A Discussion on Infrastructure Project Financing Risks

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Infrastructure project risks can be defined as uncertain events whose occurrence typically have negative impacts on the project delivery objectives which are assessed based on cost, time and performance. The implications of inadequate management of project risks such as cost overruns are sometimes foreseeable and avoidable (Beckers et al., 2013). To ensure the efficient procurement and delivery of infrastructure, project risk analysis and management is required regardless of the project's budget, timeline, country of origin and industry. The aim of this paper is to briefly discuss project risk analysis and highlight risks that are common to various types of infrastructure projects using a simplified approach.

Project risk analysis and management can be defined as the process designed to eliminate or reduce the effects of risks which have the potential to threaten the achievement of project objectives (Norris et al, 1992). This process can be divided into 2 main components: Risk Analysis and Risk Management (Figure 1). Risk analysis covers a range of activities including risk identification and quantification where possible while risk management involves proposing and taking specific response actions to the risks identified. The process of risk analysis and management can be very complicated especially for large infrastructure projects.

To determine risk management and mitigation actions, risks must first be identified. This is achieved through risk analysis which is also subdivided into 2 main components: Qualitative and Quantitative risk analysis. Typically, qualitative risk analysis is carried out first by identifying and categorizing potential risks that the project may face. Through

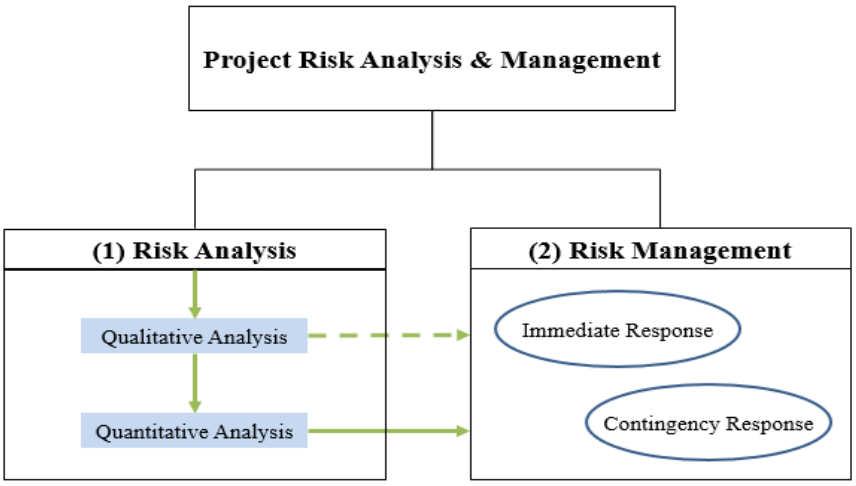

Figure 1. Project risk analysis & management simplified

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brainstorming sessions, interviews and experience of stakeholders, risks are categorized based on probability of occurrence and impacts. Where possible, management actions are prescribed to eliminate or reduce the effect of risks identified. Risk management actions include risk transfer to insurance companies, risk allocation to capable parties, and setting aside contingency amounts and flexibility in schedules to accommodate any eventualities. In cases where contingency amounts will be set up, it is important to carry out quantitative risk analysis to ensure the right amount of cover is specified to protect various parties. Monte Carlo simulations, Bayesian belief networks and several other probabilistic techniques are used to assess the potential impacts of risks on projects (Lee et al., 2009, Lisse, 2016, Wylie et al., 2014).

The level and type of risks associated with infrastructure projects differ based on the region, sector, local government policies, types of agreements and several other factors. The capital-intensive nature of infrastructure assets means that risk assessment must be prioritized during project development to avoid causing unnecessary financial stress to project participants over time. Heterogeneity across the infrastructure asset class implies that there is also a significant amount of variation in risks associated with individual projects.

A simplified approach to identifying project risks is to broadly categorize risks based on project phases. The risk categories identified are pre-completion risks, post-completion risks and ubiquitous risks (Figure 2). There have been several approaches to classify infrastructure risks (Cracuin, 2011). Some studies have classified risks based on 3 main categories namely: political & regulatory risks, macroeconomic risks and technical risks (OECD (1), 2015, OECD (2), 2015). In a different publication, risks were classified based on two project phases namely construction and operation phases from the lender's perspective (Gardner and Wright, 2016). A more detailed approach to risk identification is based on identifying risks faced by the various parties involved in the project with respect to the stages.

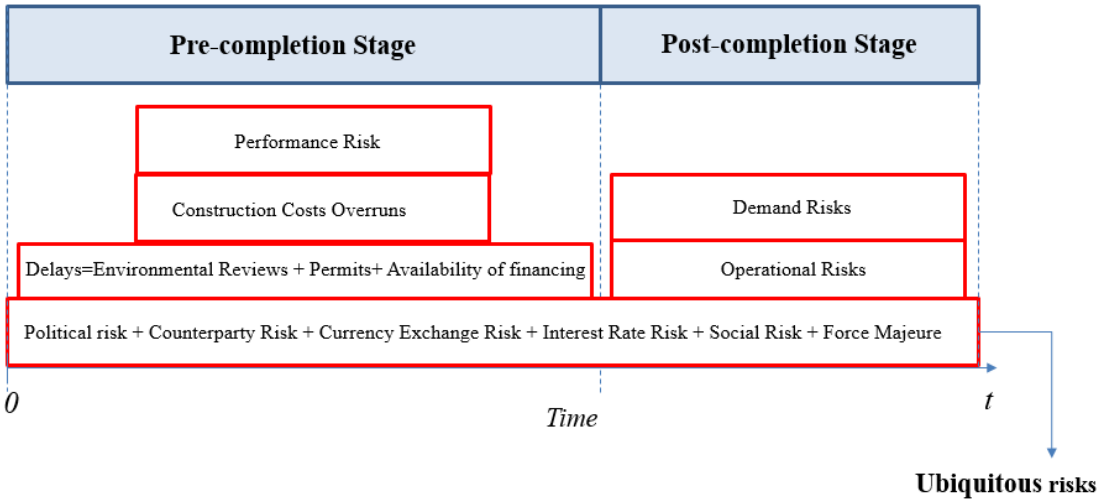

Figure 2. Simplified View of Infrastructure Development Risks

Under pre-completion risks, one can consider construction costs, performance risks and delays as the common types of risks that must be managed in order to ensure profitability. Lenders typically have various strategies and provisions in the contractual agreements to deal

with construction cost increases which are significantly more than what is anticipated at financial close. Delays in completion will also lead to cost increases. A few of the pre-completion risks are briefly discussed below:

Delays: Delays to completion can be the result of several factors such as the experience of contractors, delays in issuance of permits, inefficiency of connecting infrastructure which can affect supply of materials, political issues and public opposition. Delay risks vary based on the stage of the project and the length of the projected construction period (Fitch Ratings, 2009). To manage this risk, there can be incentives and penalties in the contract agreements to ensure construction proceeds according to schedule.

Construction Cost Overruns: The risk of actual construction costs exceeding the projected costs must also be assessed and managed adequately. Cost overruns, together with delays stem from technical challenges, over-optimism as well as strategic misrepresentations (Siemiatycki, 2015). Selection of contractors with a proven track record as well as specific contract provisions can mitigate this risk to a larger extent.

Performance risks: Performance risks are present in cases where project completion is subject to performance tests. As such, the contractor must demonstrate performance that meets pre-defined standards before being released from delay liquidated damages liability (World Bank Group, 2016 (1)). However, performance tolerances may also be stipulated in the contracts to ensure requirements are in line with what can be achieved by developers.

The main types of risks a project may face in the post-completion phase include operational risk and demand risk. Operational risks can be in the form of operational cost escalations and performance standards. Again, lenders and other investors are to identify various incentives and penalties that will ensure operation at required performance standards. Brief descriptions of these are below:

Demand Risk: This simply refers to the risk that the asset does not generate enough revenue to pay for its design, construction and maintenance (Aon Infrastructure Solutions, 2014). Revenues from fees and tolls are used to service debt and generate profits for investors. In public-private partnerships, demand risk is transferred to either the developers or the public agency in one way or another. In an availability payment model, this risk is transferred to the public sector which pays the operators a predetermined amount (availability payment) regardless of how much the infrastructure asset is used. In a demand-risk model on the other hand, the private operator is given the right to collect tolls and fees as a way to generate revenue. As such, their returns are directly related to the level of demand for the infrastructure asset. Managing demand risk is essential since user demand when significantly lower than projected levels can have an adverse effect on the financial sustainability of projects.

Operational Risk: Operational risks refer to those factors which are not considered as force majeure but can impact the operational requirements of the project (Schwartz et al., 2014). These may include technology failure, irregularity in the operating expenditure and environmental incidents. Management of operational risk can be achieved with provisions in the operations contracts.

Ubiquitous risks are defined as those which are present during pre-completion and post-completion phase of projects. A few examples of ubiquitous risks include currency exchange risk, interest rate risk, social risk and force majeure. These are further explained as follows:

Political Risk: These refer to risks that a project faces as a result of changes in regulations and policies. Researchers have grouped political risk into asset-specific and industry-specific political risks. Expropriation and concession renewal risk are two examples of asset-specific risks. On the other hand, change in industry regulations and taxation laws fall under risks that affect entire

industries or sectors (World Economic Forum, 2015).

Social Risk: The rationale behind public infrastructure projects is to boost economic activity and improve living standards. However, infrastructure projects can also have unintended negative impacts on the general public. When there is a notion that a particular project may not benefit the public, interest groups can engage in activities such as protests and demonstrations which can lead to delays in project development and even project cancelation (Lagorio, 2013). It has become increasingly important to assess social risks that projects may be potentially exposed to.

Interest Rate Risk: An increase in real interest rates will lead to increased cost of financing which will in turn have an effect on profitability of the project (OECD (2), 2015). In the absence of significant changes to revenue, higher debt service will imply a lower amount of free cash flow from the project. When lenders are unable to provide debt financing at a fixed rate, hedging can be used to manage interest rate risks.

Currency Exchange Rate Risk: Currency exchange risk is important when there is a chance of divergence between the currency of project revenues and debt financing which can lead to sharp increases in cost of debt (The World Bank Group, 2016 (1)). Hard currency loans create currency risk if revenues are in the local currency meaning there will be an asset-liability currency mismatch. This can also have a significant effect on the financial sustainability of a project. Since project developers and governments may have limited to no control over exchange rates, allocation of this risk becomes a very sensitive issue during contract negotiations (Verdouw et al., 2015). Recommendations for managing currency exchange rate risk include hedging, limiting reliance on foreign currency debt and macroeconomic policies from the government that can reduce the rate of depreciation of the local currency (Gray and Irwin, 2003).

Force Majeure: This generally refers to risks beyond the control of the affected party with the potential to have an adverse material effect on the party's ability to perform its contractual obligations. It must be noted that force majeure only includes those risks which are not products of negligence on the part of the affected party (The World Bank Group, 2016 (2)). They can be grouped into: natural events and special/political events. Natural events can include floods, earthquakes and other natural disasters. Due to the impacts natural events can have on projects, the likelihood of occurrence and potential impacts must be evaluated extensively. Also, insurance can be purchased for protection in the event that a natural disaster occurs. Special events refer to wars, terrorism or changes in regulations. In order to limit the effect of special events on profitability of projects, political risk insurance can be sought from export credit agencies and multilateral organizations such as The World Bank. During contract negotiations, special attention must be given to the definition of events which can be classified as force majeure and the operative clauses which state the effects of such events on parties' contractual obligations and rights (PwC, 2016).

In summary, projects face different types of risks at various phases during the project lifecycle. Risk management is a key aspect of project development and implementation that is required to ensure sustainability and profitability. Most of the risks can be addressed with incentive packages, penalties and guarantees in contract agreements. However, the public sector must be able to balance provision of guarantees to attract investors without creating large liabilities for taxpayers. Finally, to improve current risk management procedures, there must be increased emphasis on data collection and analysis to provide insight in the construction industry.

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