

Risk Analysis for a Build Operate Transfer (BOT) Projects

PRATHMESH VILAS PATIL

Principal, G. V. Acharya Polytechnic, Shelu, Tal. Karjat, Dist. Raigad, Maharashtra, India. Pin code 410101.

Abstract:

The growth of the infrastructure sector in India has been relatively slow compared with the industrial and manufacturing sectors. The energy shortage, an inadequate transportation network, and an insufficient water supply system have caused a bottleneck in the country's economic growth. The Build-Operate-Transfer (BOT) scheme is now becoming one of the prevailing ways for infrastructure development in India to meet the needs of India's future economic growth and development. There are tremendous opportunities for foreign investors. However, undertaking infrastructure business in India involves many risks and problems that are due mainly to differences in legal systems, market conditions and culture. It is crucial for investors to identify and manage the critical risks associated with investments in India's BOT infrastructure projects. Based on the survey, critical risks, in descending order of criticality, are identified which are explained below. The measures for mitigating each of these risks are also discussed.

Index Terms: BOT project, risks management, identification; critical risk; risk measurement; uncertainty, Infrastructure projects, Mitigating measures, equity risks

I. INTRODUCTION

The very great economic growth & also development of the country has resulted in a great demand for normal infrastructure, needs & amenities and such as roads, tunnels, power plants, etc. In 1991, after the globalization policy change, India began to find out economical ways, specifically through the Build Operate Transfer projects to found the needs for the country's infrastructure and to be attractive to Private investors. Build Operate Transfer (BOT) has the possibility to be one of the most powerful ways for India to raise funds for infrastructure projects in the near future. It also gives opportunities for other country investors to penetrate into new markets in our country. There may be the use of the BOT scheme or Build Operate Transfer projects have a minimum record around the world and especially short in our country India. Therefore Build Operate Transfer schemes may not be well known and received by other country investors or by the country government peoples handling it. Therefore there are the tremendous opportunities to invest money and time in infrastructure projects in our country India; it is unavoidable that such projects will remain stable in risks and obstructions. Unfortunately, the traditional methods for project risk allocation that are available in other countries, may not be suitable in India because of differences in legal systems, market needs & conditions and culture. In that for the successfully application of Build Operate Transfer schemes in our country India, therefore, investors will need to find out problems and also find various ways to solutions for the critical risks. The purpose of the research is to identify and find out the critical risks associated with India's BOT infrastructure projects; and develops a framework for managing these risks that all parties to BOT infrastructure projects can refer. In the between the 1980s, no. of Asian countries changed their own infrastructure for the development of the country with help of private sector to they identify their problem and try to solve it which obstructions to constrain development & economic growth of the country. The

meaning of private sector management and capital in all infrastructures such as electricity, water, transport, and sewage, and networks was seen as a way of getting and keep working the infrastructural facilities fast available and in low cost those according to culture. Various privatization approaches such as corporatization, public flotation, straightforward sell-offs of state-owned enterprises (SOEs), and so on, became popular type in no. of countries in Asia. One of the best approaches to building new infrastructural amenities and facilities is the build-operate-transfer (BOT) meaning and its working system. In a BOT project, private investors are called the "sponsors" - get a concession for the operate, build, and finance the infrastructure over some limited time, in exchange for the right to charge the users of the facility at a rate which makes the investment in a way that is concerned with buying, selling, and making a profit viable. For the limited time period, the facility is changed over to the state. The visions of the state in a build-operate-transfer style privatization are to get infrastructural amenities and facilities with greater level and fast, without the state taking on the supporter financial responsibility. Build-operate-transfer system needs a facility for the payment for this depends on a commercial, through the applying depends on the "user-pays" principle. Private investors take on the long-term probability for the developing, financing, and controlling infrastructural amenities and facilities depends on potential-commercial-benefits.

II. IMPORTANCE OF THE STUDY

BOT scheme is a flexible one, which can be used for financing infrastructure projects in diverse sectors. But to do that the Government and the Investors need to understand the basic requirement of the scheme. Also, they have to understand different types of risks involved when projects are in construction stage and projects after construction stage. Study of risks which can be involved & their management is then pre-requisite for number of construction projects & can significantly rewards to the all parties if they play their role in risk reduction. Risk management can provide greater certainty in carrying out construction by identifying risks that otherwise might escape from notice and result in a complex problem. Study of risks, Risk Analysis and Risk Management necessitate a sensible and practical approach, aided by a variety of tools and techniques. These should be carried by those who have experience and knowledge of BOT projects. The projects thesis aims to address the different risks involved in BOT projects and their management so as to avoid time & Cost overrun.

III. OBJECTIVE OF THE STUDY

The objective of the study is the Built Operate Transfer (BOT), Model. The objective of the study is the risk involved in Build Operate Transfer Project & then forms a rating system.

IV. SCOPE OF THE STUDY

The scope of the study is limited to the BOT projects involved in the highway sector. To have a great preview of these risks in BOT projects by working on a case study on the highway toll projects this has been come under in BOT

basis. The case study would essentially be in the form of the questionnaire survey.

V.NEED OF THE STUDY

As human population is growing at a faster rate, there is an obvious need for housing, industries, transportation, and civic infrastructure facilities, dams, reservoirs, power plants, services etc. which all can be accomplished by the construction activity. With the rapid opening of the economy, it has become imperative on the part of the Government of India to spend more on infrastructure and also open up the infrastructure construction for private investment. Various such projects are in themselves vast and need huge financing. These projects take a long duration of time to complete, generally from 3 to 10 years depending on the project. In the case of BOT projects, initial construction may take 3 to 5 years or even more and the money recovery may take 20 years or more. The magnitude of time, cost and uncertainties involved requires analyzing and asks for a contingency plan to face these uncertainties. Hence construction industry required to tackle such uncertainties and risks to achieve efficiency, economies for their growth and survival; otherwise losses would be incurred and spell doom for those companies. This gives rise to the need for risk analysis and identification to develop and apply risk management techniques when the need arises. This brings into focus the study of risks involved and their management, which if duly catered may reduce the losses and result in the efficient management of the project management technique. With the arrival of new construction technologies and rapid strides in construction of projects, more risks and unforeseen events are created. Such an event requires more challenging tasks for the planner, decision maker, and risk analyst to predict, identify, access and manage them.

VI.METHODOLOGY

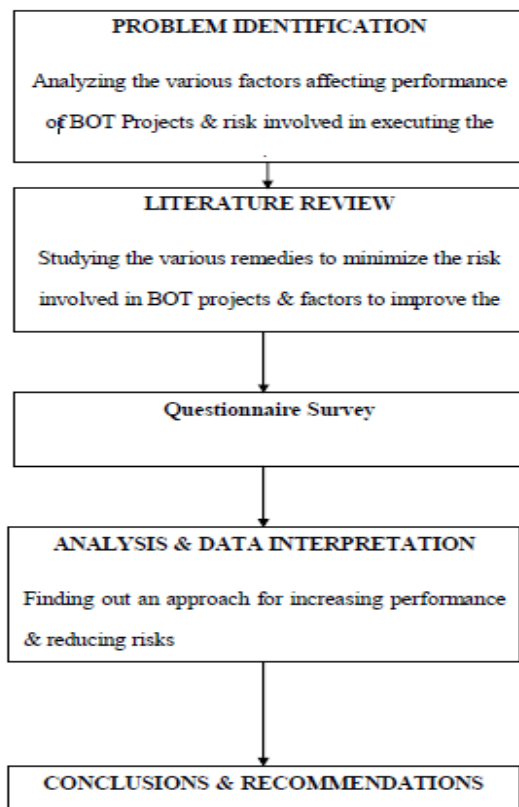


Fig. 1.1 Methodology adopted to study the Risk involved in

1 PROBLEM IDENTIFICATION

In this phase, the problem is identified which is the risk involved in the BOT project especially concerned with the road sector. The problem is identified in this phase and then the literature review is done to foresee the work done by the eminent researcher in the past.

2 LITERATURE REVIEW

In this, the literature available is taken into account.

The literature is reviewed in this case from various sources like:

Journal
Internet.

3 QUESTIONNAIRE SURVEY

With the literature review, the work done by the researcher or student in the past is known. The questionnaire survey is prepared for the concerned authorities in the field which includes Government authorities. The proper mix of the sample studies is done to know the risk involved in the BOT project.

4 ANALYSIS & DATA INTERPRETATION

Since the survey targets were mainly experts in China, and I had already tested it on a small sample of relevant respondents to make sure the survey was respondent's situations and would interpret in the work in same fashion. Data analysis consists of testing, separating, and changing the proof to address the basic levels of the work. In order to generate recommendations, this research project analyzed to date in the following two stages.

- i. Data reduction It is testing, changing, and finalized the data collected from the questionnaire survey and various case studies related to BOT. The main method used was sorting the data into categories according to some criteria which appears to be reasonable based upon prior research.
- ii. Data display In this stage it used tables to display the results of the survey and enhance the understanding of the data.

5 CONCLUSION & RECOMMENDATIONS

After data analysis & interpretation, the probable conclusions were drawn and the recommendations were suggested.

VII.STUDY SYNTHESIS

INTRODUCTION

This chapter defines the need, objectives, importance and scope of the research study.

REVIEW OF LITERATURE

This Chapter deals with the Public Private Participation concept & later on about the BOT projects and the various risks Concept available in the current scenario. It gives a brief glance on the PPP, BOT and Risk involved in Risk Involved in a Infrastructure project.

DESCRIPTION OF BOT PROJECTS

This chapter includes meaning and definition of BOT. Also it gives idea about different parties involved in any BOT

projects. Also importance of BOT projects and advantages of BOT projects is also known from this chapter.

RISKS INVOLVED IN BUILT-OPERATE-TRANSFER (BOT) PROJECTS

This chapter gives idea about different risks involved in BOT project before the start of construction, while construction phase is going on and also when construction phase is over. Also it gives idea which are the different factors affecting risks in projects.

TYPES & SOURCES OF RISK IN BUILD-OPERATE-TRANSFER (BOT) PROJECT

This chapter gives the detailed idea about the Types & sources of Risk in BOT projects, also the participants in project financing, advantages of project financing and the role of public sector in project finance.

CASE STUDY –QUESTIONNAIRE SURVEY

This chapter gives idea about Questionnaire survey done amongst the government employees to rate the risk according to the phases.

CONCLUSIONS AND RECOMMENDATIONS

This chapter after studying above chapters in details and also case study gives conclusion and recommendations of this thesis.

VIII.RISK FACTORS ASSOCIATED WITH A BOT PROJECT

1.Risk before Construction Stage

a)Risk before construction stage involves following:-

Investment Risks Prior to start of project, Land Acquisition/ Resettlement and Rehabilitation delay, Delay in financial Closure Risk & Merit / Approvals Risks.

b)Risk during Construction stage Risk during construction stage involves the following:-

Cost over runs, Time over runs, Drying up of finances during construction, Change in government policies, Problem of law and order, Legal hassles, Constructional bottle necks, Shortage of materials, Import restrictions on Machinery and plant and equipment, Shortage or non-availability of technically competent manpower, Problem in land acquisition, Non-availability of government clearances, Problems created by local influential people, Mobilization problem, Interest rate changes and escalated beyond planned figures & Political uncertainty.

c)Risk after Construction Stage Risk after construction stage involves the following:-

Anticipated revenue not materializing, Non-payment of toll by the users, Other sources of subsidy not yielding the desired profits, Changes in the prevalent laws, Changes in the tax structure, Political uncertainty, Long term economic uncertainty, Devaluation of Rupee.

2.Development Phase Risks

a)Pre-investment risk

It involves the following:-

Pre-Investment Risks for starting of project, Land Acquisition/ Resettlement and Rehabilitation delay, Financial Closure Delay Risk, Merit / Approvals Risks.

b)Resettlement and rehabilitation risk

It involves the following:-

Politically motivated resistance/agitation Resettlement site not acceptable to affected parties, Resettlement site very costly & Public interest litigation/litigation by affected parties.

c)Delay in land acquisition

It involves the following:-

Political interference/patronage, Encroachment problems, Policy restriction for change in land use pattern, Missed out land due to faulty survey and acquisition, Right of way disputes, Public / political interference for changing the scope/ alignment, Very high land cost, Extra land acquisition due to additional approaches/underpasses & Interference of environmental activists Delay due interdepartmental issues (e.g. Highways and Revenue departments) Problems in alienation/physical possession of land.

d)Permit/Approval risk

It involves the following:-

Delay in obtaining utility clearances, Delay in contractual clearances, Delay in project specific orders/ approvals, Delay in statutory clearance (environmental, forest etc.)

e)Delay in financial closure

It involves the following:-

Project not bankable, Lender(s) not comfortable with project viability, Failure to arrange equity in time, High change in the cost of debt, Delay in debt syndication, Risk aversion/apprehension of lenders to BOT financing & Adverse investment climate (legal and regulatory environment).

3.Construction Phase Risks

a)Technology Risk

It involves the following:-

Lack of technical feasibility (in terms of space, time and finance) & Technology failure.

b)Design and latent defect risks

It involves the following:- Design suitability, Loss due to errors and omissions, Loss due to defective design, Mismatching of design and construction methods, Insufficient design documentation, Imperfections in existing structure, Change in soil conditions, Change in design load (future increase in the axle load), Incomplete design scope, Government initiated variations, Change in construction technology induced design changes, Consultant not agreeing to design philosophy, Inadequate code provisions, Incorrect hydrological data and revision in cross drainage design

c)Completion risk

It involves the following:-

Change in scope of project, Delay in intermittent work approvals, Delay in supply of equipment/material labor, Public interference, Failure of subcontractors, Lack of infrastructure services, Delay in obtaining completion certificate, Industrial disputes and labor resistances, Third party delays, Liquidation of joint venture during construction period, Conflicting interests among project promoters, Delay due to dispute among project promoters, Weather variations/natural disasters, Improper scheduling/sequencing of project, Hidden defects in existing structures, Delay in getting land for linking the relocated underpasses, Failure of construction equipment, Delay in notification of orders (tax exemption/equipment import etc.), Delay in project approvals from Government agencies, Delay in obtaining environmental clearances, Delay in opening the road due to non-availability of VIP's or change in Government & Suspension of sanctioned loan by lenders.

d)Cost overrun risk

It involves the following:-

Inflation of cost of materials/equipment labor, Devaluation of currency, Shortage of material/labor, Unexpected subsoil/ground conditions, Change in the scope of project/extra work, Non-political force majeure risks (flood, strike, fire, earthquake etc.), Insufficient information of constructability, Increase in local taxes/charges (entry tax, water charges etc.), Rejection of work by independent consultant/engineer, Ambiguity in the specifications, Decreased labor and equipment productivity risks (flood, earthquake etc.), Third party asset damages, Defective project coordination, Delay induced inflation, Inflated construction cost by contractor who is a member of consortium, Additional cross drainage works due to local public demands, Public initiated additional underpasses/approach roads, Increase in the cost of approach roads/rehabilitation sites, Improper mobilization planning, Uninsured losses, Cartelization by local suppliers, Penalty due to default of obligations set forth in concession, Error in estimates, Error in sourcing the materials Increase in cost of borrowing & Political corruption/party funding.

3.Operation Phase Risks**a)Traffic revenue risk**

It involves the following:-

Non acceptability of toll rate to user, Revenue leakage due to malpractice of operator, Change in tax rates, Development of multi-axle vehicles, Change in traffic mix, Delay in notification of toll fee revisions, Failure of toll collection equipment, Government issued concessions/passes, Agreeing to inadequate toll rate/concession- period, Low predictability of future traffic flows, Revenue loss due to error in traffic sampling, Lack of economic affordability of toll by users, Revenue loss due to uncertain elasticity of demand, Traffic leakage through service lanes, Revenue loss due to scrapping/alteration in tolling system by Government, Traffic revenue loss due to inadequate toll act (lack of toll enforceability), Lack of toll enforceability due to inadequate state Government support.

b)Operational risk

It involves the following:-

Inadequate quality and safety of service, Frequent maintenance due to faculty design/ increase in axle load, Improper estimation for maintenance and operation cost, Wage increases, Increase in cost of maintenance of toll plaza and equipment, Frequent accidents and traffic clearance, Negligence in project operation, Inflated operation/maintenance cost (if operating contractor is a concessionaire), Public interest litigation against operation, Public resistance against toll collection & Failure of operation due to non-political force majeure.

c)Demand/Market risk

It involves the following:-

Development of alternate routes, Over estimation of socio-economic development of the influencing zone, Short fall in the traffic due to recession, Demand elasticity (reduction in traffic due to toll), Change in import policy of motor vehicles, Changes in demographic profile, Failure of linked infrastructure (feeder roads), Inability to meet the increase in demand (capacity constraint), Development of alternate transport modes (pipeline/railway line, waterways etc.), Capacity constraints on feeder roads/road leading in and out of the project road, Economic recession in the influencing zone & Deterrent for traffic due to presence of check posts on project roads.

d)Debt servicing risk

It involves the following:-

Cash flow inadequacy to meet debt servicing due to traffic revenue decline, Sudden change interest rate, Capital shortage due to sudden increase in operation and maintenance costs, Inadequacy of cash due to increase in taxes, Default in debt repayment due to faulty escrow provisions, Inadequate cash flow due to faulty debt servicing structure/ due diligence, Cash inadequacy due to change in exchange rate & Diversion of revenue to sister concerns.

4.Project Life Cycle Phase Risks**a)Legal Risk**

It involves the following:-

Change in obligation under legal framework, Delay in dispute resolution, Conflicting national and state laws, Probity of the various parties in the consortia, Inadequacy in documentation, Omissions/obligations liabilities set forth in the concession agreement and contracts, Change in standards and specifications, Non transparent toll adjustment procedures Substitution risk, Indemnification and hold harmless clauses, Low enforceability of the arbitration decision, Unexpected call of on-demand guarantees, Difficulties in Disposal of imported equipment, Transfer risk, Changes in the provision of concession agreement (due to court order/decreed), Termination/penalty due to default of obligations set forth in concession, Non repayment of revenue shortfall loan, Failure to pay performance guarantee, Delay in achieving financial closure, Persistence of force majeure situation for long time & Failure to meet quality requirement.

b)Political risk (Direct and Indirect)

It involves the following:-

Change in Government policies/law equipment, Expropriation, Reduced support from future, Governments Non cooperation from Government (due to fear of loss of control), Changes in currency inconvertibility/non transferability, Nationalization, Politically motivated labor resistance, Backtracking from concession agreement, Sanction for competing facility by Government under political pressure & Indirect political force majeure events (war, strike/ blockade/public agitation etc.).

c)Partnering risk (Joint Venture risk)

It involves the following

Disagreement among consortium members on profit loss sharing, Disagreement among consortium members regarding allocation of works, Policy changes in parent company of consortium members, Disagreement on contract provisions, Technology transfer disputes & Over interference of parent company in joint venture policy.

d)Regulatory risk

It involves the following:-

Government order for closure of lanes, speed limits, diversions, Reduction in the toll rate by Government, Changes in law/legislation/trade regime (project specific and industry specific) & Delay in toll notification.

e)Financial risk

It involves the following:-

Fluctuation in foreign exchange, Increase in interest rate, Non availability of finance from lending institutions in time, Faulty financial structuring of project, Working capital shortage, Change in cost of indemnities and insurance, Inflation, Currency Instability, Commercial viability of the project, Supply risk (poor market performance), Residual

value risk/liquidity risk, Non availability of finance from equity participants in time, Poor response from capital market, Lack of liaison between lenders.

f)Environmental Risk

It involves the following:-

Protest of environmental activists, Environmental impact liability (air, and ecology), Changes in environmental consent, Impending environmental changes, Existing environmental constraints noise, Public interest litigation by environmental activists.

g)Physical Risk

It involves the following:-

Damage to road structures due to overloading/design defects/accidents, Labor injuries, Damages due to non-political force majeure (fire/earthquake/flood etc.)

IX. METHODOLOGY OF STUDY

Procedure :

This research study employed a combination of methods for an integrated qualitative and quantitative research methodology . The first stage was a comprehensive literature review together with lessons learned from the practice of BOT projects in developing countries, especially in India, to develop a initial list of risks associated with India's BOT infrastructure projects. In the second stage of instrument development, only the critical risks associated with India's BOT Infrastructure projects were chosen for study.

X.ANALYSIS OF SURVEY RESULT

To analyses the survey results, the Microsoft Excel tool was used. The rating given by the respondents were added together. These ratings were then divided by the total of the rating. The result so obtained when multiplied by 100 gives the percentage of risk. This risk so ascertained would then decide the ranking of the risk. Various remarks were obtained on the questionnaire format.

1. Concept and feasibility stage
2. Fundraising & financial closure stage
3. Tendering, bidding & award of the contract
4. Project Planning & procurement
5. Contract Execution, Monitoring & control
6. Project closure, settlement & claims
7. Project operations and maintenance

XI.RESULT OF SURVEY

From the survey analysis the most critical survey were analyzed as follows:

1. Fund Raising & financial Closure stage
2. Contract Execution, Monitoring & control
3. Concept & feasibility Stage
4. Project , Operation & Maintenance
5. Tendering, Bidding & Award of Contract
6. Project Planning & Procurement
7. Project Closure, Settlement & Claim

The major risks identified at each stage were:-

1. Fund Raising & financial Closure stage

Delay in financial Closure, High interest rates for debt component, Delay in payment by client & Bankruptcy of Client, Contractor.

2. Contract Execution, Monitoring & control

Changes in scope & work or specification, Accidents due to wrong method of working or technology effects, Suspension of work by client & Construction equipment breakdown.

3. Concept & feasibility Stage

Unrealistic demand forecast for the future growth, Environmental Impact of Project, due to location & Rehabilitation of affected People.

4. Project , Operation & Maintenance

End users or consumer Perception & Toll theft.

5. Tendering, Bidding & Award of Contract

Encroachment problem, Change in statute or Taxation, Impact of import export Regulations, Political Instability & changes in policies.

6. Project Planning & Procurement

Land acquisition, Delay in drawings & approvals.

7. Project Closure ,Claims, Settlement & Defect Liability

Faulty Design Performance & Business Interruption.

XII.CONCLUSION & RECOMMENDATION CONCLUSION

BOT Projects in the highway sector are guarded by multiple risks which result in time overrun & Cost overrun on the part of the concessionaire. It is learned that there are at time political intervention and also the unstable government, difficult laws in acquisitions of land in Maharashtra is creating the problem. Also through the comment, it is learned that there are major hurdles in land acquisition for the government bodies. Following are the conclusions drawn from

- For the project sponsors to structure a winning proposal based on the BOT approach a number of prerequisites are required; strong government support, stable currency, stable economic system, and the project must be technically feasible and financially viable.
- Considerable co-operation between the government & the private institution is essential. For each of the project participants to take the risk, they are better suitable commercially and politically.
- Due to the complexity of introducing and implementing BOT policies, an institutional framework should be set up to plan, analyze, implement and the process of the BOT scheme.
- Responsibility for construction cost and time overruns should lie with the contractor.
- The project sponsors must evaluate and allocate the financial, political and technical risks to the various parties involved and each participant must have required contractual securities as well as incentives to be decided to the project.
- The participation is fraught with risks due to lack of experience or recent experience of the parties regarding these systems, as well as the complexity of the relationships among the parties.
- The systematic allocation of risks should be done among the different parties. This should be done properly and with extra care.
- Before awarding BOT project to any contractor, detail study about his history, his capacity of projects of the same scheme, his assets, any court cases pending against his name, his bank statements, problems involved in his ongoing projects should be done.
- Participation of private parties saves the funds of government which government can use for social aspects and for development of the country.

RECOMMENDATION

On analysis, it is recommended to have:

- Independent Regulatory Monitoring authority for the Highway sector
- Traffic projection have tampered in order to make the project bankable and hence Clear and realistic traffic Projections from the Traffic expert should be made to earn revenue, to frame the contract and other necessary things
- In the case of land acquisition, Proper Compensation should be made through a competent body to acquire land. Legal Complications in this manner to relieved to a practical level
- Separate Cell for land acquisition/encroachment problems should be addressed and also be vested with the necessary power to make them come in immediate effect should be sought after.
- The government financial institutions should provide loan for the necessary project at lower rate of interest and concept of the negative or positive grant should be well utilized.
- Equipment Management/ Maintenance should be proper and onsite proper and certified mechanic should be part of the team. Heavy equipment should always be well equipped with the trained helper to avoid any accidents on site.
- End user perception should be changed by giving better facilities to them.
- A Government should be well informed about the requirement of the project and the essential hurdles for the project beforehand in order to have timely completion

Thus the project should be completed within the timeframe and without cost overrun promoting high of highway infrastructure boosting the other sectors & the Indian economy at large.

REFERENCES

- [1] Sharmila Mane, Dr. S.S. Pimpalikar, "Risk assessment of BOT Projects". S.M thesis in Civil Engineering Department, Maharashtra institute of Technology, Pune at IJCER International Journal of Computational Engineering Research Volume 03 Issue, 8
- [2] Grey. S (1995), PRAM: Practical Risk Assessment for Project Management, John Wiley and sons Limited Chichester.
- [3] We Liang "Risk Management for BOT infrastructure Projects in China", School of Economics, Wuhan University of Technology, Wuhan, China
- [4] Biju Mathew,K.P. Ramaswamy " Risk Assessment and Management in BOT Infrastructure Projects in Kerala ,Thangal Kunju Musaliar College of Engineering, Kollam.
- [5] Kleimeier, S., Megginson, W. L., 1998. A comparison of project finance in Asia and the West. In: Lang, L. H. P. (Ed.), Project Finance in Asia. Advances in Finance, Investment and Banking. Volume 6. Elsevier - North Holland, Amsterdam, pp. 57-90.
- [6] Syed Kamarul Bakri Syed Ahmad Bokhary, Kalaikumar Valluyutham,Narayanan Sambu Potty and

Nabilah Abu Bakar, Risk & Mitigation Measures in BOT Projects, Mujadaya Cooperation, Malaysia.

- [7] Dr. Prof. Indrasen singh, Risk Management in BOT Road Projects, NICMAR Goa, 2010
- [8] Wang, S. Q., Dulaimi, M. F. and Aguria, M. Y. (2002). Research Report, BEWCMRICP: Building the External Wing of Construction: Managing Risk in International Construction Project, National University of Singapore.
- [9] Bond, Gary, and Laurence Carter, "Financing Private Infrastructure Projects: Emerging Trends from IFC's Experience," IFC Discussion Paper No. 23 (Washington: The World Bank, 1994).
- [10] Schaufelberger, J. "Risk Management on Build-Operate-Transfer Projects" at CRC2005 Construction Research Congress 2005: pp. 1-10.doi: 10.1061 / 40754 (183) 91
- [11] International Finance Corporation, Financing Private Infrastructure, Lessons of Experience No. 4 (Washington: The World Bank, 1996).
- [12] Hiren Maniar, Risk Analysis of Infrastructure Projects: A Case Study on Build-Operate-Transfer Projects in India, The IUP Journal of Financial Risk Management, Vol. VII, No. 4, pp. 34-54, December 2010
- [13] Grey, S. (1995), Practical Risk Assessment for Project Management, John Wiley & Sons Ltd, Chichester.
- [14] Risk Management in PPP Projects – IL&FS Report (Construction Risk Management Conference India, August 2010)
- [15] Qiao, L., Wang, S. Q., Tiong, L. K. R. and Chan, T. S. (2001). Framework for Critical Success Factors of BOT Projects in China, The Journal of Structured and Project Finance, 7(1): 53-61.
- [16] Wang,G.Q,Jia,X.L (2005). Risk Management on the BOT Investment and Financing Mode, India Water & Wastewater, 21(9): 85-88