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Factors that affect success of bot projects. Hermes airports case study

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of

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FACTORS THAT AFFECT THE SUCCESS OF BOT PROJECTS HERMES AIRPORTS CASE STUDY

Master Thesis

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ABSTRACT

The execution of infrastructure projects in developing countries requires large investment in capital, foreign financing resources, advanced technology and not only technical but also managerial knowledge. The process of project development is complex, time-consuming, and expensive.

The economical end political environment has pushed governments to find other ways to complete these projects. Since the biggest problem is the finance raise, governments have found a solution in the outsourcing and specifically in the BOT (Build – Operate – Transfer) model.

The private funding in the build-operate-transfer (BOT) arrangement not only reduces the strain on the government/public pocket but also facilitates more innovations by harnessing the skills, technologies, and operational efficiency of the private sector. This arrangement also reduces the risks and responsibilities of the public sector as most of these are transferred to the private sector.

To develop a successful BOT project, its promoters should ascertain that the project will be politically, socially, legally, environmentally, economically and financially viable.

The main objective of this research is to give a clear description of the critical success factors of a BOT project in general but also specifically in the aviation sector, using Hermes Airports as a case study. Different factors taken from the existing literature, regarding various BOT projects will be categorized in a checklist and will be given a level of significance. After research and questionnaires with experts in the aviation sector we will choose the most significant of the CSFs on the checklist.

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CHAPTER 1: INTRODUCTION

The execution of infrastructure projects in developing countries requires large investment in capital, foreign financing resources, advanced technology and not only technical but also managerial knowledge. The process of project development is complex, time-consuming, and expensive. The financial risk is high, competition is keen, negotiations are extensive, and opportunity costs are considerable.

The private funding in the build-operate-transfer (BOT) arrangement not only reduces the strain on the government/public pocket but also facilitates more innovations by harnessing the skills, technologies, and operational efficiency of the private sector. This arrangement also reduces the risks and responsibilities of the public sector as most of these are transferred to the private sector. Since all of these are required, some governments might not be able to execute these projects and fulfill the growing need in the infrastructure business. The economical end political environment has pushed governments to find other ways to complete these projects. Since the biggest problem is the finance raise, governments have found a solution in the outsourcing and specifically in the BOT (Build – Operate – Transfer) model.

To develop a successful BOT project, its promoters should ascertain that the project will be politically, socially, legally, environmentally, economically and financially viable. A detailed and accurate feasibility study should be followed in order to determine the project's viability, which includes many qualitative and quantitative decision factors. These studies are usually expensive and time consuming, in order to be properly completed. These feasibility studies were usually prepared by private consultants in the past, but they were concentrated mainly on the quantitative decision factors and overlooked the project's qualitative decision factors. The result of this was that many BOT projects failed to be completed or were suspended, as the feasibility study failed to subjectively evaluate the project's success factors and was insufficient to conclude the viability of the operation.

Over the last fifteen years the BOT procedure of project development has gained acknowledgment and acceptance in many countries as a way to design, construct, operate and manage large scale projects by private investors with very little cost to the government, as in developing countries, the governments do not have enough finances to carry out infrastructure development. We have to bear in mind though, that BOT project financing contains risks, as our experience from projects that were financed and constructed in this way highlights the fact that there have existed not only successful cases but also failed ones. Thus, the most important thing public authorities and government have to do is to use strict guidance and legislation in order to ensure the success of BOT projects. Also, in order to deploy a successful BOT project, the people behind it must ensure that the project will be politically, socially, legally, environmentally, economically and financially viable[1]**.** A very detailed and accurate feasibility study must be developed prior to the launch, which will include a lot of quantitative and qualitative decision factors, in order for the project to be successful.

[1] Shen L., Lee R.K.H., and Zhang Z. (1996). Application of BOT system for infrastructure projects in China. *Journal of Construction Engineering and Management*, 122(4): 319–323.

BOT projects can be of various types depending on the contractual and financial characteristics, they tend to share a very similar basic structure. This structured involves a number of corporations organized as a consortium, which plays various roles in the project's lifetime as a consultant, investor, project promoter, constructor, operator and owner of the facilities. As a consultant, the consortium carries out the needed feasibility study, provides the initial capital investment, negotiates the concession agreement with the government, promotes the project in order to raise capital during the pre-construction phase of the project. Usually, the sponsor is the constructor and main contractor who will build the facilities, and also the handler and owner of the project who will operate the facilities in order to generate revenues, serve the debt requirements and make profit. [2]

In the last two decades, Cyprus has transformed itself into a market-oriented economy. Investments from foreign countries have played a significant role in the process of economic development and BOT projects have emerged as one of the most preferred way of investment in the country. BOT project financing ventures have appeared as a very promising way of organizing a business of public interest, such as the financing of the two airport projects of Cyprus, in Larnaka and Paphos.

Hermes Airports undertook the management and operation of Larnaka International Airport and Paphos International Airport on 12 May 2006 for 25 years under a BOT Concession Agreement with the Republic of Cyprus. The concession agreement was the largest ever in Cyprus and the Build-Operate-Transfer project was the first of its kind in Cyprus. The new passenger terminal in Paphos opened in November 2008, and in Larnaka in November 2009, making this the biggest construction project that was ever undertaken in Cyprus. The airports offer world class infrastructure and the latest technology, emphasizing on providing high level of customer services to the passengers and customers.

Hermes is a company registered in Cyprus, an international consortium of 9 shareholders, representing a mix of Cypriot and international partners including Bouygues Bâtiment International (22%), Egis Projects (20%), Cyprus Trading Corporation Public Limited (11.34%), Hellenic Mining (11.33%), Vantage Airport Services (11%), Aer Rianta International (11%), Iacovou Brothers Construction (5.665%), Charilaos Apostolides Public Limited (5.665%) and Aéroport Nice Cote d'Azur Chambre de Commerce et d'Industrie (2%). The concession was awarded for the airport over a period of 25 years and the cost for work at both airports is estimated at €645m. The new Paphos and Larnaka airport terminals opened in November 2008 and 2009 respectively, offering world class facilities to 11 million passengers.

The Hermes Airports' Cypriot and foreign shareholders brought local and international expertise to the airports. One of the shareholders, Vantage Airport Services, is the leader in providing management services for the length of the agreement and acted on behalf of Hermes in overseeing the design and build contractor during the expansion of the two airports.

Under the contract with Hermes, Vantage Airport Services, was responsible for bringing together qualified personnel, including Hermes CEO Alfred van der Meer, to manage and operate Larnaka Airport, as well as ensuring staff were ready for operations at both Paphos and Larnaka.

[2] Savvides, D. (2016). The Conceptualisation of a Build – Operate – Transfer (BOT) Project

There have been big obstacles in their way of completing the project, that derive from the country's political environment, the policies followed by the government and the interaction and cooperation with the local partners. Also, as the Airport BOT project managers are selected both from the public and the private sector, they bring into the project different strategies that reflect their professional background. The bigger the complexity of the government or private operators' target is, the more difficult is for the project managers to success and achieve their mutual goals.

In order to enhance the performance levels in Cyprus Airports, before the introduction of the BOT scheme, the government has used extensively public administration, to organize, operate and maintain the state's airport services. That was the traditional philosophy of the time that would lead to social development and economic growth. The role of the state in the administration not only in the airport services but also in the economy in general has seemed to change. The criteria of evaluation, in terms of both strategy and performance, which are focusing not only in financial but also social goals, has given an impulse for better improved performance outcomes in the organization and management of public social-economic entities. [3]

The main reasoning behind the Cyprus Airports BOT project was that the consortium that would be formed to finance it, it would also bring not only significant financial resources, but also innovative technologies as well as management improvement in the areas of public governance. In that way, it would help not only the Cyprus Airports but also the state-held enterprises to improve in various areas, resulting in market growth with the help of the private sector. Government authorities, by recognizing their weak market positioning in the airport services sector, in terms of quality, productivity levels and output, have seeked in the past to achieve economic sustainability by taking advantage of state grants. The Cyprus Airports BOT financing model seemed to be a strategic move for development that would help the government in terms of budgetary limitations and secure safe and prompt upgrade of a vital infrastructural project that would help restore Cyprus to a regional hub strictly adhering fully to the EU procurement rules and procedures.

The main objective of this research is to give a clear description of the critical success factors of a BOT project in general but also specifically in the aviation sector, using Hermes Airports as a case study. Different factors taken from the existing literature, regarding various BOT projects will be categorized in a checklist and will be given a level of significance. After research and questionnaires with experts in the aviation sector we will choose the most significant of the CSFs on the checklist.

The research will be organized as follows:

Chapter 2 will be a summary of literature review about critical success factors for BOT projects in general. Because of the nature of the various BOT projects, critical success factors for one type might not be a critical success factor for another. Factors with same or close meaning will be put together and all factors will be categorized in groups. Each factor (or group of factors) will be described using relevant examples from the literature.

[3] Savvides, D. (2015). Build Operate and Transfer (BOT) – The Case of Cyprus Airports.

In Chapter 3 the research methodology will be discussed and the possible sources of critical success factors of BOT projects in general will be discussed. Also, the experts which will be answering the questionnaires will be chosen.

Using the possible success factors presented in Chapter 3, in **Chapter 4** we will research on how these apply in a real case like the Hermes Airports in Cyprus and the BOT project which has started in 12 May 2006, under a 25 year BOT concession agreement with the Republic of Cyprus.

In **Chapter 5** the main findings of this research found by investigating the existing literature and from the questionnaires will be compared and will be discussed if these findings apply also on the Hermes Airports BOT project case study.

Finally, in **Chapter 6** some suggestions on future research in this particular area will be given.

CHAPTER2: LITERATURE REVIEW

The following articles were examined thoroughly in order to gather critical success factors that affected various BOT projects around the world:

- **ARTICLE No1:**
  Framework for Critical Success Factors of BOT Projects in China. (Qiao et al. 2001)

The infrastructure sector growth in China has been relatively slow compared with other sectors, like the industrial or manufacturing sector. Problems about energy shortage, lack of ideal transportation network, underdeveloped telecommunications and an obsolete water supply network and distribution system has held back the country's economic growth. The government of China has been trying to improve in all these sectors by investing a large part of its budget in infrastructure projects. The demand for larger funds has been increasing and the government was not in the position to provide the necessary budget to finance these projects. This is where project sponsors come to the fore. These are usually international infrastructure entrepreneurs trying to expand their businesses in foreign, usually developing countries. This companies bring to the developing country not only their ability of investment financing, but also managerial experience and technical skills.

The scheme of Build-Operate-Transfer provides a solution in infrastructure development problems that includes private participation, commercial principles, competition and innovation.

The first successful BOT project in the province of China was the Shajiao B electric powerplant. It was awarded in the early 1980s. After that, more than 100 infrastructure projects according to the BOT scheme have been awarded. The Laibin B powerplant in built in Guangxi was the first state approved BOT project in China. Other BOT projects were the Changsha power plant in Hunan, the Puqi power plant in Hubei, the Chengdu water plant in Sichuang, and the Da Chang water plant in Shanghai. The application of the BOT method in Chinese project development and the range of BOT applications has been gradually expanded.

Until the article of Qiao was published in 2001, there was no research about the critical success factors of China's BOT projects. The process of a project development is not only complex, but also time consuming and expensive, with high financial risk. That's why the BOT promoters have to adopt flexible attitudes and calculate all the risks. Their proposals must adapt in changes of the environment and government's requirements. If the project sponsors manage to properly sustain these factors, they will end up winning and achieving these BOT projects.

From the win of the BOT contract to the final step of the transfer back to the government, there is a long way and the phases of the project may take a long time. Each phase's success will be critical to the success of the next phase. The critical factors that determine the total success in winning a BOT contract are, according to Robert L. K. Tiong[4]

- Entrepreneurship

4 Robert L. K. Tiong (1992). Critical Success Factors in Winning BOT Contracts

- Picking the right projects
- Strong team of stakeholders
- Imaginative technical solution
- Competitive financial proposal
- Inclusion of special features in the bid

First of all, **Qiao** identified about 50 factors that are associated with BOT projects in China and separated them in six phases according in the lifetime of project implementation. These phases are the preliminary qualification evaluation phase, the tendering phase, the concession award phase, the construction phase, the operation phase and the transfer phase. These factors where then filtrated by the author, according to the author's experience and after discussions with academic staff in the author's universities, case studies, discussions and interviews with BOT project sponsors and developers, contractors, government representatives and consultants of the projects.

After the filtration of the factors, the final list was then formed in a questionnaire used to conduct the survey. The survey via questionnaires was conducted to BOT project companies employees and government officials in order to evaluate the importance of each one of the success factors that made it in the short list. Also, constructive interviews of a 30 minutes average duration were conducted to selected employees of these companies and government authorities representatives in order to express their views relating to BOT projects.

In the third stage of his research, **Qiao** chose three BOT projects constructed in China that were studied in detail to check if the critical success factors found from the questionnaire and interviews apply also there. The case studies provide more in depth information and they add to the ones obtained from the previous surveys.

The questionnaires and interviews were conducted with selected professionals. In order to ensure that the responders would be preferably upper level managers, it was sent to the managing directors of the companies. In the case of government, senior officers from the government and local authorities who were in charge of BOT projects were chosen. The reliability of the survey results is high because the responders

a) are at the top management levels in their companies
b) are representatives of various types of BOT projects
c) have experience in international BOT projects
d) have been involved directly in Chinese BOT projects
e) regarding the government authorities, deputy chief of related departments responded to the survey

A data analysis is conducted, to find the similarities in the opinions of the project promoters with those of government official about the relative importance of critical success factors. To ensure that the results are consisted, the author conducts reliability test and repeated measurements are made. The analysis is done using the SPSS statistical software, which gives a

Cronbach's alpha of factor items greater than 0.6, which indicates a high level of internal consistency. The result of the analysis is that there is a positive agreement between project promoters (foreign investors) and government officials on the importance of the critical success factors chosen.

Finally, in the fourth stage, a framework for evaluating critical success factors in future BOT projects in China is proposed, which reflects the importance of the CSFs in supporting the competitive strategies for BOT projects.

A BOT project in general, is going through various procedures that are being affected by many internal and external factors, during the various phases of the project. The CSFs in **Qiao's** research were derived through research of research in literature review and interviews with projects investors and government officials involved in the projects, and were also validated through research and case studies. A total of thirteen CSFs were found, both independent but also dependent ones, and they are separated in five categories.

Category A: Preliminary Evaluation Phase

CSF No1: The appropriate project identification.

The greater the appropriate project identification, the higher the possibility of a good outcome for both the investors and the government regarding the success of the BOT project. As there is a long list of projects foreign investors can undertake, they must be cautious in selecting the appropriate projects and prepare their proposals. As the cost of the project can be very high, there has to be an accepted need for the project in order to be successful. The cost of the project must be in the boundaries that the foreign investors can afford. They will be more interested in the projects that have the largest potential of being more profitable for them, and in the projects that they are certain they can recoup their investment. Therefore, appropriate project identification is one of the most critical success factors for the outcome of BOT projects.

CSF No2: The stable political and economic situation

The more stable the political and economic environment is, the greater the possibility of success for a BOT project. The political will and economic stability of the government hosting the project is not only vital, but also a precondition for the completion of it. Because of the high speed economic expansion, and to attract foreign investments, the Chinese government has shown its intention to carry out its infrastructure needs in the form of BOT contracts. However, because of the Asian financial crisis, the authorities are currently warning for the accelerated approval of foreign currency financing. Therefore, it is necessary to carefully review the projects taking into account the economic and political situation of the foreign investors.

Category B: Winning BOT Contracts Phase

CSF No3: Attractive financial package.

The final determining factors in awarding the BOT concession are usually the commercial and financial considerations, instead of the technical elements. The financing package must be custom-made for the characteristics of the project. The ideal financial package must be founded on the standards of low capital cost, low operation and maintenance capital cost, low financial risk both to the government and the investors, minimum dependence on obligation adjusting capacity of undertaking incomes. A BOT project investor ability to offer an innovative, adaptable, and attractive budgetary bundle will be one of the essential elements in the success of winning a BOT contract.

CSF No4: Acceptable toll/tariff levels.

The toll/tariff levels have to be reasonable from the customer's perspective yet additionally satisfactory to remunerate the investors and moneylenders of the project. Finding the perfect balance between these to interests is a difficult task. Low tariff levels is a must as the China is still a developing country so the government has to protect the public from over the top monetary costs. At the same time, the tolls have acceptable in order for the project to be profitable for the investors. In this manner, acceptable toll/tariff levels from both sides will positively affect the result of winning BOT contracts.

CSF No5: Reasonable risk allocation.

Because of the nature of BOT projects being financed primarily on a limited basis, with the funding being based on the cash flow that's generated by operating the project, the principal project security are just the cash flows and the project assets. This is the reason why the BOT sponsors are very sensitive and cautious about identifying the project's risks at a very early stage of its development. Effective risk recognition is vital for the projects success in terms of financing.

Category C: Construction Phase

CSF No6: Suitable subcontractor selection.

Subcontractor selection for a BOT project positively affects the result of the entire undertaking. Basically, the project company has to investigate the various characteristics of the potential subcontractors in order to choose the one who will best supplement its own capabilities. The potential subcontractor needs to have previous experience in BOT projects, specialization in the appropriate technical skills required by the project's nature, suitable management style, being trustworthy and financially credible. In addition to money-related prospective

aspects, essential qualities for the imminent subcontractors are management competence and complementary skills.

Category D: Operation Phase

CSF No7: High level of management control.

Management control is very important for the clockwork operation of the facilities. Modern organization planning strategies and computer-based management software and systems must be used in order to achieve the high level of management control needed for these large-scale projects. The western companies have adopted the empowerment method, which presupposes a high employee maturity level before implemented effectively. In a developing country like China, with a lower employee maturity level, a more imperative way of management has to be used.

Category E: Transfer Phase

CSF No8: Effective technology transfer.

The effective technology transfer is one of the most important CSFs for the success of a BOT project. After the end of the operation phase, the more advanced and developed sponsor is required to transfer the technology through a concessionaire to the local personnel of the project in the less developed country. The main aspects of the technology transfer concern the advanced management techniques and operational methods, as well as production technologies.

As the application of BOT projects is relatively new, with small history around the world, its methods may not be entirely understood and adopted by the potential foreign sponsors and the local government authorities, which affects the accuracy of selecting the most critical success factors of a BOT project. However, as China has entered the World Trade Organization, the opportunities for private companies investing in BOT projects in China has increased. The CSFs identified by the author and the proposed framework is very important for potential investors in China's future BOT projects.

- **ARTICLE No2:**

Identification and ranking of critical success factors for BOT projects in India. (Aayushi Gupta 2013)

A variety of projects all around the world, in a large range of sectors have been successfully developed under the BOT scheme. Through private funding, the strain on the government economy is heavily reduced. At the same time the use the skills, technology and efficiency of the private sector facilitates more innovations into the project. The risks and responsibilities are mostly transferred to the private sector, reducing the weight on the public sector's shoulders. These projects include construction works such as bridge, airports, roads, but also power and water supply systems. They even extend in the telecommunication and information technology sectors.

Indian industry has always needed improvement. In order to accomplish its infrastructure development needs the government would need approximately $514 billion in the period from 2013 – 2017 and $1025 billion in the next 5 years. Half of this investment capital would have come from the private sector. In some cases, the government would provide longer concession periods to the private investors to cover the additional cost in investment. Attracting private capital is a critical strategy to meet the resource shortage. Also, the public-private-partnerships (PPP) give extra advantages of larger variety of infrastructure projects using the specialized expertise, the advance technology of the private sector and the increased efficiency in terms of operation and maintenance.

In the last 18 years of the PPP scheme in India, the majority of projectors were in the sector of telecommunications, power, ports and roads infrastructure that showed vey good progress in contrast to other sectors. Also, while there are a large number of successful projects, some of them were poorly designed and conceptualized that are very close to failure. Road projects account for about 54% of the total number of projects in India, ports for about 8% and other transport sectors have a lot less projects, 5 airports and 4 railways. In the urban infrastructure sector, 152 BOT projects have been awarded, with projects like bus terminal, water management and sanitation.

Previous research on the critical success factors for BOT projects has been conducted by Berry (1991), Tiong et al. (1992), Morledge and Owen (1997), Chua et al. (1999), Chan et al. (2004) and Saqib et al. (2008).[5] A large number of critical success factors were identified such as:

- Entrepreneurship and leadership
- Right project identification
- Strength of the consortium
- Technical solution advantage
- Financial package differentiation

5 Aayushi Gupta(2013). Identification and ranking of critical success factors for BOT projects in India

- Differentiation in guarantees
- Ability to provide a suitable transfer package
- Built-in flexibility for future growth and changes
- Supportive and understanding community
- Short construction period
- Picking the right project
- Competitive financial proposal
- Appropriate risk allocation
- Available financial market
- Favorable investment environment
- High degrees of commitment
- Share vision between the client, architect and contractor
- Share responsibility between public and private sectors
- Stable political and social environment

Aayushi's research is focused on the CSFs of BOT projects in India. Using literature survey and personal interviews of experts identifies certain factors that appear to be critical for the success for BOT projects in India. From all the CSFs identified, by using the analytical hierarchy process he chooses the top ten and compares them with CSFs identified by previous studies. Also, the top four CSFs are further discussed.

The preliminary questionnaire was formulated by carrying out a thorough literature review that resulted in the identification of 45 CSFs for BOT projects. A pilot survey and personal interview was carried out with academic experts and industry practitioners, that resulted in reducing the number of CSFs to 29 by deleting and combining some of them. The 29 CSFs were divided into six groups:

Group A: Prevailing environment

A favorable and promising environment is more likely to attract private investor in developing public infrastructure projects. A favorable environment by means of political, legal, economical and commercial. A business unit and the legal framework within which will work is established. The business units must have a complete picture for the market within they work. The government is in the best position to eliminate the fear of the private sector about the involving political risks, such as expropriation and nationalization. For every country or project, government guarantees, and support have to be given to manage certain risks that would be better managed by the government like changes in law, corruption, delays in approval of permits and others. There is need for political support, to eliminate the staff concern for losing their jobs, and to promote the effort of BOT project investors through the press. Sensitive movements for environmental concerns, makes the investors hesitant from investments in large infrastructure projects. Government support in such projects plays a crucial role to attract the investors.

Group B: Financial viability

The financial viability is critical for the success of any project. Especially of the BOT projects, the government funds are insufficient, so the projects are based mainly on private funds. The factors that affect a BOT project in terms of financial viability are: long term demand for the services or products offered by the project, limited competition from other companies already in the market, sufficient profitability of the project, long term cash inflow and long term availability of suppliers needed for the operation of the project. [6] The short construction duration plays also a vital role in the success of the project and its financial viability, since the cash inflows will start earlier, and the consortium will take advantage of a larger operation period to cover the construction costs. Also, the public will enjoy the benefits of the completed facility earlier. As some projects may not be financially viable, the government owes to provide project specific support to the sponsors to make them financially viable, like viable gap funding, foreign exchange guarantee, fiscal benefits and other initiatives.

Group C: Concessionaire consortium

One of the most important issues which affect the success of BOT projects is the selection of the right private sector contractor which will complete the project. It is necessary to establish a set of selection criteria which will lead to the selection of the best BOT sponsor to get the job done. The concessionaire has to undertake a lot more commitments and deeper risks than in a normal project due to the larger complexity of a BOT project. Therefore, the selection of the right concessionaire is directly connected with the success of the project. This is achieved through the tendering process. The criteria of the evaluation and methods which are used are transparent to ensure that the competition will be fair between the tenderers. The more transparent the selection procedure the better is the competition for the current and the future BOT projects. The most important success factors in competitive tendering for a job is technical and financial strength[7]. The design of the future facilities is assessed in a life cycle scenario and modern engineering techniques are used to find the ideal benefit/cost profile of the various proposed technical solutions. The concessionaire also needs to have a capable project team and good relationship with government authorities, as well as good management skills.

Group D: Financial package

The financing structure of BOT type projects is usually non-resource or limited resource. The lenders of the project primarily take into account the future cash flows generated by the project for repayment of the loan and to the value of the project's assets as a collateral. The general funds or assets of the project sponsors are not accessible by the lenders because the concessionaire in reality serves the purpose of a carrier where project assets, project related contracts and cash flows are separated from the projects sponsors entities. In this way, the financial investments of the sponsors and exposure to

[6] Xueqing ZHANG (2005), Critical success factors for public private partnerships in infrastructure development

[7] Robert L.K. Tiong (1996), CSFs in Competitive Tendering and Negotiation Model for BOT Projects

project liability is greatly reduced as the projects are mainly financed by debts.[8] Taking into account the responsibilities undertaken and the risks associated with the concessionaire, we can assume that a strong financial capability of the concessionaire is required to assure the successful completion of the BOT project.

Also, taking into account the expected users' affordability, if the project is associated with products or services the users have to pay for, appropriate toll levels have to be established.

Group E: Risk allocation

The three main participants of a BOT project are the government or the local authorities, the sponsor or concessionaire and the lenders. Each member of the project is assigned the part of the risk which is more suitable to handle.

Starting from the lenders, as the straight equity participation is very low in these types of projects, the financial risk is handled by them. The lenders are responsible to look at the cash flows of the project and see them as the funds for repayment for the loan.

Project risks such as commercial and technical risks related to construction, operation and maintenance of the project are handled by the sponsor companies, as they are best suited to manage them. Also, the commercial risks as the growth of traffic and in extend the growth of cash flows is also responsibility of the concessionaire.

Direct and indirect political risks are handled by the government.

Each type of risk is handled by the appropriate party.

Group F: Technical solution.

The BOT projects require from the concessionaire to have the flexibility to adapt to their requirements and adopt cost effective design with the same time keeping high standards on the quality of the provided service to the end users. A critical success factor in winning the tender for a BOT project would be an imaginative technical solution, which would provide a simple and cost-effective solution by using proven technology. This will give the solution a competitive advantage over other proposals and make it more attractive and acceptable to the government.

After identifying the CSFs of BOT projects and separating in groups, the next step is to find the most important of them and investigate further.

The top ranked success factor identified is the concession agreement which can be defined as an arrangement between the private sponsor and a public authority to provide service for an extended period during which has the responsibility to finance specified new projects. After the expiration of the contract, the new built assets revert to the public sector. The

[8] Tony Merna, Raghvendra Dubey (1998) Financial Engineering in the Procurement of Projects

concession agreement finds the issues which are important for limited recourse financing of projects in the sector of infrastructures like mitigation and unbundling of risk. These issues include the allocation of risk between the parties involved in the project, the precision and predictability of cost and obligations, the reduction of transaction cost and others. Other important concerns the concession agreement deals with are the transparency of the procedures involved and the financial support provided by the government. Its main objective is to secure the value of the public money and provide cost effective services to the final users. In order to attract private investors with improved efficiencies and reducing cost, which is necessary to accelerate growth of the country's infrastructure, a proper concession agreement is necessary, which will provide regulatory and policy framework between the parties. In a proper concession agreement, guidelines about risk allocation and supportive political, legal and commercial environment can be formulated. Therefore, the initial concessionaire agreement is the most determinative factor for the success of BOT projects.

The second most important factor for the success of the project is the short construction period. By finishing the construction works earlier, the project is released to the users earlier and so cash inflows start earlier, which means enhanced profitability of the project. From the results of Tiong's research[9], a shorter construction period not only reduces the overhead costs of the consortium, but also ensures the earliest date for the start of the roll revenue, thus reducing toll charges. At the same time, economic viability is critical for the success of BOT projects. As the construction period is part of the concession period, reducing the first will increase the number of years of cash inflow and will enhance the economic viability of the project.

The selection procedure of the concessionaire is also one very critical factor for the success of a BOT project. Competitive bidding and transparent selection of the most advantageous tender will ensure the best value of money to the public. After an evaluation of the technical, managerial and financial strengths of the bidders, the short listed of them are only required to specify the amount of grant they require. Lowest bid may not provide the best value to the government, so pre-qualification and short listing to identify the most capable bidders is vital for the success of a BOT project. The tender evaluation criteria and evaluation methods must be transparent to ensure fair competition and to avoid political favoritism of criticism regarding the concessionaire selection[10]. Corruption will greatly damage the public interest.

The BOT projects are usually financed on a non-recourse or limited recourse basis. The repayment of the debt and dividends to the sponsor will be paid only from the revenues generated from the project. Therefore, the project will be viable only if it has sufficient long-term demand and sufficient net cash inflow. A continuous revenue stream of the project is the foundation of the project finance as the project lenders don't have any recourse to funds other than the revenues generated by the project and its assets, which may not have and residual value[11].

[9] Robert L.K. Tiong (1996), Final Negotiation in Competitive BOT Tender

[10] Chan, A.P.C. , Lam, P.T.I. , Chan, D.W.M. , Cheung, E. and Ke, Y. (2010), "Critical success factors for PPPs in infrastructure developments: Chinese perspective"

[11] Merna, A. and Dubey, R. (1998), Financial Engineering in the Procurementof Projects

In **Aayushi's** research, AHP method was uses to identify the CSFs of BOT projects. The CFSs identified were found to be consistent with previous studies. Especially, "short construction period" and "selection procedure of concessionaire" were identified to be in the top ten factors which affect the success of BOT projects.

By conducting personal interviews of project managers, contractors and government executives, Aayushi concluded that the BOT method does not a hands-off approach by the government. The BOT method transfers only a part of the risks to the private sponsor. The government seeks to utilize the money and expertise of the private sponsor in the best possible way. These funds have to be spent economically, efficiently and effectively. The added value of the public procurer money comes from the private sector innovation and skills in terms of design, construction, operation and management of the project.

Even though the risks regarding the design faults, construction delays and cost overruns are transferred to the private sponsor, however this risk transfer is misleading. Straight equity participation is very low is BOT projects so the risk regarding finance and financial guarantees is shouldered by the lenders. The providers of finance use the cash flows of the project as the repayment source for the loan. Also, part of the risk is held by the government. The failure of the project will lead to loos to the public in general and by extension to the government. So, there is a need for the government to develop guidelines in order to provide supportive legal, political and commercial environment for the project.

- **ARTICLE No3:**

CSFs IN COMPETITIVE TENDERING AND NEGOTIATION MODEL FOR BOT PROJECTS (Robert L. K. Tiong, 1995)

In developing countries, the build-operate-transfer model is widely used in the project development through the award of a concession to a private consortium to finance, build, manage and operate infrastructure projects. The process of winning a BOT contract is full of risks. The financial and technical strength of the private sponsor is probably the most important critical success factor which will be crucial for the fate of the BOT project.

As described by Tiong earlier in 1992[12], the process of winning a BOT project is complex, time consuming and expensive, with high financial risk and extensive negotiations. The sponsors must be willing to take calculated risks and be flexible in terms of attitudes and stance. The proposals must be adaptable to changes of circumstances and governments' demands. In the same article, six critical success factors are identified for the winning of BOT contracts which are: entrepreneurship, picking the right project, strong team of stakeholders, an imaginative technical solution, a competitive financial proposal, and the inclusion of special features in the bid. In the new article, the list of critical success factors is modified.

The six critical success factors for winning BOT contracts are:

- Entrepreneurship and leadership
- Right project identification
- Strength of the consortium
- Technical solution advantage
- Financial package differentiation
- Differentiation in guarantees.

These six CSFs, if combined and given the necessary attention, will lead to the win of BOT contracts.

There is also a positive agreement between the government and promoters on the importance of these CSFs. For a competitive tender to be successful, the sponsors must have a clear understanding of the importance the government has to these critical factors.

The selection of these CSFs was based on the research of documented experiences from successful BOT projects. The detailed studies were done on projects that were on different phases of their lifecycle, such as under negotiation, under construction and in operation. It was also based on interviews of representatives of BOT projects sponsors and government officials, as well as their consultants. The interviews were also validated through extensive correspondence.

For his research, the author developed three sets of questionnaires.

[12] Tiong, L. K. R., Yeo. K. M.. and McCarthy, S. C. (1992). "Critical Successfactors in winning BOT contracts." J. Constr. Engrg. andMgmt., ASCE, New York, N.Y.

The first one's title was "Critical Success Factors in Winning BOT Contracts" and the topics it covered was: a) General background of companies – Viability of BOT investments; b) Risks and uncertainties in BOT projects – Criticality of conditions for BOT projects; c) Constraints in promoting BOT contracts; Critical success factors and their subfactors – Barriers to CFSs d) Competitive advantage in BOT proposals. The first questionnaire was given to construction professionals to research the criticality of subfactors in winning general BOT projects.

The second was entitled "Evaluation of Proposals for BOT Projects". The third set's title was "Experiences in Tendering BOT Projects" These two sets were given to government officials and project's promoters respectively. The second set's topics were: a) Evaluation statement, criteria and weights; b) Quality of unsuccessful proposals; c) Competitive advantage in BOT proposals; d) Distinctive winning elements in best proposal; e) Final negotiations. The second set's covered topics were: a) Company objectives and information on BOT projects tendered; b) Reasons for unsuccessful proposals; c) Competitive advantage in BOT proposals; d) Distinctive winning elements in best proposal; e) Final negotiations. We notice that the second and third set of questionnaires were similar in contents. The aim of these two questionnaires was to establish a checklist of CSFs to support the establishment of competitive tendering and negotiation model that applies both for private sponsors and for governments.

The six CSFs may not be the necessary division, but they were derived through the research process of extensive literature review and interviews with construction professional involved in BOT projects. They were validated through case studies and survey research. They cover a full range if important aspects for promoters in proposal preparation and tendering. They also help to develop a research model for BOT projects. There are three typical phases that a BOT project promoter must go through: prequalification, tendering and detailed negotiation and selection.

The competitive tendering and negotiation model reflect the competitive strategies in proposal planning and preparation. It is also useful in developing a competitive advantage in a BOT proposal, as well as the distinctive winning elements. Potential BOT promoters must give special and continued attention to the model, the competitive strategies, the CSFs, and the distinctive winning elements in order to develop a superior proposal that will increase their chances of securing a profitable BOT contract.

During the tender stage, the promoters are invited to submit conforming proposals that comply with the tender guidelines. This will include detailed technical analysis and financial plans. The proposal must be both attractive technically and financially to the governments so that it will be shortlisted for
further negotiations. The CSF of strength of consortium will in this case provide the strategic capability to create a sustainable competitive position for subsequent detailed negotiations with the government and to meet their demands. The competitive position is achieved by the CSFs of technical solution
advantage, financial package differentiation, and differentiation in guarantees.

During the winning proposal phase, the technical solution and financial package will be scrutinized in great details, and the different elements and features diligently compared with the

other proposals. At this stage, the government has established the financial strength and technical capability of the consortium and the selection and negotiations are generally concentrated on the subfactors of these three CSFs: technical solution advantage, financial package differentiation, and differentiation in guarantees. The winning proposal will be a combination of subfactors in the three CSFs that provides the competitive advantage. These subfactors are termed the distinctive winning elements in the competitive tendering and negotiation model. The distinctive winning elements are defined as those elements that give the winning proposal the distinctive advantage over the other competing proposals during the final selection of a competitive BOT tender. Which of the subfactors will turn into the distinctive winning elements that cause the proposal to be the eventual winner depends critically on the ability of the negotiation promoter to address the government's specific concerns. The promoter must therefore fully understand the government's needs and concerns and be able to address them through the right package of distinctive winning elements.

After the preliminary selection is done and before the concession agreement is awarded and signed, there will invariably be extensive negotiations on the project credit structure and the security package. Governments often want to pass more risks to the promoter than the promoter can properly handle. For example, foreign exchange risks are particularly difficult for the private promoter to bear. It is therefore essential for promoters to understand the importance of the different financial and contractual elements as regarded by the government.

The analysis in this article showed that there are six CSFs that, if given special and continued attention by the promoters, would increase their chances of a successful outcome, and that each CSF also has it own subfactors. These six CSFs are:

entrepreneurship and leadership
right project identification
strength of consortium
technical solution advantage
financial package differentiation
differentiation in guarantees.

Both the governments and the promoters agree that the CSF of strength of consortium is the most important CSF. It is also concluded that there is greater importance attached to the two CSFs of strength of consortium and financial package differentiation by the governments than the other four CSFs. A combination of these factors should, however, form the basis of a total solution approach by the promoters to meet the needs of the government and to prevail against all odds, beat the competition, and eventually win the BOT concession.

The six CSFs are the factors which will form a useful process model for promoters involved in tendering a BOT project. In order to prepare a competitive and superior proposal, the promoter must construct a strong team and present a cost-effective solution. The promoter also has to offer a financial package that differentiates it from others and provides guarantees. The winning proposal depends on the ability of the promoter to provide the right combination of winning factors to the government.

- **ARTICLE No4:**

CRITICAL SUCCESS FACTORS FOR BUILD OPERATE TRANSFER (BOT) PROJECTS: LESSONS LEARNED FROM AIRPORT PROJECTS (MOHAMMAD KASHEF, 2001)

Developing countries are not able to build large infrastructure projects by themselves, as they require large investments, advanced technology and technical and managerial knowledge. Outsourcing would be a solution for the underdeveloped countries' governments, but the finance raising problem has led the governments introduce the Build – Operate – Transfer model. In this kind of model, private sector supplies the funds needed to carry out the construction of the project and also operates the project for the rest of the concession period to cover its fees and generate profit. After a specific period of operation, the ownership of the project goes back to the government (transfer phase)

There are also other types of agreements like Build Own Operate (BOO), Build Own Operate Transfer (BOOT) and others.

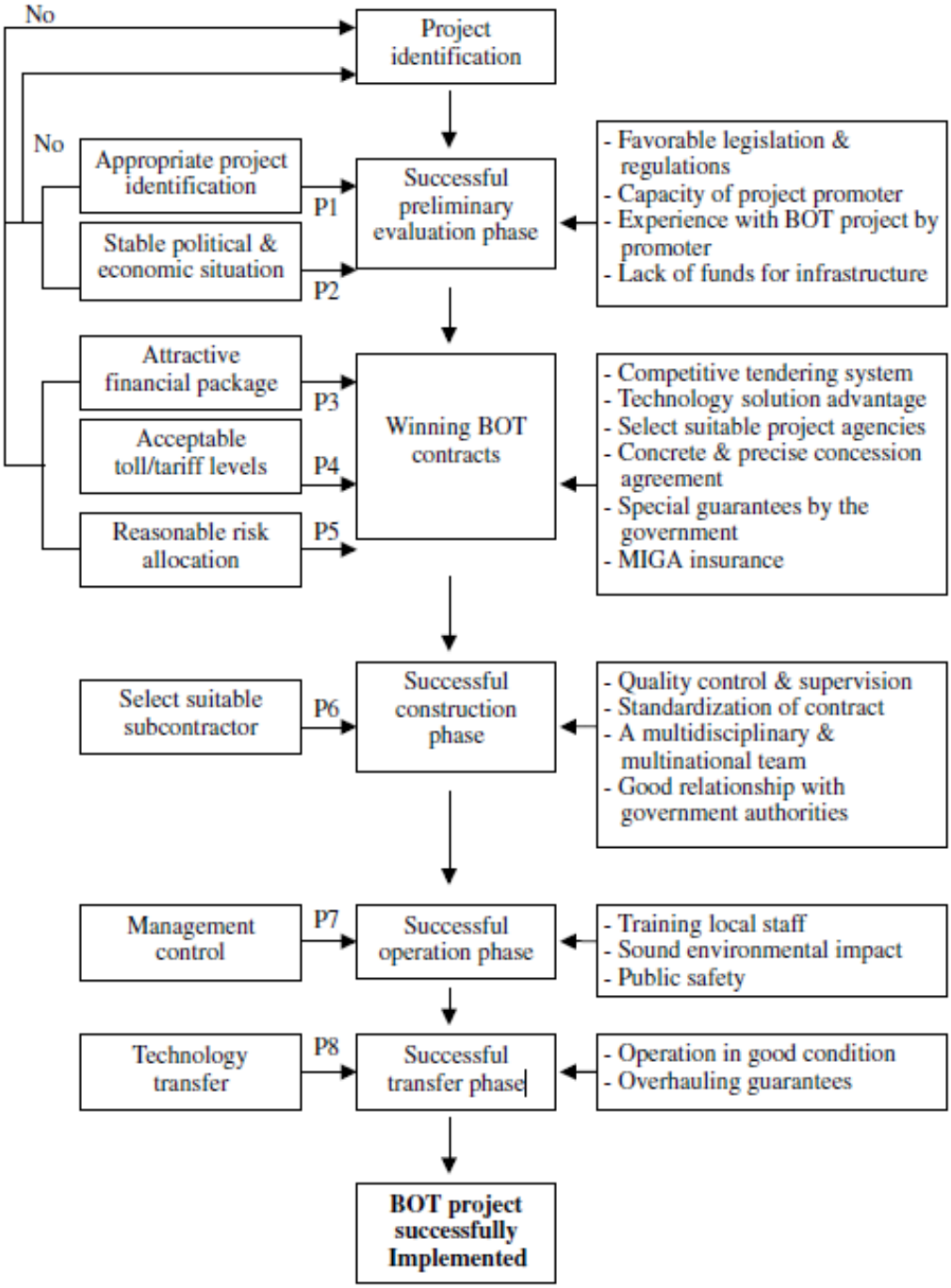
The main parties involved in a usual BOT project are a)The host government; b)The consortium of companies; c)The lenders; d)The EPC contractor; e)The suppliers; f)The buyers; g)The spare part suppliers; h)The operation contractors. The consortium oversees all the suppliers and contractors in all phases of the project and is the one which is accountable to the government.

A BOT project is more complex than traditional project. As a large part of BOT projects in Asia have failed, delivering a successful project needs to consider many factors during the projects lifecycle. By examining the existing literature about BOT projects, we can see that critical success factors are introduced about various types but not for airport projects.

The main objective of Mohammad's research is to identify the CSFs in BOT airport projects by examining real projects. Also, other important objectives of the research is to categorize the CSFs in a checklist, give them a level of significance and then updating the checklist by conducting personal interviews with the experts from the private sector and the government involved in the project.

Different authors have already studied various cases of BOT projects. Qiao et al (2001) identified 8 critical success factors for BOT projects in China: a) appropriate project identification; b) stable political and economic situation; c) attractive financial package; d) acceptable toll/tariff levels; e) reasonable risk allocation; f) selection of suitable subcontractors; g) management control; h) technology transfer.

They have also introduced a framework in the form of a flowchart presented below:


No
Project identification
No
Appropriate project identification
P1
Stable political & economic situation
P2
Successful preliminary evaluation phase
- Favorable legislation & regulations
- Capacity of project promoter
- Experience with BOT project by promoter
- Lack of funds for infrastructure
Attractive financial package
P3
Acceptable toll/tariff levels
P4
Reasonable risk allocation
P5
Winning BOT contracts
- Competitive tendering system
- Technology solution advantage
- Select suitable project agencies
- Concrete & precise concession agreement
- Special guarantees by the government
- MIGA insurance
Select suitable subcontractor
P6
Successful construction phase
- Quality control & supervision
- Standardization of contract
- A multidisciplinary & multinational team
- Good relationship with government authorities
Management control
P7
Successful operation phase
- Training local staff
- Sound environmental impact
- Public safety
Technology transfer
P8
Successful transfer phase
- Operation in good condition
- Overhauling guarantees
BOT project successfully Implemented

Li et al. (2005)[13] have summarized and organized 19 critical success factors from previous studies in the table shown below:

Critical success factor	Source
Strong private consortium	Jefferies et al. (2002), Tiong (1996), Birnie (1999)
Appropriate risk allocation and risk sharing	Qiao et al. (2001), Grant (1996)
Competitive procurement process	Jefferies et al. (2002), Kopp (1997), Gentry and Fernandez (1997)
Commitment/responsibility of public/private sectors	Stonehouse et al. (1996), Kanter (1999),NAO (2001b)
Thorough and realistic cost/benefit assessment	Qiao et al. (2001), Brodie (1995), Hambros (1999)
Project technical feasibility	Qiao et al. (2001), Tiong (1996), Zantke and Mangels (1999)
Transparency in the procurement process	Jefferies et al. (2002), Kopp (1997), Gentry and Fernandez (1997)
Good governance	Qiao et al. (2001), Frilet (1997), Badshah (1998)
Favorable legal framework	Bennett (1998), Boyfield (1992), Stein (1995), Jones et al. (1996)
Available financial market	Qiao et al. (2001), Jefferies et al. (2002), McCarthy and Tiong (1991), Akintoye et al. (2001b)
Political support	Qiao et al. (2001), Zhang et al. (1998)
Multi-benefit objectives	Grant (1996)
Government involvement by providing guarantees	Stonehouse et al. (1996), Kanter (1999), Qiao et al. (2001), Zhang et al. (1998)
Sound economic policy	EIB (2000)
Stable macro-economic environment	Qiao et al. (2001), Dailami and Klein (1997)
Well-organized public agency	Boyfield (1992), Stein (1995), Jones et al. (1996), Finnerty (1996)
Shared authority between public and private sectors	Stonehouse et al. (1996), Kanter (1999)
Social support	Frilet (1997)
Technology transfer	Qiao et al. (2001)

Also, Qiao et al (2001)[14] categorized the CSFs of BOT projects in phases which are:

a) Preliminary qualification evaluation phase

[13] Li B., Akintoye A., Edwards P. J., Hardcastle C., 2005. "Critical Success Factors for PPP/PFI Projects in the UK Construction Industry", Construction Management and Economics, Vol. 23, pp. 459–471.

[14] Qiao L., Wang S. Q., Tiong R. L. K., Chan T. S., 2001. "Framework for Critical Success Factors of BOT Projects in China", The Journal of Project Finance, pp. 53-61.

b) Tendering phase
c) Concession award phase
d) Construction phase
e) Operation phase
f) Transfer phase

In his article, Muhammad has researched 13 groups of critical success factors presented below:

1. Appropriateness of project identification

   By selecting a proper project to invest in, a project which satisfies a real need has more chances to have a successful outcome and be commercially profitable. Investors have to be very careful in selecting the project to invest in as a successful project will give them the chance to recoup their investment an also make satisfactory profit.

2. Thorough and realistic costs – benefit assessment

   The better the assessment of costs-benefits of a project is, the higher is the possibility of being successful. One of the most important tasks in the assessment of costs and benefits is how to treat uncertainty. Muhammad also mentions two projects which take place in Turkey, a successful and a canceled one. The first was canceled This project due to lack of preliminary design and adequate information, legislative problems and an inadequate tendering process. The second one was successful as the construction method and toll rates were fixed. So, the tenders were evaluated only by the criterion of operation period duration. So, the project conducted successfully.

3. Effective and competitive tender and procurement process

   The accurate tender evaluation method and procurement process significantly affects the success of a BOT project. It's also important to have a transparent process, with good communication between the public an private parties, with the private sector consulting and having responsibility for all decisions, and the public sector establishing clear criteria for making decisions.[15] Also, according to National Audit Office in UK, a successful and competitive tendering procedure must satisfy three conditions:

   a) A good tender list of companies invited to bid

   b) A clear specification of the department's requirements

[15,16] Li B., Akintoye A., Edwards P. J., Hardcastle C., 2005. "Critical Success Factors for PPP/PFI Projects in the UK Construction Industry", Construction Management and Economics, Vol. 23, pp. 459–471.

c) Competitive tension maintained throughout the procurement process

4. Technical feasibility of the project

The technical feasibility of a project can be examined from two different perspectives. The first one concerns the procurement phase, as the proposal which makes use of more advanced technology will meet the needs of the project and will be more attractive to the government. The second concerns the transfer phase, during which, advanced technology is transferred from a more developed country to a less developed one. Smooth technology transfer has a significant positive effect on the success of a BOT project[16]

5. Feasibility of quality, safety and environmental requirements

A BOT project must meet specific quality, safety and environmental requirements. The feasibility of these requirements affects the success of BOTs, as tough requirements will increase the construction and operation costs of the project. At the same time, some lenders will raise money only for projects that meet their own environmental requirements. Therefore, efforts need to be made to promote BOT projects with high efficiency a low pollution.

6. Reasonable and effective risk allocation

As the BOT projects are investment projects, their sponsors are sensitive in identifying the risks at the initial stages of the project. Risks have to be allocated reasonably, by assigning each risk to the party which is best able to mitigate it. To have a successful project, strategic risk allocation is essential.[17]

7. Integration and strong consortium structure

The consortium comprising countries must join together in a high level of encouragement and utilize their individual strengths. [18] Good communication and common goal symmetry will enhance strength and integrity of the consortium.[19]

8. Strong technical and managerial capabilities of the contractor

The construction contractor has a very significant role as in the success of the BOT project. To have a successful project, the contractor must have strong technical, managerial and problem-solving skills. As soon as construction phase is finished successfully, operation will start, and the project will generate revenues earlier.

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[17] Qiao L., Wang S. Q., Tiong R. L. K., Chan T. S., 2001. "Framework for Critical Success Factors of BOT Projects in China", The Journal of Project Finance, pp. 53-61.

[18] Li B., Akintoye A., Edwards P. J., Hardcastle C., 2005. "Critical Success Factors for PPP/PFI Projects in the UK Construction Industry", Construction Management and Economics, Vol. 23, pp. 459–471.

[19] Samii, R., Van Wassenhove, L.N., Bhattacharya, S., 2002. "An Innovative Public Private Partnership: New Approach to Development", World Development, Vol. 30 No.6, pp.991-1008.

9. Strong financial structure of the consortium

   The project developer (the consortium) must have enough financial and managerial resources and a strong financial structure to complete the project successfully.

10. Good consortium and government relationship and commitment

    The two main parties of the BOT project, the consortium and the government, have to commit their best resources to have a successful project at the end. Also, good relationship between these two parties increases the chance of the success of the project.

11. Stable and mature legal and administrative framework

    The existence of mature legal framework affects the success of a BOT project. As in some countries the BOT scheme is relatively new, their legal system does not include the necessary laws for the construction and operation phases, which causes problems to the success of the whole project.

12. Stable political and economic situation of the country

    The political and economical situation of the host country affects the success of the BOT project. The more stable the political and economic situations, the more successful is the BOT project. Countries with unstable economics and politics situation will be unattractive for potential investors.

13. Availability of adequate government support and guarantee

    The governments, in order to contribute to the success of the project, they will provide guarantee and support to the concessionaire, such as minimum revenue amounts, recognition of concessionaire right to operate existing facilities, approving requests for charges or increase in tolls etc. In this way the government lowers the risks taken by the developer and provides confidence to investors[20].

To conduct his research, Muhammad developed an initial checklist based on comprehensive literature review, with 13 CSFs. This checklist became the basis of his interviews. After that, two airports which were constructed under the BOT scheme were chosen for extended research. Their main difference was that they were constructed in two different countries.

The interviewees were selected from companies which are active in the aviation sector and have experience from various BOT projects. They also have currently some airports in the operation phase of BOT scheme. The interviewees sample includes a wide range of expertise,

[20] Zhang, W.R., Wang, S.Q., Tiong, R.L.K., Ting, S.K. and Ashley, D., 1998. "Risk Management of Shanghai's Privately Financed Yan'an Donglu Tunnels", Engineering, Construction and Architectural Management, 5(4), pp. 399-409.

from technical staff to CEOs and from Operation Managers to General Managers. This gave the author various perspectives on his subject of research.

The aim of the interviews is to check the validity of the checklist in airport BOT projects, to update the list if necessary by adding or removing CSFs, to collect real examples from the aviation sector and demonstrate the significance of the CSFs in this particular sector and to give a better picture to decision makers of future BOT airport projects.

Muhammad found that government and developer are the most important sources affecting critical success factors in BOT project. Also, the interviews show that "Technical feasibility of the project", "stable political and economic situation of the country" and "availability of adequate government support end guarantee" are the most important CSFs during all phases of the project. Paying attention to these factors should be done in initiating stage of the project. Countries without any legal system about BOT agreements are probably not suitable or high risk for conducting these kinds of projects.

To have a successful BOT project, having a strong consortium is not enough and paying special attention to these factors along with well study of host government rules and legislation is a critical task.

The findings of this research are helpful for the decision makers of future BOT projects, as they will help them in better planning of the projects and give them a better idea about critical success factors. By considering these, they will be able to generate some kind of formula which will help predict the success of their future projects from the very early stages.

As the interviews in Muhammad's research were conducted only with experts from the private sector, a more comprehensive research would also include interviews from government experts to present the critical success factors from the government perspective.

CHAPTER 3: RESEARCH METHODOLOGY

The procedure

After and extensive investigation of bibliography about the CSFs in BOT projects, books with main topic PPP (Public-Private partnership) projects, it looks that this subject (the BOT projects in general) have been thoroughly investigated by many authors in the past, regarding the general concept, their objectives, the rationale of BOT financing, the challenges, and the process of implementation. Also, both successful and unsuccessful examples have been researched.

The aim of this research is to specify the critical success factors affecting the BOT project in general, , analyze the collected data and then organize an agenda - questionnaire of critical success factors that possibly affected the success of the Hermes Airports BOT project. Using that questionnaire and by contacting people from different parties involving in that project, I will find out the real factors affecting the success of Hermes Airports projects through their eyes and in which level each factor affected the project.

To conduct this research, a comprehensive literature review has been done, which helped to put the various CSFs in categories. The quantitative methodology was employed in this research, which was conducted in two parts:

- In the first part, a widespread literature review to identify the success factors in BOT projects in general. The most significant previous researches are the articles analyzed in CHAPTER 2. The CSFs related to BOT projects that were identified and recognized success factors with the most agreement by these researchers, were used as a benchmark for further research. Hence, 13 success factors were identified in BOT infrastructure projects.
- The second stage consists of a survey questionnaire in the form of telephone interview to members of government officials and members of Hermes Airport to evaluate the criticality of the listed CSFs.

The sample

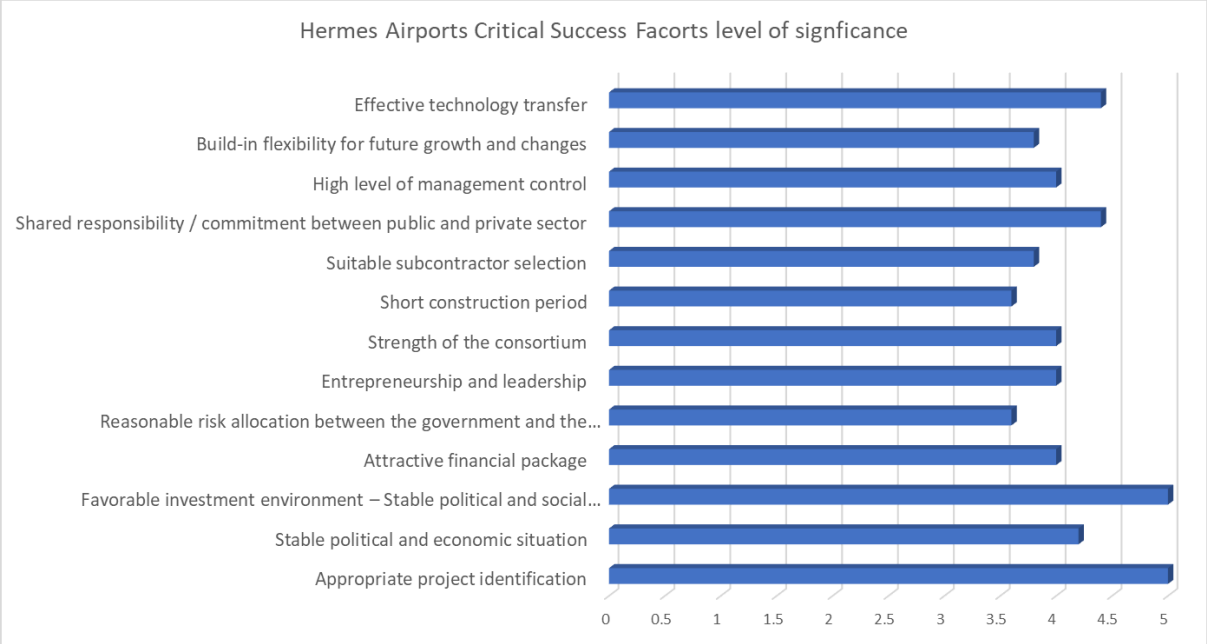
The questionnaire was conducted with BOT participants involved mostly in the construction and aviation sector. The questionnaire was distributed to government organization officials and employees of the Hermes Airports. Due to the specificity and complexity of the subject, the target group whom it is addressed is very specific and very limited. Only people who have been involved with these projects in managerial positions can give reliable answers to my questions. So, instead of sending the questionnaire to random people that may affect the findings of the research in giving probably unreliable results, I chose only who were involved in the initial stages of the project like the preliminary evaluation phase, and the construction phase, and also people who are involved in managerial positions and are being involved in the operation phase of the project and will probably be involved in the transfer phase which will happen in 11 years.

CHAPTER 4: FINDINGS AND DISCUSSION

The following table illustrates the position of the responders and their answers about the level of significance of each factor which affected the Cyprus Airports BOT project.

Experts were selected from companies which are active currently in the aviation sector operating the two airports of Cyprus, Larnaka and Paphos Airport under BOT concession, and also from the Public Works Department.

	Public Works Department	Airport Ground Services	Civil Aviation (Deputy Director)	Civil Aviation (Inspector)	Civil Aviation (Inspector)	**Total**
Appropriate project identification	5	5	5	5	5	**5**
Stable political and economic situation	5	4	4	4	4	**4.2**
Favorable investment environment – Stable political and social environment	5	5	5	5	5	**5**
Attractive financial package	4	4	4	5	3	**4**
Reasonable risk allocation between the government and the concessionaire	5	4	3	3	3	**3.6**
Entrepreneurship and leadership	4	4	4	4	4	**4**
Strength of the consortium	4	4	2	5	5	**4**
Short construction period	4	4	4	3	3	**3.6**
Suitable subcontractor selection	4	4	4	4	3	**3.8**
Shared responsibility / commitment between public and private sector	4	4	4	5	5	**4.4**
High level of management control	4	4	4	5	3	**4**
Build-in flexibility for future growth and changes	4	3	4	4	4	**3.8**
Effective technology transfer	4	5	4	4	5	**4.4**



As presented on the Table and on the graph, the highest significance between the thirteen critical success factors that were included in the questionnaire has been given to "Appropriate project identification" and "Favorable investment environment – Stable political and social situation" as they've achieved an average score of 5 out of 5 from all the questionnaires. Also, very important are considered the "Effective technology transfer" and "Shared responsibility/commitment between public and private sector". On the other hand, the mean scores of the rest critical success factors have been considered between 3.6 and 4.4. These factors comprise of "Built-in flexibility for future growth and changes", "High level of management control", "Suitable subcontractor selection", "Short construction period", "Strength of the consortium", "Entrepreneurship and leadership", "Reasonable risk allocation between the government and the concessionaire", "Attractive financial package", "Stable and political and economic situation". Therefore, in their viewpoint, all thirteen success factors are regarded as important, as their mean scores are greater than 3.

Moreover, in government organization (Public Works Department – Director of BOT Projects Management), "Appropriate project identification", "Stable political and economic situation", "Favorable investment environment – Stable political end social environment" and "Reasonable risk allocation between the government and the concessionaire" are considered the most important through the thirteen factors.

The representative from the Airport Ground Services considered as the most important factors for the success of the Hermes Airports BOT project the following: "Appropriate project identification", "Favorable investment environment – Stable political end social environment" and "Effective technology transfer".

In the category of people from the Civil Aviation department, they have rated as most important the “Appropriate project identification”, “Favorable investment environment – Stable political end social environment” and “Shared responsibility/commitment between public and private sector”.

The least important factors between the five people that answered the questionnaire belong to “Short construction method” and the “Reasonable risk allocation between the government and concessionaire”. The majority of the responders believe that the duration of the construction method will not play a very significant role in the success of a BOT project, and so does “Reasonable risk allocation between the government and the concessionaire”.

Below are presented the thirteen CSFs, ranked by their level of significance:

CSF	**Average**	Rank
Appropriate project identification	**5**	**1**
Favorable investment environment – Stable political and social environment	**5**	**2**
Shared responsibility / commitment between public and private sector	**4.4**	**3**
Effective technology transfer	**4.4**	**4**
Stable political and economic situation	**4.2**	**5**
Attractive financial package	**4**	**6**
Entrepreneurship and leadership	**4**	**7**
Strength of the consortium	**4**	**8**
High level of management control	**4**	**9**
Suitable subcontractor selection	**3.8**	**10**
Build-in flexibility for future growth and changes	**3.8**	**11**
Reasonable risk allocation between the government and the concessionaire	**3.6**	**12**
Short construction period	**3.6**	**13**

Eventually, although there are differences in the ranking because of the perspective the respondents of the questionnaire see the Hermes Airports project, the mean scores are very close and more than 3. Hence, all the 13 success factors that where selected as the most important to be included in the questionnaire are considered as important factors in BOT infrastructure projects and specifically for Hermes Airports.

CHAPTER 5: CONCLUSIONS – COMPARISON WITH LITERATURE FINDINGS

From the various types of Public-private partnership methods regarding project delivery in the case of large-scale infrastructure projects, like BOT (Build-Operate-Transfer), BOOT (Build-own-operate-transfer), BOO (Build-Own-Operate) and others, BOT scheme was selected for this research. The BOT works as follows: The host government gives the right to a group of private companies to finance an infrastructure project, construct it and operate it for a certain amount of time covering its fees and gaining profit. After this amount of time has passed, the consortium must return the projects ownership to the government which will continue exploiting it.

BOT is considered as the most widespread model for construction of infrastructural projects especially in developing countries. BOT method differs from the others in terms of financing method and the fact that the operating service is included in the concession agreement.

Due to the complexity of these types of projects, the implementation and delivery of a successful BOT project depends on the so-called "Critical Success Factors". By investigating the existing literature, we see that there is not a clear picture regarding the critical success factors of an airport BOT project as most of the examples that are mentioned, are roads and power plants and research on airport projects is limited.

With the guidance of previous researches and existing literature, an initial checklist of all the success factors mentioned was constructed. After an evaluation of the factors, the most important where chosen by considering lessons learned in real projects all over the world. Also, some factors that had similar meaning were gathered in groups.

By reviewing the four articles that were used in Chapter 2, we see that according to their authors, the most important CSFs they found were the following:

Article 1 – Framework for Critical Success Factors of BOT Projects in China - Qiao (2001)

1. Appropriate project identification
2. Stable political and economic situation
3. Attractive financial package
4. Acceptable toll/tariff levels
5. Reasonable risk allocation
6. Suitable subcontractor allocation
7. High level of management control
8. Effective technology transfer

Article 2 – Identification and ranking of critical success factors for BOT projects in India. (Aayushi Gupta 2013)

1. Appropriate risk allocation between government and private sector

2. Short construction period
3. Selection procedure of the concessionaire

Article 3 – CSFs IN COMPETITIVE TENDERING AND NEGOTIATION MODEL FOR BOT PROJECTS (Robert L. K. Tiong, 1995)

1. Entrepreneurship and leadership
2. Right project identification
3. Strength of the consortium
4. Technical solution advantage
5. Financial package differentiation
6. Differentiation in guarantees

Article 4 – Critical Success Factors for Build Operate Transfer (BOT) projects: Lessons learned from airport projects (Mohammad Kashef, 2001)

1. Technical feasibility of the project
2. Stable political and economic situation of the country
3. Availability of adequate government support and guarantee

The most significant factors that were found after conducting my research through the literature review and the questionnaire with specialists from the private sector and the government who are currently involved in Hermes Airports BOT project, are the following:

1. Appropriate project identification
2. Favorable investment environment – stable political and social environment
3. Shared responsibility / commitment between public and private sector

By comparing the above results, we can see that factors that have to do with project identification, and also factors that are related with political environment and economic situation of the country and finally government support, risk allocation between government and private sector are common between the findings in literature review and our research through questionnaires.

Regarding the appropriate project identification factor, the greater identification means higher possibility of a good outcome for both the investors and the government for the success of the BOT project. It is proven that because of the very high cost of these type of infrastructure projects, there has to be an accepted need for the project in order to be successful. The investors have to be able to afford the cost of the project. That means that they will be more interested in the projects that have the largest potential of being more profitable for them, and in the projects

that they are certain they can recoup their investment. Therefore, appropriate project identification is one of the most critical success factors for the outcome of BOT projects.

It is also proven that the political and economic environment greatly affects the success of the BOT project. The political will and the economic stability of the hosting country is vital for the accomplishment of the project. Therefore, it is necessary to carefully review the project at the initial stages taking into account the political and economic situation.

Finally, the concession agreement which is essentially the arrangement between the private investor and the government for the realization of the project. The concession agreement finds the issues which are important for limited recourse financing of projects in the sector of infrastructures like mitigation and unbundling of risk. The BOT sponsors are very sensitive and cautious about identifying the project's risks at a very early stage of its development. After identifying those risks, they have to be allocated between the two parties (the concessionaire and the government). In order to attract private investors with improved efficiencies and reducing cost, which will result in accelerating the growth of the country's infrastructure, a proper concession agreement is necessary. This concession agreement will include guidelines about risk allocation and shared responsibilities and commitment between the private sector. Also, supportive political, legal and commercial environment can be formulated through this agreement. Therefore, the initial concessionaire agreement and effective risk allocation are vital for the success of BOT projects.

CHAPTER 6: RECOMMENDATIONS

The results of this research are helpful for decision makers of BOT projects at initial stages of projects by providing an checklist of CSFs for the success of the project. This will help in better planning and give some guidelines in which factors to consider before initiating a BOT project like the Hermes Airports. As the interviews / questionnaires of this research were mostly with experts which have more experience in the latter phases of the project which is the operating phase, a future review could be conducted with a wider range of people, including people that where involved in earlier stages of the project, like Preliminary Evaluation Phase, Winning BOT Contracts Phase and Construction Phase. This could give us a more accurate image of Airport BOT Projects from their perspective.

REFERENCES

1. Shen L., Lee R.K.H., and Zhang Z. (1996). Application of BOT system for infrastructure projects in China. Journal of Construction Engineering and Management, 122(4): 319–323.
2. Savvides, D. (2016). The Conceptualisation of a Build – Operate – Transfer (BOT) Project
3. Savvides, D. (2015). Build Operate and Transfer (BOT) – The Case of Cyprus Airports.
4. Robert L. K. Tiong (1992). Critical Success Factors in Winning BOT Contracts.
5. Aayushi Gupta(2013). Identification and ranking of critical success factors for BOT projects in India
6. Xueqing ZHANG (2005), Critical success factors for public private partnerships in infrastructure development
7. Robert L.K. Tiong (1996), CSFs in Competitive Tendering and Negotiation Model for BOT Projects
8. Tony Merna, Raghvendra Dubey (1998) Financial Engineering in the Procurement of Projects
9. Robert L.K. Tiong (1996), Final Negotiation in Competitive BOT Tender
10. Chan, A.P.C. , Lam, P.T.I. , Chan, D.W.M. , Cheung, E. and Ke, Y. (2010), "Critical success factors for PPPs in infrastructure developments: Chinese perspective"
11. Merna, A. and Dubey, R. (1998), Financial Engineering in the Procurementof Projects
12. Tiong, L. K. R., Yeo. K. M.. and McCarthy, S. C. (1992). "Critical Successfactors in winning BOT contracts." J. Constr. Engrg. andMgmt., ASCE, New York, N.Y.
13. Li B., Akintoye A., Edwards P. J., Hardcastle C., 2005. "Critical Success Factors for PPP/PFI Projects in the UK Construction Industry", Construction Management and Economics, Vol. 23, pp. 459–471.
14. Qiao L., Wang S. Q., Tiong R. L. K., Chan T. S., 2001. "Framework for Critical Success Factors of BOT Projects in China", The Journal of Project Finance, pp. 53-61.
15. Li B., Akintoye A., Edwards P. J., Hardcastle C., 2005. "Critical Success Factors for PPP/PFI Projects in the UK Construction Industry", Construction Management and Economics, Vol. 23, pp. 459–471.
16. Li B., Akintoye A., Edwards P. J., Hardcastle C., 2005. "Critical Success Factors for PPP/PFI Projects in the UK Construction Industry", Construction Management and Economics, Vol. 23, pp. 459–471.
17. Qiao L., Wang S. Q., Tiong R. L. K., Chan T. S., 2001. "Framework for Critical Success Factors of BOT Projects in China", The Journal of Project Finance, pp. 53-61.
18. Li B., Akintoye A., Edwards P. J., Hardcastle C., 2005. "Critical Success Factors for PPP/PFI Projects in the UK Construction Industry", Construction Management and Economics, Vol. 23, pp. 459–471.
19. Samii, R., Van Wassenhove, L.N., Bhattacharya, S., 2002. "An Innovative Public Private Partnership: New Approach to Development", World Development, Vol. 30 No.6, pp.991-1008.

20. hang, W.R., Wang, S.Q., Tiong, R.L.K., Ting, S.K. and Ashley, D., 1998. “Risk Management of Shanghai’s Privately Financed Yan’an Donglu Tunnels”, Engineering, Construction and Architectural Management, 5(4), pp. 399-409.
21. Akintoye, A., Beck, M., Hardcastle, C., Chinyio, E., Asenova, D., 2001b, “The Financial Structure of Private Finance Initiative Projects”, Proceedings of the 17th ARCOM Annual Conference, Salford University, Manchester, 1, 361–369.
22. ATM Dalaman Airport – Home Page, ATM Dalaman Airport, http://www.atmairport.aero, 20th of June 2011.
23. Badshah, A., 1998. “Good Governance for Environmental Sustainability, Public Private Partnerships for the Urban Environment Programme (PPPUE)”, United Nations Development Program, UNDP, New York.
24. Bennett, E., 1998. “Public–Private Co-operation in the Delivery of Urban Infrastructure Services (Water and Waste)”, Background paper: “Public Private Partnerships for the Urban Environment Programme (PPPUE)”, UNDP/Yale Collaborative Programme, United Nations Development Programme, New York.
25. Birnie, J., 1999. “Private Finance Initiative (PFI) – UK Construction Industry Response”, Journal of Construction procurement, 5(1), pp. 5–14.
26. Black Rabbit, South Coast of Turkey – The city of Dalaman in Turkey,http://southcoastofTurkey.com/dalaman-Turkey.shtml, 20th of June 2011.
27. Boyfield, K., 1992. “Private Sector Funding of Public Sector Infrastructure”, Public Money and Management, 12(2), pp. 41–46.
28. Brodie, M.J., 1995. “Public/Private Joint Ventures: The Government as Partner – Bane or Benefit?”, Real Estate Issues, 20(2), pp. 33–39.
29. Dailami, M., Klein, M., 1997. “Government Support to Private Infrastructure Projects in Emerging Markets, in Irwin”, T. (ed.), World Bank Latin American and Caribbean Studies Viewpoints: Dealing with Public Risk in Private Infrastructure, World Bank, Washington, pp. 21–42.
30. Dikmen I., Birgönül M. T., Atasoy G., 2008. “Policy, Finance & Management for Public–Private Partnerships”, Chapter 19: Best Value Procurement in Build Operate Transfer Projects: The Turkish Experience, Wiley – Blackwell, pp. 363-378.
31. Euromoney Country Risk – Home Page, Euromoney Institutional Investor, http://www.euromoneycountryrisk.com/, 10th of August 2011.
32. European Investment Bank, 2000. “The European Investment Bank and Public Private Partnerships”, Newsletter of the International Project Finance Association, 1, pp. 3–4.
33. Frilet, M., 1997. “Some Universal Issues in BOT Projects for Public Infrastructure”, International Construction Law Review, 14(4), pp. 499–512.
34. Gatti S., 2007. “Project Finance in Theory and Practice”, Academic Press, pp. 414 - 420.
35. Gentry, B., Fernandez, L., 1997. “Evolving Public–Private Partnerships: General Themes and Urban Water Examples”, Proceedings of the OECD Workshop on Globalisation and the Environment: Perspectives from OECD and Dynamic Non-Member Economies, Paris, 13–14 November, pp. 19–25.

36. Gidman, P., Blore, I., Lorentzen, J., Schuttenbelt, P., 1995. “Public Private Partnerships in Urban Infrastructure Services”, UNDP/Habitat/World Bank, Nairobi, UMP Working Paper Series No. 4, pp.1-11.
37. Grant, T., 1996. “Keys to Successful Public–Private Partnerships”, Canadian Business Review, 23(3), pp. 27–28.
38. Hagen, R., 2002. “Globalization, University Transformation and Economic Regeneration: A UK Case Study of Public/Private Sector Partnership”, The International Journal of Public Sector Management, Vol. 15 No.3, pp. 204-18.
39. Hambros, SG., 1999. “Public–Private Partnerships for Highways: Experience, Structure, Financing, Applicability and Comparative Assessment”, Hambros SG, Canada.
40. Hemani A., 2006. “Build, Operate, Transfer The New Mantra in Outsourcing”, Omintech Infosolutions.
41. Jamali D., Olayan S. S., 2004. “Success and Failure Mechanisms of Public Private Partnerships (PPPs) in Developing Countries”,
42. International Journal of Public Sector Management, Vol. 17, pp. 414-430.
43. Jefferies, M., Gameson, R., Rowlinson, S., 2002. “Critical Success Factors of the BOOT Procurement System: Reflection From the Stadium Australia Case Study”, Engineering, Construction and Architectural Management, pp. 352–361.
44. Jones, I., Zamani, H., Reehal, R., 1996. “Financing Models for New Transport Infrastructure”, OPEC, Luxembourg.
45. Kanter, R.M., 1994. “Collaborative Advantage: The Art of Alliances”, Harvard Business Review, No. July-August, pp. 96-108.
46. Kanter, R.M., 1999. “From Spare Change to Real Change”, Harvard Business Review, 77(2), pp. 122–132.
47. Kopp, J.C., 1997. “Private Capital for Public Works: Designing the Next-Generation Franchise for Public–Private Partnerships in Transportation Infrastructure”, Unpublished Master’s thesis, Department of Civil Engineering, Northwestern University, USA.
48. Li B., Akintoye A., Edwards P. J., Hardcastle C., 2005. “Critical Success Factors for PPP/PFI Projects in the UK Construction Industry”, Construction Management and Economics, Vol. 23, pp. 459–471.
49. McCarthy, S.C., Tiong, R. L. K., 1991. “Financial and Contractual Aspects of Build–Operate–Transfer Projects”, International Journal of Project Management, 9(4), pp. 222–227.
50. Merna, A., Smith, N.J., 1999. “Privately Financed Infrastructure in the 21st Century”, Proceedings of the Institution of Civil Engineers – Civil Engineering, 132, pp. 166–173.
51. National Audit Office (NAO), 1999. “Examining the Value for Money of Deals under the Private Finance Initiative”, NAO, London.
52. National Audit Office (NAO), 2001b. “Managing the Relationship to Secure a Successful Partnership in PFI Projects”, NAO, London.
53. Nourzad, S. H. H., 2009. “Evaluation of Risk Effects on Financial Indicators in Infrastructural Projects”, Unpublished MBA Thesis, Technical Department, University of Tehran.

54. Pongsiri, N., 2002. “Regulation and Public Private Partnerships”, The International Journal of Public Sector Management, Vol. 15 No. 6, pp.487-495.
55. Qiao L., Wang S. Q., Tiong R. L. K., Chan T. S., 2001. “Framework for Critical Success Factors of BOT Projects in China”, The Journal of Project Finance, pp. 53-61.
56. Rockart, J.F., 1982. “The Changing Role of the Information Systems Executive: a Critical Success Factors Perspective”, Sloan Management Review, 24(1), pp. 3–13.
57. Samii, R., Van Wassenhove, L.N., Bhattacharya, S., 2002. “An Innovative Public Private Partnership: New Approach to Development”, World Development, Vol. 30 No.6, pp.991-1008.
58. Schaufelberger J. E., 2005. “Risk Management on Build-Operate-Transfer Projects, Construction Research Congress, Paper 7547.
59. Stein, S.W., 1995. “Construction Financing and BOT Projects”, International Business Lawyer, 23(4), pp. 173–180.
60. Stonehouse, J.H., Hudson, A.R., O’Keefe, M.J., 1996. “Private–Public Partnerships: The Toronto Hospital Experience”, Canadian Business Review, 23(2), pp. 17–20.
61. The World Bank, Kazakhstan – Country Brief 2010, http://www.worldbank.org.kz, 20th of June 2011.
62. Tiong R. L. K., 1990. “BOT Projects: Risks and Securities”, Construction Management and Economics, 8, pp. 315-328.
63. Tiong R. L. K., 1990. “Comparative Study of BOT Projects”, Journal of Management in Engineering, Vol. 6, No. 1, pp. 107-122.
64. Tiong R. L. K., 1995. “Risks and Guarantees in BOT Tender” Journal of Construction Engineering and Management, pp. 183-188.
65. Tiong R. L. K., 1996. “CSFs in Competitive Tendering and Negotiation Model for BOT Projects”, Journal of Construction Engineering and Management, pp. 205-211.
66. Zantke, G., Mangels, B., 1999. “Public Sector Client – Private Sector Project: Transferring the State Construction Administration into Private Hands”, Engineering, Construction and Architectural Management, 6(1), pp. 78–87.
67. Zhang, W.R., Wang, S.Q., Tiong, R.L.K., Ting, S.K. and Ashley, D., 1998. “Risk Management of Shanghai’s Privately Financed Yan’an Donglu Tunnels”, Engineering, Construction and Architectural Management, 5(4), pp. 399-409.
68. Zhao Z., Zuo J., Zillante G., Wang X., 2010. “Critical Success Factors for BOT Electric Power Projects in China: Thermal Power versus Wind Power”, Renewable Energy, pp. 1283–129.