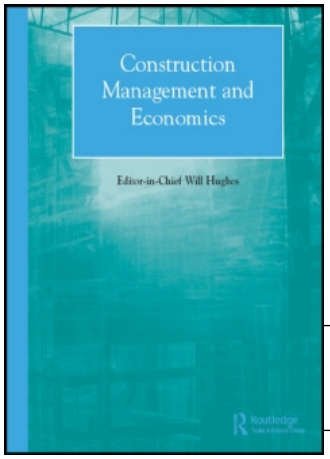

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The financial risks in build-operate-transfer projects

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The financial risks in build-operate-transfer projects

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The build–operate–transfer (BOT) approach for developing infrastructure projects is a technique that allows fast realization of public works in cases of a shortage of public funds. This process is full of risks, due mainly to the complexity and extend of the disciplines, public agencies and stakeholders involved. The identification, classification and presentation of a comprehensive list of this type of risks will provide BOT project practitioners with a useful tool in the effort of setting up successfully a BOT concession agreement. The approach presented provides a practical insight into 27 financial risks, which are associated with the BOT projects in their lifecycle. This is achieved through proper justification and description of the content of each risk. Furthermore, a categorization of the risks is presented, according to the stage at which they occur and the sources of their origin. The findings of this research would facilitate the risk analysis process that is being conducted by risk managers prior to bidding for a BOT project and during the negotiation period.

Keywords: BOT projects, finance, project management, risk

Introduction

The build-operate-transfer (BOT) approach to develop infrastructure projects and facilities of public interest such as bridges, airports, power plants, detention facilities, parking places, etc. is an alternative for a country that lacks the appropriate funds to undertake on its own projects of this scale. In the BOT approach, a concessionaire retains a concession for a fixed period, usually of 30–40 years, for the development and operation of an infrastructure facility. At the end of the concession period, the concessionaire transfers the ownership of the facility free of liens and at no cost to the public party (government, ministry, public agency) that has originally asked for the development of the project. Through this process the several stakeholders that constitute the concessionaire aim to earn profits with a usual rate of return on investment (ROI) of 15–20% for equity and 8–10% for debt (Menheere and Pollalis, 1996).

However, these profits are usually expected only after the project initiates operation, while in the meantime the concessionaire is responsible for full financing of the development process. Figure 1 presents the usual function of the financial plan for the concessionaire during the lifecycle of a BOT project. The several stakeholders of the project, but also the end users, contribute to the project's financial plan by injecting capital into the project (inflows), in different phases of the lifecycle (the shaded cells indicate the lifecycle phase when this inflow occurs for each stakeholder) and in several forms (e.g. guarantees, loans, funds, etc.). At the same time, there are outflows to the same stakeholders, in the same or different lifecycle phases and in the form of debt service, insurance premiums and compensations. This simultaneous flow of funds between several stakeholders clearly indicates the need of a proper plan of private financing. The concessionaire undertakes the responsibility to form a viable and profitable financing plan that ensures the amount of necessary funds to develop and operate the facility. Raising funds is achieved through own funds of the concessionaire and loans from large financial institutions, banks and bond-holders. The structuring of the financing scheme is a complex process where several agreements (stakeholders agreements, loan and insurance agreements) and contracts (insurance, operation, supply, off-take, etc.) are formed and signed with a twofold objective: to ensure the basic financial flows (Figure 2) which are necessary for the viability of the project and to ensure the profitability of the investment for every party involved. In this process the identification and allocation of the several risks that have an impact on

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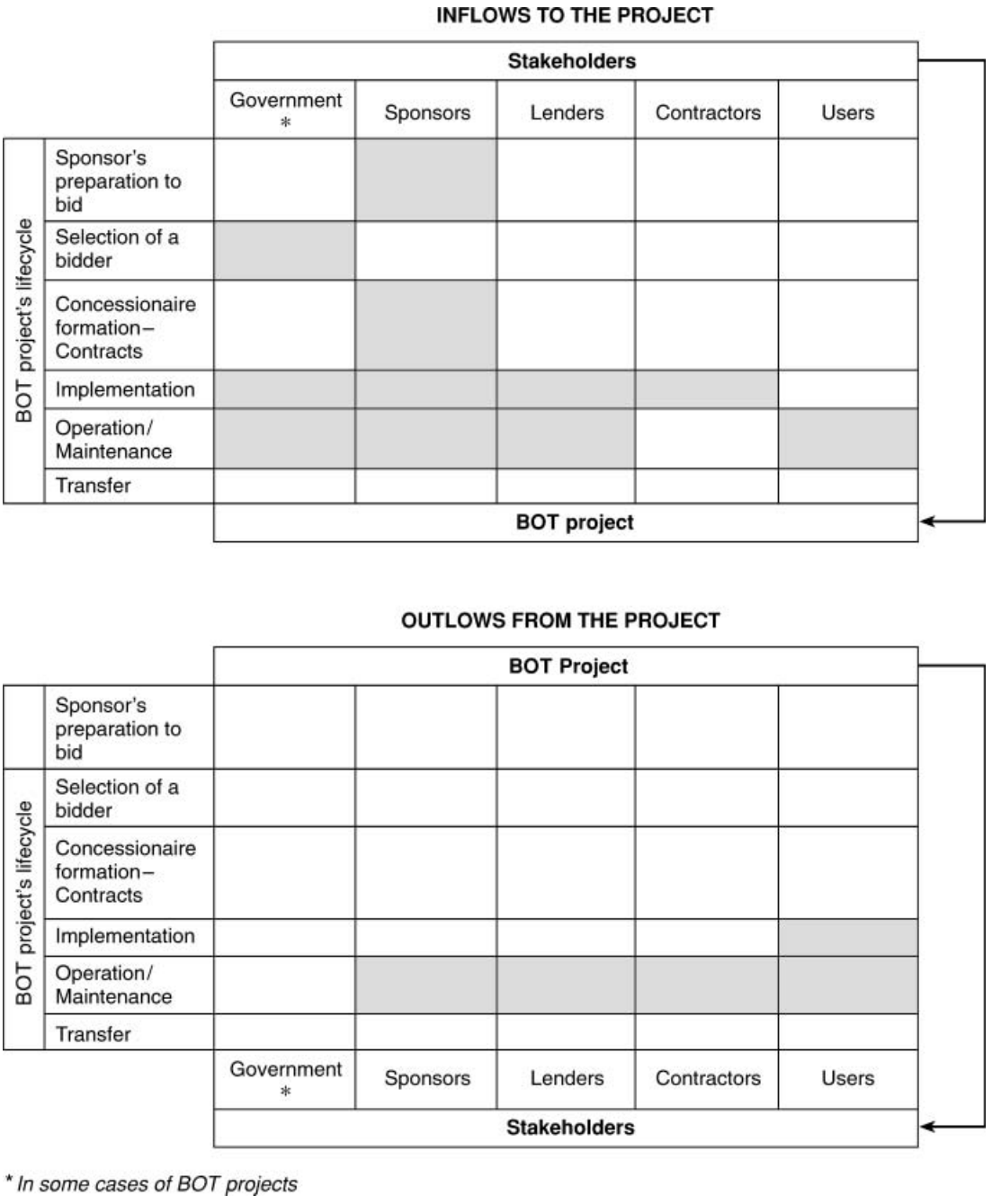

Figure 1 Inflows and outflows during the lifecycle of a BOT project

the financing of the project is of crucial importance (Wang *et al.*, 2004). This research focuses only on risks of an economic nature.

Financial risks

There are some variations concerning the term 'financial risks'. Schaufelberger and Wipadapisut (2003) include currency exchange rates, inflation and cost of capital (interest rates) in the financial risks context while they consider as a different class of risks (operational) the unanticipated overruns in construction or operation costs. Eales (1995) identifies two main types; specific and market risks. Finally, Tiong (1994) and Kumaraswamy and Zhang (2001) focus on limited 'equity-raising' instruments in developing countries (lack of stock markets or bonds) that, consequently, shift to financing through loans and therefore, reduce profitability.

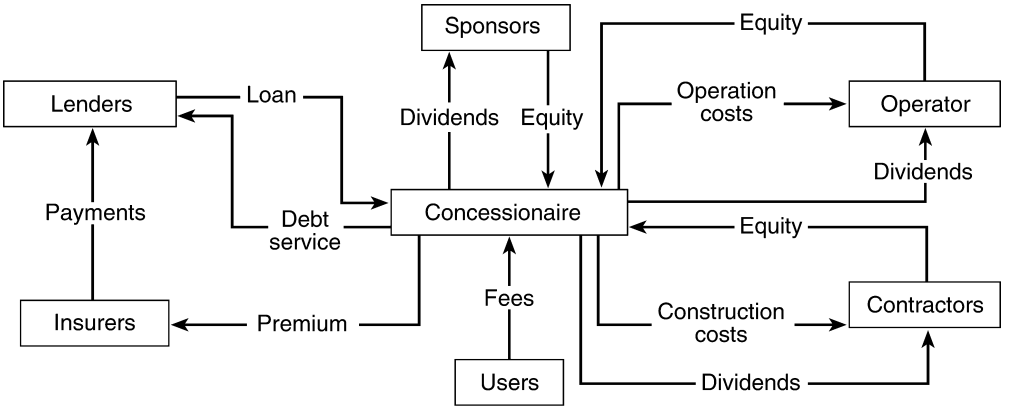

Figure 2 BOT financial flows (UNIDO, 1996)

In this research, financial risks are considered as the risks that have a negative impact on the cash flows of the financial plan in a way that endangers project's viability or limits profitability.

The diffusion of financial risks in the BOT lifecycle

The major feature of BOT projects is that the risks are assumed by the private sector which undertakes the development and operation of the facility for the concession period. However, the stakeholders in a concessionaire have a different perception of risks, mainly because of contradictory interests between them. For example, a contractor is concerned for a fast completion of the project's facilities; this effort may lead to deficiencies in the construction that decline the quality of the final product or service offered. On the other hand, the project operator's priority is best quality of the product/service offered, even if it takes a short delay in construction to achieve it. This inherent situation to the nature of BOT projects has so far prevented the development of one list of risks that could replace the several risk inventories used by each stakeholder in their risk analysis process for BOT projects. The adoption of the same risk inventory by all stakeholders involved will facilitate negotiations and preparation of proper risk mitigation strategies. In this paper, a comprehensive list of 27 financial risks along with their definitions is provided to establish a shared understanding between the involved parties in a 'green field' BOT project and, significantly, contribute to the success of the project. These risks have been identified through investigation in several project cases that were accessed by literature review (Tiong, 1994; Menheere and Pollalis, 1996; etc.). The identified risks were then reviewed and evaluated by four experts (three from Europe and one from Asia) with previous experience in BOT projects who replied to an extensive questionnaire developed in the context of this research. Some of these risks may also be identified in other methods of project development (e.g. high design and construction costs) and others are related solely to the BOT approach (e.g. prolonged negotiation period prior to project initiation).

The great number of relations in this project delivery scheme between several stakeholders in different phases of the project's lifecycle creates a situation of major complexity. In this context, a conventional approach may be inadequate to provide a clear representation of the risk issues and, therefore, result in inaccurate estimation of risks in the risk analysis process. To confront this problem, a proper classification of BOT financial risks should be used to assist risk analysts in their efforts. A review in the literature reveals many suggestions for classifying all risks that could be met in international construction projects (Thomas *et al.*, 1996; Bing and Tiong, 1999; Hastak and Shaked, 2000; etc.). In this research, the focus is on financial risks associated with BOT projects; in this context, two types of financial risk categorization are identified based on different criteria. The first type is according to the lifecycle phase where each risk occurs during the concession period. Table 1 clearly represents this type of categorization. The allocation of the risks to the lifecycle phases as presented in this table is based on an extensive review of data from specific cases of BOT projects (Eales, 1995; UNIDO, 1996; Kumaraswamy and Zhang, 2001; Schaufelberger and Wipadapisut, 2003; etc.) and responses by experts to a questionnaire developed in the context of the research.

The second type is according to the source of origin of each risk. Three major factors are considered as generators of financial risks in a BOT project: the state (government, involved public agencies, society) as client, the concessionaire (including all project

Table 1 Financial risks in BOT lifecycle

Code Name	Description	Lifecycle Phases of a BOT project: Sponsor's Preparation for the bid	Selection of a bidder	Concessionaire formation-Contracts Signing	Implementation	Operation/ Maintenance	Transfer
S1F	Prolonged negotiation period prior to project iniation		V	V			
S2F	Unfavourable economy in the host country	V		V		V	
S3F	Import/Export restrictions			V	V	V	
S4F	Rate of return restrictions	V	V	V		V	
C5F	Lack of creditworthiness	V	V	V			
C6F	Inability of debt service				V	V	V
C7F	Bankruptcy				V	V	V
C8F	Unfavourable economy of the country of the main stakeholders	V	V	V			
C9F	High bidding costs	V	V				
C10F	High design costs	V	V		V		
C11F	High construction costs				V		
C12F	Errors in forecasting the demand	V				V	
C13F	Wrong estimation of cost trade-offs between different phases in the project's life cycle	V		V		V	
C14F	Risk regarding pricing of the product	V	V	V		V	
C15F	Cost overruns	V			V	V	
C16F	Complex financial structure of BOT projects	V	V	V	V	V	
C17F	Lack of cooperation in case of new initiatives				V	V	
C18F	Insufficient performance during operation					V	
C19F	Lack of guarantees	V	V	V	V	V	
C20F	Financing risk	V	V	V	V	V	
M21F	Loan risk	V	V	V		V	
M22F	Fall of demand					V	
M23F	Competition risk	V		V		V	
M24F	Taxation risk	V		V	V	V	
M25F	Fluctuation of the inflation rate	V		V	V	V	
M26F	Currency risk		V	V		V	
M27F	Unfavourable international economy	V		V	V	V	

stakeholders from the private sector such as banks and suppliers) and the market as the economic framework wherein the project will operate. This type of categorization is represented with the first character of the code names assigned to each financial risk in the context of this research. Therefore, 'S' in the code name stands for 'state-rooted financial risk', 'C' for 'concessionaire-rooted financial risk' and 'M' for 'market-rooted financial risk'. The second character in the code name is the risk identifier number and the third character stands for 'financial' risk.

The presentation of BOT financial risks in Table 1 helps to draw interesting conclusions. In particular:

(a) Financial risks are met in all phases of a BOT project. This verifies the importance of a proper financing plan and an accurate risk analysis of financial risks to achieve a successful BOT project.
(b) There are risks that are repeated in more than one phase (e.g. lack of guarantees), while others are met only once (e.g. high construction costs). This issue deserves further consideration in an effort to properly assess the total risks of a BOT project.
(c) The operation/maintenance phase suffers the most from financial risks (21 of 27 appear in this phase) compared to the phases of preparation for the bid and concessionaire formation – contracts signing (18 of 27 and 17 of 27 appearances, respectively). This categorization clearly indicates the time when specific mitigation measures for financial risks should be regarded in the lifecycle of a BOT process.

The content of the financial risks

In this section the identified financial risks are presented in terms of their content. State-rooted financial risks are presented first, followed by concessionaire-rooted financial risks and finally by market-rooted financial risks. The code names assigned to each risk in Table 1 are shown in parenthesis.

State-rooted risks

Prolonged negotiation period prior to project initiation (S1F)

Long and expensive negotiations and processes before initiation of a BOT project may be a reason for a potential concessionaire to draw back from undertaking the project. The private sector (sponsors, lenders and construction companies included) will not be willing to invest time and significant amount of money (designs, bid documents, clarifications, negotiation expenses, etc.) to negotiate without solid evidence that they can reach a successful deal in a short period of time.

Uncertainty concerning the negotiation period and the result may inhibit the project from going forward.

Unfavourable economy in the host country (S2F)

The economic environment wherein a BOT project will be developed plays an important role for the project's progress. An unstable economy, without positive perspectives, with underdeveloped stock market and structural deficiencies can jeopardize the viability of the project. The government may be proved unable to ensure agreed guarantees, financing problems may arise and demand for use of the project may be far below than expected.

Import/export restrictions (S3F)

A deficit trade balance of the host country may be the reason for the imposition of several restrictions concerning imports or exports. In such situations it is a usual policy for the government to increase tariffs for imported products or control imports by issuing special permissions or restrict allowance of foreign exchange, etc. It may also restrict repatriation of profits. This kind of restrictions leads to increases of prices of goods and services and reduction of imported capitals in the host country (in the form of investments) and recession. Therefore, either directly or indirectly, existing foreign investments are seriously jeopardized in terms of success.

Rate of return restrictions (S4F)

A government, at some period in the operation phase, may impose restrictions on the rate of return of the BOT project's investment if the concessionaire's profits are considered to be excessive. The reason for retaining a fair rate of return for the concessionaire's investment is twofold. First, it is evident that when the commercial exploitation of the project is more profitable than anticipated, commercial risks borne by the host government (e.g. in the form of off-take quantities or guarantees for minimum income) should be reduced. Secondly, a windfall of profits from the concessionaire could 'create the perception that the concessionaire is taking advantage of the host country'.

However, such restrictions discourage the project's sponsors and reduce incentives to increase efforts for a most profitable investment. It is also possible that these restrictions would become permanent in the long concession period even if future conditions were different from the ones that triggered these restrictions in the past.

Concessionaire-rooted risks

Lack of creditworthiness (C5F)

Potential stakeholders of a concessionaire scheme should be creditworthy both to obtain loans without difficulties and to constitute a strong consortium that will have good chances to undertake the project. Lack of creditworthiness could result to smaller loans than required with strict clauses, or even no loans at all. The first case could jeopardize viability of the project while the second would prevent from winning the project in the first place.

Inability of debt service (C6F)

Concessionaire's debt service capability is connected strongly with the profit gained in the operation phase. A commercially unsuccessful project hinders the concessionaire from satisfying its financial commitments to lenders and shareholders. This leads to claims for liabilities and may endanger the project's viability.

Bankruptcy (C7F)

Bankruptcy (failure) may be considered in different ways and not all of them result to disbanding of the bankrupt company. The basic prerequisites for a company to be considered as bankrupt are to fail to: (a) serve current liabilities and (b) earn more than it spends (Weston and Brigham, 1986). A potential bankruptcy of any of the stakeholders of the concessionaire has a serious impact on the project's progress.

It should be pointed out that a potential bankruptcy is not necessarily connected to the BOT project but it could be related to other business activities of the stakeholders.

Unfavourable economy of the country of the main stakeholders (C8F)

The economic environment of the countries wherein the main stakeholders are located and operate most of their business may be important for the project's progress. An economy with deficiencies or lack of stability may adversely affect the status of the domestic companies and therefore impact their capabilities to successfully carry on with undertaken projects.

High bidding costs (C9F)

Bidding costs for a BOT project may be very high, especially if it is a large project. Visits to the host country by executives and related staff, gathering of information regarding clarifications for the bid, legal issues and host market's parameters, costs for advisers, development of feasibility studies and development of bid documents constitute, along with others, the parameters that define the bidding expenditures. Potential developers of a BOT project should avoid cost overruns at this very early stage of the process when the project is not even yet awarded.

High design costs (C10F)

At the bidding stage, designs are developed to propose technical solutions for the project in hand and prove capability and efficiency of the bidders to carry out the project successfully. A bidder is competitive if he proposes innovative solutions that facilitate the construction process, reduce cost, accelerate schedule and ensure the quality of the final product. The effort of the designers and overall cost of the designs should be properly taken into account to avoid redundant expenses at such a very early stage of the process.

High construction costs (C11F)

Construction costs include co-operation and co-ordination costs, costs of management of facilities and site, costs of imported industrial equipment, costs of imported or domestic raw material, costs of labour, costs of sub-contractors, costs of insurance and guarantees and general costs. Proper care for these costs during the development of the project's overall budget reduce the cost of the investment with positive consequences: (a) the potential of gaining profit at the construction phase is increased and (b) the formation of an attractive to lenders financing scheme is achieved. Moreover, minimized construction costs have a reduced impact on the overall costs in case of unexpected technical problems or even failures. The opposite, i.e. high construction costs, results in a non-competitive tender and loss of profit during the construction phase.

Errors in forecasting the demand (C12F)

A successful commercial exploitation of a BOT project is very significant, because it makes the whole project viable and hopefully profitable. Accurate forecasts of the future demand for the service provided or product produced by the BOT project assist the achievement viability and profitability.

An accurate forecast of the demand is based on proper use of reliable data through the appropriate forecasting method (questionnaire surveys, performance of experiments, correlation of economic parameters, experience) and the right inference process that produces trustworthy results that help the bidder to decide and submit a competitive tender. Any deficiencies in the above process mislead the potential developers and discourage them to bid for the project. An even worst scenario is for a bidder to submit a tender based on false data and thus jeopardize viability of the project, as future demand will be inconsistent with forecasts.

Wrong estimation of cost trade-offs between different phases in the project's life cycle (C13F)

In the long concession period of a BOT project (usually about 30 years) several trade-offs exist between costs in the different phases of the lifecycle. The proper consideration of these trade-offs should lead to a minimum overall cost. For example, maintenance costs can be reduced through a potential increase of the construction costs that will ensure improvement of the project's quality. On the other hand, if the cost related to the maintenance and transfer requirements is not introduced early in the project's planning, additional costs to upgrade the project's status may be required in the transfer phase depending on the contract provisions that the concessionaire is supposed to meet (concerning the project's functionality, sustainability, etc.). Wrong estimates of trade-offs between costs in the different phases of the lifecycle result in mismanagement and reduced profit.

Risk regarding pricing of the product (C14F)

The first step to achieving the proper pricing of a product is to make an accurate estimate of the demand/revenue ratio in the lifecycle of the project. This estimate determines the precision of the prediction of the product's future value. It also affects the development of the pricing strategy which will, always, be in line with the related provisions of the host country's regulatory system. This process is based either on data provided by the government or the concessionaire's knowledge about the host country's market. These data and knowledge are acquired through market research and analysis. An inadequate pricing policy may be the result of:

- False application of the estimation method of the demand/revenue ratio or false use of the data in hand.
- Wrong data for the estimation of the demand/revenue ratio.
- Non-anticipated changes in the long concession period (e.g. changes in the socio-economic conditions).
- Implementation of an inflexible fee-scheme.

The consequences of an unsuccessful pricing policy for the project are false expectations, regarding the project's commercial success, and insufficient revenue that endangers the project's success.

Cost overruns (C15F)

The cost overruns may be attributed to the concessionaire's responsibility and external and, therefore, non-manageable reasons. Inefficiency of the project management team may provide inaccurate estimates at the bidding phase for costs in the concession period. It may cause lack of cost control and unsuccessful management of project costs in order to increase profit. On the other hand, the economic conditions in the host country may lead to an increase of the production cost. Production cost is referred to the overall cost required by the concessionaire to deliver the product or service to the market. Cost of raw material, labour costs, overhead cost and cost of capital comprise the production cost. Every increase on these constituents directly increases the production cost and generally increases the price of the product/service and reduces the demand (Jahren and Ashe, 1990); this may prove critical for the investment's profitability.

Whatever the reason that results in cost overruns, it could prove detrimental for the project's success. Specifically, the project becomes more expensive for the concessionaire to develop, the profit of the shareholders is reduced, the concessionaire's credibility is jeopardized, the project's financing is affected and conflicts between the lenders and the main developers of the project may occur.

Complex financial structure of BOT projects (C16F)

The financial structure of BOT projects is very complicated, due mainly to the great number of stakeholders involved and financial agreements signed. In most cases, financing is not covered by only one organization; there is more than one creditor and sponsors are insured individually to several insurers. This complex financial structure, although it is described thoroughly in the agreements, can be a risk generator, especially in cases when the cash inflows cannot serve all requirements or when cash outflows exceed original estimates and the stakeholders are not willing to undertake extra costs.

Lack of co-operation in case of new initiatives (C17F)

Managing a BOT project includes dealing with unexpected problems and taking advantage of opportunities. Emergency situations, which are not considered in the various contingency plans that have been developed earlier, demand initiatives that ensure the maximum possible benefit of the concessionaire's investment. The implementation of such initiatives requires co-operation among the stakeholders in order to address the cost and profits implications. A lack of this co-operation may result to disagreements among the stakeholders and missed opportunities for higher profitability.

Insufficient performance during operation (C18F)

Performance during operation is evaluated with methods and tools described in the project agreement or

relevant appendices. Every activity concerning operation and maintenance has specific performance standards that ensure quality of the product or services offered and compliance with the agreements. Insufficient performance generates both financial and legal implications, such as: (a) imposition of fines according to relevant contract provisions, (b) reduction of the product's demand and consequently reduction of earnings, (c) discouragement of sponsors – especially if profit is at stake – from contributing further to the financing of the project and (d) legal implications between the owner and the concessionaire or stakeholders with additional costs for resolving disputes.

Lack of guarantees (C19F)

Governmental guarantees ensure all stakeholders and especially the financiers and the lenders that the project will reimburse their investment; these guarantees are essential to attract participants in a concessionaire scheme and raise financing from credible sources. In many cases, host governments are willing to offer a minimum guaranteed income (an agreed fixed amount or the purchase of a certain amount of the product or service offered, e.g. electricity from a power plant) to attract interest, enhance the security package and ensure the concessionaire's commitment to the success of the project. In essence, the government bears part of the commercial risk for the benefit of the concessionaire to attract the interest of potential bidders.

Banks and financial institutions as lenders for a BOT project are concerned with the project's success to the extent that the payment of loan interests and principal are ensured according to the agreed terms. Their revenue will not vary according to the commercial price of the project's product or service; thus if governmental guarantees for repaying loans exist, it is easier to join the financing scheme.

Lack of a guaranteed income and guarantees to lenders discourages potential developers, lenders and financiers to participate in the tender process and increases the concessionaire's exposure to risk after construction completion and therefore jeopardizes the project's viability.

Financing risk (C20F)

Financing of a BOT project is the key issue for success. The challenge of financial structuring is to establish the appropriate combination of funding sources to ensure a sound financial structure for the project and mitigate financing risks. The financial plan for a BOT project must be sound and flexible to contingency plans that secure financing against delays, failures to obtain the required amounts of funds or approvals for additional loans, etc.

Until completion of the project's construction, funds are raised from loans by financial institutions, equities and sponsor's own capitals (Price, 1996). Loans are granted by banks (e.g. the European Investment Bank) or other type of financial institutions (e.g. insurance companies, brokers, mutual saving banks, investment-type financial institutions, trust companies, etc.) (Papadopoulos, 1993). Domestic funds are also encouraged to participate in the financing scheme to motivate the domestic market and link an infrastructure project to the country's economy. Domestic financing also provides a further insurance for the government concerning successful completion of the project. However, raising domestic finance is usually not easy due to weaknesses in the economies of developing countries (immature stock markets, lack of private funds, insufficient structure, etc.). In this case the domestic market is excluded from the project and the financing risks are less dispersed. When foreign financial institutions and sponsors undertake the whole project financing, they are reluctant to provide substantial funds unless these are highly secured. Connecting financing with the project's progress is an example. However, this usual arrangement, although it protects the project's sponsors, does not ensure financing because any complications in the completion process have a direct impact on the project's financing. Another important issue is the availability of funds. The ability to raise funds on time depends on the success of the overall investment strategy of each stakeholder in a BOT project. The investment portfolio of each sponsor (beyond the involvement in a particular BOT project) shall include both long- and short-term investments to ensure timely raising of funds for the project. Any delay directly affects the construction schedule and generates additional costs. In the operations/maintenance phase, part of the income earned by the project's commercial exploitation is used for project financing and, therefore, a non-profitable exploitation of the project directly and negatively impacts the financial plan.

Market-rooted risks

Loan risk (M21F)

The loans granted to the concessionaire to fund the construction of a BOT project can be of several types; short- or long-term loans, with fixed or floating interest rate, with simple or compound interest. The type of the loan, the cost, which includes all necessary costs to take it out and the interest rates to repay it and any necessary specific provisions are included in the specific loan system that governs the whole lifecycle of the project.

The appropriate percentage of loans to the overall funding plan is a function of many parameters including, among others, considerations of conflicting interests between the lenders and the borrowers, credibility of the lending organizations and the borrowers, ability for additional loans or renewal of the existing ones and safety of the debt amortization schedule.

A non-protected loan system against all risks would discourage potential lenders from funding the project in the first place or would force them to take extra security measures for their investment with a consequent overburden of the total costs. Difficulties of the concessionaire in serving the debt of loans can cause imposition of heavier loan conditions such as additional guarantees, stricter supervision measures, higher interest rates, faster debt amortization, restrictions in dividends and stricter requirements for balanced liquidity. In extreme cases, lenders could even claim to undertake the project.

Fall of demand (M22F)

The demand for the product or service offered by a BOT project is not guaranteed. The future preference by the end-users may be adversely affected by several parameters. The economic environment is one of the most important of them. An increase of the inflation or a devaluation of the currency reduce the purchasing ability of the users and, therefore, diminish demand.

The guarantees provided through the off-take agreement only partially cover the concessionaire if the existing rate of return is rarely sufficient. The risk of the fall of the product's or service's demand is very important and should be confronted adequately.

Competition risk (M23F)

Projects developed under the BOT scheme are usually serving public needs either individually or as parts of an infrastructure network. Satisfying such needs (energy, transportation, communication, etc.) is primarily a state's responsibility, but there are great potential of involvement of private enterprises depending on the host country's economic system. As a result, each market, depending upon different public needs, may be a monopoly, oligopoly or an open market. The fact that BOT projects are mainly large infrastructure projects most often renders the concession company a player in an oligopoly market with the consequent advantages (e.g. larger market share, few competitors) and disadvantages (e.g. pricing policy imposed by the market and tough competition). However, the case of the competition in an open market is equally possible. Therefore, at the planning, bidding and negotiation stage, it is absolutely necessary for the potential developers to:

(1) identify correctly the market's competitive characteristics in order to determine the revenues for the services/products offered in the future; and
(2) prepare a sound commercial package that will guarantee viability and profitability of the project.

A thorough, detailed and faultless research on issues such as structure and size of the market, market shares, intention of competition, competitive advantages concerning quality, promotion, etc. results in a commercial appraisal of the project. This appraisal offers a sound base of arguments for guarantees in the negotiation stage concerning:

(1) protection from competitive projects (including those in public ownership);
(2) low rates of development and deficiencies of the public authorities planning; and finally
(3) the project's viability and profitability.

On the contrary, inefficient estimation of the competition issues jeopardizes the project's success.

Taxation risk (M24F)

The tax rate is always an important factor for the realization of an investment. The concessionaire is interested in retaining a steady tax system for the whole lifecycle of the project. That can be achieved through special tax provisions that refer to foreign investments. Such provisions are common in developing countries in order to attract foreign funds to the national economy, and they include reduced tax rates for corporations, tax shields, etc.

However, a steady tax regime for a period of more than 30 years is not always feasible. Because there is no particular tax treatment for certain investments, but different kind of provisions refer in general to foreign funds invested in a host country, it is expected that such provisions are amendable. A tax reform that imposes heavier taxes for both corporations and individuals can affect adversely the profitability of the project. Increases of tariffs, taxes and custom duties, cancellation of tax relieves or exemptions and similar provisions directly reduce profits for the concession company. On the other hand, a heavier taxation leads to the reduction of the consumer's purchasing power, thus causing fall of demand. The stronger such a contingency would be, the more discouragement for potential investors it could cause.

Fluctuation of the inflation rate (M25F)

The inflation rate affects the project from the construction to the transfer phase. An increase of the inflation

causes increase of production costs (supplies, wages, operation costs, etc.), which is transferred to the product's or service's purchase value to cover the loses. Furthermore, this affects negatively the demand as the purchasing power of the end users is also suffering from increases of inflation rates. Therefore, income from revenues can be seriously affected and cause significant deviations from the economic plan of the project. Another impact of inflation increase may refer to the repayment of the loan. If this is agreed on a different currency than the local one, then increase of the inflation and convertibility will cause an unanticipated loss of profit.

Problems may also arise by a constant reduction of the general pricing level (deflation). The risks connected with deflation may be more serious than the ones connected with inflation. That is because there is reduced efficiency of the traditional economic means to face such a problem and, therefore, unconventional and extremely interventional measures can be taken (most often related to the monetary policy). If such measures proved inefficient, there would be a worsening of the economic conditions, which mainly affects the productivity and employment. Such an economic environment undermines the viability and profitability of a BOT project.

Currency risks (M26F)

In most cases financing of a BOT project is achieved with foreign investments. Therefore, special care should be taken in order to avoid currency risks. Such risks could be related to the exchange rate (Kapila and Hendrickson, 2001) or the ability to exchange local currency to foreign currency or transfer it to foreign bank accounts.

Because the revenue and consequently the whole income will be in local currency, while loan repayments and maybe supplies will be in foreign currency, a downfall of the exchange rates could be very dangerous for the project.

Equally dangerous could be any obstacles to convert the currency freely and transfer it abroad. This contingency could generate loss of profit either by preventing exploitation of foreign bank accounts privileges or by additional convertibility costs to lift restrictions.

Unfavourable international economy (M27F)

The main stakeholders in BOT projects have business activities that are not limited by geographical borders. In the current globalized economic environment with the national economies being more and more linked to each other, any business attempt is linked and affected by the overall business environment. An international economy in recession can be a drawback for the success of a BOT project at all stages of its lifecycle.

Conclusions – future work

Financing of BOT projects is a primary responsibility of the concessionaire and only in some cases governmental aid is contributed. Therefore, all the related risks are undertaken by the concessionaire and cooperators such as sponsors, insurers and lenders. The number of the stakeholders involved, the complexity of relations between them, the conflicting interests and the long period of the concession are features that puzzle the stakeholders of a BOT project. A successful project requires a proper risk analysis of financial risks in order to mitigate risk effects. This paper contributes to the fulfilment of this need. In total, 27 BOT financial risks are identified and their content is presented, in detail, to provide the risk analysts involved in BOT projects with a comprehensive list of contingencies and risks associated with the economic aspect of the development of such projects. These risks are classified considering both the project's lifecycle phase where they can potentially occur, and the source for each risk. This is an innovative risk classification scheme for BOT projects that aims to help in establishing a common base for all stakeholders to use in their risk analysis when approaching a BOT project and facilitate the procurement of the project.

A further step towards the creation of a new and useful tool for all types of BOT construction projects would be the development of a risk assessment model that would incorporate also other types of risks (such as technical and legal risks) and the effect of the human judgement in the risk analysis process.

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