Strategic Risk Management with the Approach Huge in BOT Projects

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ABSTRACT

Using build - operate - transfer (BOT), by governments, in line with the move to privatize large state projects is increasing. This performance is more important in developing countries. Establish a framework for identifying and analyzing project risks is basis of the BOT project. Only risk identification, allocation and make proper preparations for the management of the project's success can be hoped. In this paper, with using method library, the main risks that investors and lenders are facing in their BOT projects, are identified and managed.

Key words: Risk Management, BOT Project, Risk Identification, Host Government.

Introduction

BOT method, which stands for three words to build, operate and transfer, is a method of financing the projects. This method of financing investment projects, fundamental studies of the project and the baseline start and the feasibility and preliminary design, detailed design and provides executive to run and after preparing and producing goods and components, construction and installation operations carried out and project launches and finally a period of 10 to 15 years of project operation and at the end of the project is transferred to the host [5].

With regard to the development and execution of large projects is Process problems and uncertainty, decisions based on those uncertainties that venture to say, will determine the fate of each project. Method is essentially an application of BOT, identify and provide a mechanism for managing this risk allocation is structural analysis and focal point of why the BOT considered [15].

Risks in construction projects due to the high capital requirements and too much time to such projects increase on the other hand due to the long duration of the contract period, anticipated many of the factors affecting project financing is very difficult and uncertain. Hence, identifying and managing risk will be playing a key role in the construction and financing of BOT projects [10].

In this paper, by taking advantage of articles and studies have been conducted to identify project risks in BOT, has been tried to present the basic principles of strategic risk allocation and risk management BOT projects.

Large projects through BOT:

In the past, the development of a national strategic plan has been monopolized by the public sector. But population growth and demand, and the budgetary constraints and public administration facilities provided in business for the private sector. BOT, the government retains strategic control over the country's infrastructure, return equipment at the end points and the public interest in the project; method has become a popular and effective. This is a great way projects are planned or are under way around the world [3].

In the BOT system, private sector to design, build and operation of the project and is responsible for project financing. And he points to the state for a certain period of operation of the project until the project was picked up by the private sector (such as toll roads, power plants and sell electricity), capital and repay loans taken to possible to take advantage and points expire after a period of time, facilities granted to the host country [12].

1 - The definition of risk:

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Most business decisions are taken on the basis of conjecture known about the future. Decisions based on assumptions, estimates, forecasts of future events, along with the risk. Risk is an abstract concept that is difficult to define and in many cases it is impossible to measure [2].

The risks of potential financial gains or losses, physical damage and losses or delays arise as a result of a specific action [13].

One of the most difficult stages of project management, evaluating are the impact of various risks on the project; the most important impact of the risks on the project can be put as follows [8]:

1-1 - Failure to projects with an estimated of cost
1-2 - Failure to complete the project in completion date
1-3 - the inability to achieve the desired quality and utilization trends

2 - Strategic risk management of BOT projects:

The successful implementation of BOT is not easy. The whole process of project development is complex, time consuming and costly business. Financial risk is high, hard competition, lengthy negotiations and the opportunity cost is significant. This causes the project to be it provides a structure to manage project risks and thus increase the chances of the project in achieving its goals. Therefore, control and risk management, It is essential to the success of a BOT project; because risk management has been the center of each BOT project [12].

Project management and strategic risks, will make [3]:
2-1 - ensure the safety and success of the project, reduce risks and prepare to deal with them
2-2 - Reduce costs by identifying hazards and controlling tool for predicting the risk of losses
2-3 - conduct negotiations in a shorter time and more successful in identifying areas of risk and the guarantees necessary for their control
2-4 - identifies the responsibilities of each party to control risks and thus determine their expected profit
2-5 - Forecasts and tools necessary to reduce risks to an invitation to participate in the project

Distribution Risks of BOT projects in various stages:

Two main stages can be distinguished in the implementation of infrastructure projects:
Construction phase with relatively high risks and operation stage with relatively low risks.

Figure 1 shows that the start of construction of the project will increase the volume of risks, because financial resources to provide materials for the project, payment of wages and purchase equipment which costs and interest received on loans and deposits are gradually and finally, at the end of the period and early operation, project risks are the highest. And this is when the project was under intense pressure and maximum rate of loans is its greatest advantage. Upon completion of the project and the beginning of the operation, profits and revenues and debt service project begins and profitability of their investment projects and investors are gradually getting and ensure the success of the project is to increase and risks to be reduced [4].

![Fig. 1: Risk distribution curves at different stages of BOT projects.](image)

- Strategic management process of risks in BOT projects:

The risk management standard of ISO 10006 is following steps [1]:
- Risk Identification
- Risk Assessment
- Risk Treatment
- Risk Control

In contrast, the standard PMBOK process more fully described in the following six steps [11]:
We know, the standards for risk management plans have been developed in a particular organization and risks sharing between the various elements of the project are discussed. While a BOT project and the ability of the different factors involved, the risk management process should be planned the role of each of these factors to determine the risk management process. Adequate control of risk, risk management is dependent on the ability of the agent. Just when we were sure that the risks are properly controlled risk factors had sufficient knowledge of the risks and tools necessary to anticipate and prepare to mitigate its occurrence. The risk management process should be modified as follows order to be consistent with BOT projects [3].

**Fig. 2: PMBOK risk management process.**

**Fig. 3: Improved risk management process in accordance with the BOT.**

### Identify strategic risk of BOT project:

A project to identify risks in BOT, it is necessary that all elements of the project, the project must have access to adequate and reliable information. This information must necessarily be in the best position to absorb risk factor that is to be published. All these risks should be carefully evaluated based on the following four factors are identified [6]

1. A source of risk, including the possible errors and objectives of each project, and unforeseen events
2. Character temporary / permanent of risk
3. Reduce the impact of possible risk factors, such as insurance coverage
4. Implications for the risk of the consequences of such termination or indemnification agreement and compensation for damage

Risks of construction projects through BOT, is presented in Figure 4.
Qualitative risk assessment is based on the PMBOK standard using the following techniques: 1- The probability of occurrence and impact, 2-Matrix probability and impact rating, 3-The test project assumptions, 4-Estimated accuracy rating. In addition to the procedures provided in the standard another major project is the application of quantitative methods in the opinion of many experts. This method is expected to be comparable to the evaluation criteria, experts from and the views of decision makers (Both political and economic stakeholders and decision-makers), with regard to political influence - economic importance of these projects, collected in the form of a risk matrix is converging. As a result of this comprehensive risk assessment rating of the project for faster response and higher-priority risks are identified. Risk ranking and analysis requirements have been defined, the next and scope of work is determined [3].

3 - The programmed reaction risks in BOT projects:

Processes respond to risks (Treatment), the selection process and determine actions to enhance opportunities and reduce threats to the achievement of project objectives. In the process of identifying risks and assessing their impact, actions or practices for the control of major risks to be identified [3].

Here is a short overview of standard reactive strategies to risks, have tried multiple risk control tools including warranties, conventional contractual obligations or recommended risk mitigation strategies in BOT Projects, be referred to make it possible to create Ability to understand and work with these tools, it would be a good choice. To respond a variety of risks can utilize a variety of strategies; most of these strategies, as listed below, have been described [3]:

3-1 - Avoidance:

Avoid the risk mean preventing potentially risky events, through the actual project schedule risk and conditions of its occurrence and thus eliminating the potential negative consequences of the project objectives will be secure. Various techniques are used in this strategy. Such as scope changes and cost increases, even if the fraction of high-risk activities
and... The risk of infrastructure due to lack of infrastructure for the development of a regional plan is changes to the project scope projects, it will also include the construction of infrastructure, makes it possible to avoid risks. Or, in cases where the contractor faced with currency risk there is enough uncertainty for foreign purchases of foreign exchange, or to convert the currency of the host country or no permission to leave the currency of the host country, there is selecting a strategy to remove high-risk activities, some padding of the projects in terms of foreign exchange earnings. In this case, primarily the risks of currency conversion or withdrawal are avoided [3].

3-2 - Transference:

Transfer, transfer of property, responding to the risks to a third party. The occurrence of potentially hazardous events is inevitable. The financial implications of the project according to the project and event management, these risks can be transferred to a third party. Often force majeure risks can be transferred through insurance, even some political risk can also be transferred to an independent insurance company; MIGA insurance is provided by the World Bank, one such tool. The conventional instruments are used for risk transfer strategies. Like when we have a project with the exclusive purchase the product, the sole risk of buying a product on the market; agreements Take-or-Pay, are tool for transferring risk to public companies [3].

3-3 - Mitigation:

In order to reduce the possibility of carrying out preventive measures to reduce the degree of risk or a fraction of the expected outcomes is boundless. It measures the financial impact of cost reduction compared with the risk of occurrence, are selected. Various techniques for reducing the risk of future contracts, in cases where due to economic instability in the host country, the project is facing severe inflationary fluctuations contractor's risk and cost with the purchase of raw materials, must be reduced by the choice of strategy, contracts with the call option, long-term supply and raw materials to ensure stability. This strategy also in cases where projects market risks arising from changes in product demand faced or not sure of price stability and aims to ensure that its revenue in the long term, the choice of reduction strategy, put option contracts can be signed take him long to ensure that the products [3].

3-4 - Acceptance:

Due to possible changes in project selection strategy, compliance, the likelihood and impact of risks are acceptable. Admission to both passive and active strategies is performed. Enable compliance with contingency plans for dealing with anticipated events, while accepting the passive strategy, the preparation and adoption of plans to withdraw the funds, time and the quality is less than acceptable results. One of the most important tools in response to the risks generally successful BOT projects can be seen, specific row in the contract as modified prediction mechanism is the effects. While the project faced serious risks to inflation (inflation-induced changes at the national level) or macroeconomic factors such as the risk of recession and demand reduction projects administration and compliance Strategies project selection and consider a contingency plan, agree on mechanisms to correct complications. In this case, the change in inflation rate or reducing demand, according to the agreed mechanism, project timeline increased morbidity raises or throws it forward [3].

Allocation process risk BOT project:

The risk management structure, after ability to identify and assess the risks of the project, risk should be shared between project factors. The allocation of risk should be detailed and complex process performed project order to satisfy all parties will ensure proper control of all risks, for this reason, very few studies have been conducted in this area. The framework provided by UNIDO [14] and EIC [7].

Institute for International Contractors in Europe as well as in the book Negotiation Platform risk to both the construction period risks and duration of exploitation is divided. It's a good way to structure the project risks, appropriate measures to mitigate risks allocation and individual risk factors. As an important part of the matrix, there must be consequences for each risk factor, those who have accepted the risk and those who have not accepted, to be determined. This matrix can be indemnity costs if you loan money to a subsidiary or division, mortgage lenders are lower than that, to be classified, and in some cases, termination of contracts or agreements expansion project. The following table shows the EIC framework provided by the matrix [7].
Table 1: Risk allocation matrix EIC.

<table>
<thead>
<tr>
<th>Risk</th>
<th>Reason</th>
<th>Remedy</th>
<th>Consequences for Lenders</th>
<th>Consequences for Investment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Within / outside Consortium</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td></td>
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<td></td>
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<tr>
<td>Forced Mixture</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sub-contractor</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sub-contractor</td>
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<tr>
<td>Project</td>
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<td>Project</td>
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<tr>
<td>Co.</td>
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<tr>
<td>Co.</td>
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<tr>
<td>Government</td>
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<tr>
<td>Government</td>
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</tr>
<tr>
<td>Economic</td>
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<td></td>
</tr>
<tr>
<td>Investment</td>
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<tr>
<td>Financial</td>
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<tr>
<td>institutions (banks)</td>
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<td></td>
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<tr>
<td>Insurance</td>
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<tr>
<td>institutions</td>
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<td></td>
</tr>
<tr>
<td>such as MdIAA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Political</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Person responsible for the management</td>
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</tbody>
</table>

Embed the above principles and the ability of each project, experts on how to share the risk questionnaire method of data collection and in the third stage, gathered below. Table 2 shows that the method proposed guidelines for risk sharing the view shows the experts and employers [15].

Table 2: The results of the questionnaire, how to allocate risks in BOT project.

<table>
<thead>
<tr>
<th>Force Mixture</th>
<th>Operation</th>
<th>Risk project</th>
<th>Financing</th>
<th>Market</th>
<th>Preparing</th>
<th>Client</th>
<th>Rules</th>
<th>Economic</th>
<th>Political</th>
<th>Type of risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>institutions</td>
<td></td>
<td></td>
<td>Financial institutions (banks)</td>
<td>Insurance institutions such as MdIAA</td>
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</tbody>
</table>

Control and follow the risk management process in BOT project:

Risk management is the process to ensure full implementation of risk management programs implementation and effectiveness of these programs, the project will reduce risk. In addition, the process of tracking identified risks, the remaining risk control and also identify new risks during the project life cycle is considered. The successful implementation of this process to create appropriate information to contribute to the effective functioning of in certain situations, the risk is likely to occur. At the end of each stage of the application process, responding to risks and records to be used in the same project risks data will be collected in a database [3].

Summary and Conclusion:

Risk management is based of BOT projects so that experience has shown, the long-term contract or failure in negotiations of BOT, due to differences and challenges the conventional how is the sharing of risk.

Identified risks, risk management are the first step that would be the basis for the other levels. In this article with a library of studies done in this field, collect the views of experts and employers, structure to identify risk classification was presented. This structure will be a useful tool the private sector and the best way to do so risk sharing between agents.

Governments and the private sector that are want to approach BOT projects; with such a structure, identify risks and develop for any given project, ability to achieve their demands during contract negotiations and will be also help to guide and process control in BOT projects.

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