standard, 2014). The lenders were supposed to appoint a new concessionaire after taking over the project. Under the settlement plan the earlier concessionaire, DGSCL had to withdraw its claim of an amount close to Rs. 990 crore due to a change in the scope of work. Moreover even after its removal DGSCL (or DS Construction Ltd.) would remain liable for any past liabilities which pertain to the period when it was the concessionaire. As a consequence of the High Court order for removal of the toll plaza there would be a loss of major portion of the toll revenues (estimated to be around 60 percent). It was also reported that a large portion of the employees under the project were likely to lose their jobs after the removal of the concessionaire as the lenders would retain a smaller portion of the work force.

Moreover the MRTPC had also initiated investigations on the Delhi-Gurgaon Expressway due to the poor facilities (The Economic Times, 2008) because an investigation for unfair and restrictive trade practices was ordered under the MRTP Act. Earlier it had been claimed that the expressway would substantially reduce the travel time between Delhi and Gurgaon. However, the commuters had to wait for very long times in que at the toll plaza.

So this case reveals that after the project was initiated it was affected by at least five risk factors which were very apparent. Firstly it was affected by issues in land acquisition which resulted in delays. Secondly it was affected by change in scope of work which result in both delays and increase in costs. Thirdly it was affected by legal issues with the regulator on trade practices (MRTPC). Fourthly it was affected by litigation with the government agency for highways (NHAI). Fifthly it was affected by the loss of revenues due to removal of toll gates by the order of High Court because of public inconvenience.

The cost overrun led to the problem of funding the overrun, which in this case was borne mainly by the private parties and partly by NHAI. Any loss of revenues as it happened in this case due to closure of the toll plazas, would affect the debt service capacity of the project and hence the interests of the lenders. Further any loss of employment after the replacement of concessionaire might have further financial implications for the project in terms of payment of compensation to those who would lose their employment – this might have further pressure on financing requirements. However there is no information available on these matters.

Discussion and Revised Framework

The analysis of three road projects indicates that a generalisation of all risk factors cannot be made for projects. Road projects tend to have uniqueness in their characteristics depending on their location, the interaction between the parties involved, response of the society to their services and response of the regulators to their services. The risks faced by the road projects arise out of their uniqueness of characteristics as evident in three toll road projects discussed earlier.

These risks may be classified into categories based on their nature but such a classification in every case may not be strictly based on the phases which a road project undergoes. For instance the following risks were found in the three toll road projects studied earlier:

(a) **Weaknesses in the toll collection process:** The example here is the inappropriate location of the toll collection points and the gaps between the toll plazas in case of Panipat-Jalandhar Highway project, which led to loss of revenues by the inability of capturing the toll fees.

(b) **Emergence of an alternative route after the road project is initiated:** This was observed in case of Bandra-Worli Sea Link project where the Eastern Freeway came up after the sea link project was

implemented. This led to loss of potential toll revenues.

(c) Differences / Litigation with parties inside project relationships: This was observed in case of Bandra-Worli Sea Link where there were differences between project contractor, HCC, and MSRDC over escalation of costs. These differences resulted in delays in project completion. This was also observed in case of Delhi-Gurgaon Expressway project as well as Panipat-Jalandhar Highway project.

(d) Differences / Litigation with parties outside project relationships: This was observed in case of Delhi-Gurgaon Expressway project, wherein an investigation for unfair and restrictive trade practices was initiated by the MRTPC under the MRTP Act. This was also observed in case of Bandra-Worli Sea Link project in which there was litigation with IPT which alleged that the project had made multiple violations.

(e) Public inconvenience: This was observed in case of Delhi-Gurgaon Expressway project. In that case public inconvenience resulted in court order for removal of toll collection points as a consequence of which there was loss of toll revenues.

Unlike the classification of the risk factors in terms of the phase or stage of road project the above, same risks cannot be strictly classified into specific stages. As per the risk classification framework of PPPI the risk in (a) above, weaknesses in the toll collection process, observed in the case of Panipat-Jalandhar Highway Project, is likely to be faced in the operation phase and not in the construction phase (as per the PPPI classification). However in that project the concessionaire was allowed to collect toll from the inception, even when the construction work was in its early phases. The risk in (b) above, emergence of an alternative route, has been mentioned and classified in the operations phase by S&P (2014). Indeed the available evidence shows the same in the operations phase; however the same could have occurred while the construction phase was underway.

Differences / litigation with project contractor and government agency which resulted in delays (the risk in (c) above) happened in case of Bandra-Worli Sea Link – there were differences between HCC and MSRDC over cost escalation. This occurred during the construction phase of the project. This also happened in case of Delhi-Gurgaon Expressway project and Panipat-Jalandhar Highway project. However, none of the risk classification frameworks referred in the literature survey specifically provides for this type of risk. The risk in (d) above, differences / litigation with parties outside project relationships, was observed in Delhi-Gurgaon Expressway Project and Bandra-Worli Sea Link project. However this risk factor is not clearly provided for in the risk classification frameworks of S&P (2014) and PPPI (2015a).

Similar observations can be made with reference to the risk covered in (e) above, public inconvenience resulting in court order for removal of toll collection points. This risk factor was observed in the Delhi-Gurgaon Expressway Project and it resulted in loss of revenues from the project. However, the risk classification frameworks of S&P (2014) and PPPI (2015a) do not provide for this risk. The framework formulated by Yukia et al (2005) uses a factor, formulation of a consensus, in each of the five stages of road projects, might be said to represent the factors (c), (d) and (e) above only in an indirect manner.

The above discussion shows that the framework for risk classification, as referred to in the literature earlier, may not be sufficiently exhaustive to capture all types of risk factors. As observed in the cases above there could be risk factors that might not fit into the classification. The factors in (c) and (e) above collectively represent contentious issues – such issues may or may not take the form of litigation or court order.

On the basis of the evidences found in the three cases discussed earlier, a revised framework of risk classification is being proposed for the road projects. Specifically, it is attempted to further improve upon the framework given by PPPI (2015a) in the light of the evidences found. The risk factors thus identified are presented below in table 1.

Table 1: Revised Framework of Risk Factors

I. Risks which are associated with the phase of the project as categorized by PPPI (2015a)
a) Pre-operative task risks: Delays in land acquisition, external linkages, financing risks, planning risks, approvals risk.
b) Construction phase risks: Design risk, construction risk, approvals risk.
c) Operations phase risks: Operations and maintenance risk, volume risk, payment risk, financial risk.
d) Handover risks: Handover risk, terminal value risk.

I. Risks which are not associated with the phase of the project As categorized those risk factors classified as 'Other Risks' by PPPI (2015a) and additionally the *risk factors which have been identified in this study*
a) Change in law b) Force majeure c) Sponsor risk d) Concessionaire event of default e) Government event of default f) Weaknesses in the toll collection process: Improper location of toll collection points, defects in toll collection mechanism. g) Emergence of alternative route after the road project is initiated. h) Differences / litigation with parties inside project relationships i) Differences / litigation with parties outside project relationships: j) Public inconvenience

It can be seen from the modified classification of risks that the second category which consists of risks that are not associated with the phase of the project consists of a heterogeneous group of risk factors. Moreover this category has a higher weightage of risk factors that represent contentious issues: (d), (e), (h), (i) and (j).

The understanding of the risk factors affecting road projects based on literature and the evidences from the three road projects in India, leads us to an assessment of the consequences of the risk factors. Such an assessment of the consequences would help us in identifying an appropriate mechanism for dealing with the risk factors so that the losses can be contained and the deviation of the road projects from the planned costs and time frames could be minimised.

Consequences of the Risks Factors

The study of the risk factors based on the available literature and the three cases cited above serves as the basis of identifying the major consequences of the risk factors affecting the road projects. The consequences that appear to be most obvious include delays, increased costs, decline in revenues, financial consequences of differences / litigation with parties inside and outside of project relationships

Delays arising in any stage of the project or due to any risk factor tend to extend the time period of completion of the project and its availability for delivering the required services to the end users. It also results in increased costs because the costs which are fixed over the term of the project would be incurred over an increased period of time. This apart delayed completion clearly implies a delay in the commencement of operations as a result of which there would be a delay in the generation of the cash inflows from the operation of the road project and hence a delay in the recovery of expenditures incurred leading to lower returns realised by the project sponsors.

All the three cases discussed earlier provide evidence of occurrence of delays resulting from multiple factors. However the impact of the delay on the generation of operating cash inflows would be different in different cases. As found in the case of Panipat-Jalandhar Highway Project the concessionaire was allowed to collect toll from the beginning and had actually mobilised revenues without making significant progress in the project work. The fact that delays result in increased costs is evidenced by all the three cases.

In the case of Panipat-Jalandhar Highway Project the estimated outlay was Rs. 2747.5 crores on March 30, 2009 and by September 2014 the cost had escalated to Rs. 4518 crores. In the case of Bandra-Worli Sea Link Project the costs had escalated from an initial estimate of Rs. 660 crore to a revised estimate of Rs. 1330 crore (The Economic Times, 2004). The Delhi-Gurgaon Expressway Project was commissioned in January 2008 after much delay resulting from various issues; the actual cost of the project turned out to be Rs. 1175 crores compared to the initial outlay of Rs. 547.5 crores.

Increased costs pertain to either increase in capital expenditures or increase in operating expenses during the operations phase of the road project. In all the three cases at least some portion of the overall increase in costs can be attributed to the delay in the execution of the projects. Capital expenditures might increase due to the impact of various risk factors described earlier such as design changes and costs of redesigning, technological changes, increase in compensation for the acquired land, increased fixed costs incurred due to unforeseen delays, unexpected inflation in costs or other reasons. At least in the case of the Delhi-Gurgaon Expressway Project there was change in the scope of work which implies increased expenditure on design changes. The case on the Delhi-

Gurgaon Expressway Project, there were significant changes in the original design as required by NHAI and the government taking into consideration future needs and the convenience of the end users. However in this case a portion of the cost overrun was funded by NHAI for change in the scope of work; indeed this would have protected the private parties from being affected by the overrun but ultimately the government agency had to bear the increased expenditure due to change in scope of work. Operating expenses would increase over time due to the impact of inflation. There would be adverse impact of increased operating expenses if the actual inflation in the various components of operating costs tends to exceed the projections in operating expenses and the toll revenues do not increase at the same rate as the operating expenses. The ultimate impact of both will be on the realised returns of the project sponsors.

Decline in revenues would generally occur during the operations phase if the projections have been inappropriately made in the financial analysis of the project or there are substantial changes in the business environment from the assumptions made in the financial plans. There are clear evidences on decline in the actual volume of traffic in the case of Bandra-Worli Sea Link and Panipat-Jalandhar Highway Project. In the former case the original estimate was of 65000 vehicles per day in the year 2009 whereas the actual volume of traffic was between 45000 to 55000 vehicles per day during 2012-13, significantly less than the original estimate. This decline was attributed to the development of another route, the Eastern Freeway, which came up later and became operational from June 2012.

In the case of Panipat-Jalandhar Highway Project there was substantial loss of revenues because there were gaps in the location of the toll plazas and the commuters were avoiding them resulting in substantial loss of revenues. In the case of Delhi-Gurgaon Expressway Project the actual traffic volume after the project became operational was significantly more than the original estimates (PPPI, 2015b). However in this case the loss of revenues occurred to due to the removal of the toll plaza by court order; the loss of revenues was estimated to be around 60 percent (Business Standard, 2014).

The financial consequences of legal issues with parties inside the project relationships would be generally in the form of expenditures on litigation with the project related parties for either actual or perceived violation or non-fulfillment of the terms of the agreements. There are evidences of litigation with parties within the project relationships in all the projects. As observed in the case of Panipat-Jalandhar Highway Project, the litigation was mainly between concessionaire and the government agency NHAI because the former party had missed several deadlines for completing the project. In this case due to the legal issue the Punjab and Haryana High Court had earlier ordered NHAI to take over the project. However, later on the Supreme Court had intervened on this judgment.

Also in the case of Delhi-Gurgaon Expressway Project there was litigation between the concessionaire DGSCL and NHAI for non-performance of duties under the contract. In this case the legal issue ended when the court ordered the lenders to take over the project by replacing the concessionaire. The main financial consequence for the concessionaire and the sponsors was that the concessionaire lost the right to collect toll on the project resulting in a loss of the revenue stream. Further The Economic Times (2014) had reported that as part of the settlement of the litigation the former party had to withdraw claims of Rs. 988 crores.

Some *legal issues with parties outside project relationships* and the financial consequences resulting from the same could arise due to various reasons which might have missed the attention while planning and executing the road project. Evidence of legal issues with parties outside project relationships was observed in the case of the Bandra-Worli Sea Link project. As explained earlier the IPT tribunal had alleged multiple legal violations by the project. As stated in the IPT enquiry document (2001) the Environmental Clearance was obtained without any Public Hearing and the Environmental Impact Assessment was incomplete. It was further alleged that there were Coastal Regulation Zone (CRZ) violations and there was violation of quarrying norms.

The violation of the quarrying norms was indeed an interesting issue raised in this context because the contractor was issued quarrying permit for an area which fell within a 'No Development Zone'. This apart the IPT enquiry document also claimed that there was violation of right to livelihood of the fishermen who were dependent on the sea in that area. Moreover in the case of Delhi-Gurgaon Expressway Project there was legal issue with the regulator MRTPC because it had ordered in investigation on the project on unfair trade practices. However in these two cases of litigation with parties outside project relationships there is no available information on the financial consequences. The financial consequences of legal issues with parties outside project relationships would not have any pre-determined basis such as contracts and agreements and will be entirely determined as per the judgment of the arbitrator.

Implications for Financing of Road Projects

Delays that occur before the construction phase will cause a delay in getting the financing commitments from

institutional lenders or passive equity investors or other sources of financing. If the sponsors have already committed their funds for carrying out the planning processes such as technical, legal or other studies then such delays would imply that the sponsors' funds would remain blocked resulting in a decrease in their realised return. The uncertainty in getting the financing commitments from the external lenders or investors would in turn cause a delay in the commencement of the construction phase resulting in delays in all subsequent phases and decrease in realised returns by the sponsors. Finnerty (2014) explains that construction activities cannot commence until financing commitments for completing the entire project is obtained by sponsors from institutional lenders and investors. Further delays, which generally lead to cost overruns, would affect the economics of the road project resulting in the inability of the sponsor to arrange for subsequent financings.

Delays occurring during the construction phase of the road project would again affect the financing arrangements because the drawdown of funds from both debt and equity sources depend on the schedule of construction activities. Any delay occurring during this phase would imply unexpected wastage of funds by payments of commitment charges to lenders. Since the initial financing arranged includes the amount to be paid as commitment charges as well as the interest charges this means that during such delays the project would be incurring both interest and commitment charges. This would lead to a shortfall of funds when the construction activities resume. As a result the sponsors would be forced to arrange for unplanned short term financing at higher cost to meet the funding gap. This apart such delays could also imply a temporary delay in funding from the passive equity investors or would require additional funding from sponsors.

Increase in costs at any stage which are of the nature of capital expenditures or otherwise need to be capitalised would cause an increase in the total outlay for the road project. Since the amount of financing required depends on the total outlay of the project such unexpected or unplanned increase in the outlay would result in an uncertainty with respect to the financing commitments from potential sources. It is already explained above that construction cannot be begun until the sponsors are able to arrange for financing commitments for the entire funds required for completion of the project (Finnerty, 2014). So any unplanned increases in capital outlay would lead to uncertainties in getting the financing commitments which in turn would result in a delay in the commencement of construction activities. So it can be understood that just as delays could lead to cost overruns so would increased costs lead to delays in the progress of the project. Thus both delays and increase in costs can lead to one another because of the dependency on financing arrangements.

Moreover, for infrastructure projects, debt financing is generally not available in the form of a single arrangement that covers the entire lifetime of the project. Typically the road project would have separate financing arrangements for the construction phase and for the post-construction (operations) phase. Any delay in the completion of construction would increase pressure on the sponsor to repay the loans taken for the construction phase by arranging for refinancing, which might be expensive. Moreover, the financing for the post-construction phase, typically referred to as permanent financing, would not be available unless the construction phase is completed to the satisfaction of the concerned parties and the project is commissioned.

Decline in revenues during the operations phase of the road project would impact the debt service capacity of the project. Infrastructure projects generally arrange for supplemental credit support mechanisms for dealing with such adverse developments. In case such arrangements are not there a situation of financial distress would arise which may necessitate restructuring of debt. Unforeseen liabilities whether arising out of legal issues with parties inside the project relationships or outside would result in an unexpected need for additional financing and increased financing costs. Further such unexpected additional financing would cause deviations from the financing plan of the project which in turn could either affect the financial risk or the cost of capital of the project. If such additional financing is carried out by additional borrowing then the exposure to financial risk would increase. If it is done by infusing more equity then the cost of capital would increase and return on equity would decrease.

The discussion on the consequences of risk factors and their implications for financing of road projects is summarized in the Table 2 below. This table would help in quickly correlating the consequences and their implications for financing and would serve as a tool for inducing the sponsors and related parties to put in place measures for risk mitigation. This table would also serve as a guiding mechanism to banks and financing agencies, who might be considering proposals for financing of road projects.

Table 2: Consequences of Risk Factors and Implications for Financing

Consequences	Implications for Financing
Delays before construction phase	Delays in financial closure with various parties providing financing Blocked equity funds provided by sponsors or others Decrease in realised return on equity Delay in getting loans Delays in commencement of construction
Delays during construction phase	Commitment charges as well as interest are payable to banks although construction work will get delayed Shortfall in availability of funds that were planned initially Need to arrange for sudden bridge financing to meet any shortfall of funds Increased pressure for refinancing arrangements Delay in getting financing during the operations phase
Increased costs	Increase in total outlay of project Uncertainty and delays in the availability of financing Delay in completion
Decline in revenues	Impact on the debt service capacity of project Possibility of financial distress
Financial consequences of differences / litigation with parties inside or outside project relationships	Unforeseen liabilities leading to unexpected need for additional financing Increase in cost of financing Increase in financial risk if debt financing is availed Decrease in return on equity

Conclusions

The overall success or failure of the project would depend on the severity of risk factors and their consequences and to the extent the project is able to adjust. The financial consequences would differ in terms of the nature and magnitude of the road projects. The financing of road projects typically involves allocation of risks to various parties involved. However, the proper and justified allocation of risks is a herculean task as the impact of some of the risks may be too high to be borne by an individual party. This necessitates for handling contingencies and their financial consequences through a financing mechanism rather than through allocation of risks to specific parties only. Hence there is a need for a contingency financing mechanism which would act as a supplemental financial support that would enable the private parties to complete the project and make it operational, so that the road project can render its services without delay and the sponsors can recover their investment with returns.

Such a contingency financing mechanism might be implemented in various ways. There could be a pool of funds created at the national level by regular contributions from both government sources as well as from those road projects which are operating profitably. The corpus thus created can be used for contingency financing of road projects which might be held up due to lack of funds as a result of the impact of various risk factors. The contingency financing, however, should be governed by transparency and set prescribed terms and conditions.

The financing from the contingency fund might be in the form of equity contribution to the road project initially. Once the road project comes out of the contingency and starts operating profitably, it can be allowed to buy back the equity contribution made by the contingency fund in a phased manner at a mutually agreed price which enables the recovery of capital provided by the fund along with a return. Those who would contribute to the fund might be given benefits such as tax incentives instead of giving them a direct return. Another variation of the contingency fund could be by taking contributions from all private sector companies involved in the execution of road projects, along with some contribution by the government. The companies which would contribute to the fund would get contingency financing of an amount either equal to the proportion of their contribution or the amount of their requirement, whichever is lower.

Future research in this direction might explore on more innovative contingency financing mechanisms. The idea is to enable the project to come out of the contingency by providing it equity financing for the time it will take to become operational and profitable. In the public private partnership (PPP) model if the concessionaire or the sponsors are left alone to deal with the consequences of the serious risk factors, the private partners would be discouraged to come forward for such projects. Thus in order to sustain a healthy growth of the Indian economy there should be a mechanism that would motivate the private partners by providing support at the time of need. The creation of a contingency fund and the facility of contingency financing would be an important step in this direction.

References

Balachandran, M. (2014). Delhi HC approve IDFC takeover of Delhi Gurgaonexpressway. *Business Standard,* February 19, available at http://www.business-standard.com/article/companies/delhi-hc-approves-idfc-takeover-of-delhi-gurgaon-expressway-114021900979_1.html

Dasgupta, Y. (2014). Delhi-Gurgaon expressway made toll-free following Delhi High Court's order. *The Economic Times,* February 20, available at http://articles.economictimes.indiatimes.com/2014-02-20/news/47527230_1_toll-plaza-delhi-gurgaon-expressway-sirhaul

Finnerty, John D (2014). Project Financing Asset-Based Financial Engineering, 2nd Edition, Wiley-India, New Delhi

HCC (2015). The making of Bandra Worli sea link. *HCC Whitepaper,* February 2, available at http://www.hccindia.com/whitepaper_pdf/Making%20of%20BWSL.pdf

Indian People's Tribunal. (2001). *An enquiry into the Bandra Worli sea link project.* Retrieved from the Indian People's Tribunal website: http://www.iptindia.org/wp-content/pdf/report/An-Enquiry-Into-The-Bandra-Worli-Sea-Link-Project.pdf

Joshi, V., & Rambani, V. (2014). Jalandhar-Panipat 6-laning: Deadlines keep moving. *Hindustan Times,* December 19, http://www.hindustantimes.com/chandigarh/jalandhar-panipat-6-laning-of-nh-1-deadlines-keep-moving/article1-1298108.aspx

Kuber, G. (2004, August 12). Revised Bandra-Worli sea-link plan likely to get nod soon. *The Economic Times.* http://articles.economictimes.indiatimes.com/2004-08-12/news/ 27377587_1_sea-link-concrete-box-girder-bridge-main-cable-stayed-bridge

Maharashtra State Road Development Corporation Ltd. (MSRDC). (2015, February 2). *Bandra Worli Sea Link.* Retrieved from the Maharashtra State Road Development Corporation Ltd. website: https://www.msrdc.org/site/completedProjects/bandraWorli.aspx

Marshall C and Rossman G B (1995). Designing Qualitative Research, Sage Publications, London

Mor, N., & Sehrawat, S. (2006). Sources of infrastructure finance. *IFMR Working Paper Series*.

Phadke, M. (2014). As toll roads face fire, Bandra-Worli sea link struggles for a profit. *The Indian Expres,* May 7. http://indianexpress.com/article/cities/mumbai/as-toll-roads-face-fire-bandra-worli-sea-link-struggles-for-a-profit/

PPPI (2015a). Risk – a critical focus of PPP design. Major risks in infrastructure PPPs. *PPP Toolkit for Improving PPP Decision-Making Processes.* http://toolkit.pppinindia.com/highways/module1-racfopd-mriip.php?links=risk1a, Jan 8

PPPI (2015b). Case Studies: Delhi Gurgaon Expressway. *PPP Toolkit for Improving PPP Decision-Making Processe,* February 7. http://toolkit.pppinindia.com/ports/module3-rocs-dge1.php?links=dge1

Project Monitor (2014,). Work to resume on Panipat-Jalandhar six-lane Expressway, April 21, http://www.projectsmonitor.com/daily-wire/work-to-resume-on-panipat-jalandhar-six-lane-expressway/

Standard & Poor's Rating Services. (2014). Key credit factors for road, bridge and tunnel project financing. Ratings Direct, September 16, pp. 1-18.

The Economic Times (2008). Facilities under Delhi-Gurgaon expressway under probe, Feb 19). http://articles.economictimes.indiatimes.com/2008-02-19/news/28436046_1_delhi-gurgaon-expressway-toll-plaza-toll-gates

The Pioneer (2013). SC stays order on Panipat-

Jalandhar highway takeover by NHAI, June 13,

http://www.dailypioneer.com/nation/sc-stays-order-on-panipat-jalandhar-highway-takeover-by-nhai.html

The Tribune (2014). Incomplete Panipat-Jalandhar road taxing for commuters, December26,http://www.tribuneindia.com/news/haryana/incomplete-panipatjalandhar-road-taxing-for commuters/22556.html

Yukia, S., Keiichi, K and Kazuaki, M. (2005). Quantitative risk analysis of road projects based on empirical data in Japan. *Journal of the Eastern Asia Society for Transportation Studies, 6,* pp. 3971-3984.