A Case Study: With Public&Private Sector Perceptions, New İstanbul Airport Through PPP

Emrah DURMAZ
Department of Aviation Management,
Anadolu University, Faculty of Aeronautics and Astronautics
Eskişehir, Turkey
emrahdurmaz@anadolu.edu.tr

Ünal BATTAL
Department of Aviation Management,
Anadolu University, Faculty of Aeronautics and Astronautics
Eskişehir, Turkey
ubattal@anadolu.edu.tr

***Abstract*— Air transportation includes a lot of uncertainty for all shareholders of industry such as airlines, fuel suppliers, air traffic, airport operators. To address this, some research focused on reel option as a right investment evaluation tool by highlighting the importance of flexibility against uncertainty. Reel options as an investment evaluation tool helps decision makers to evaluate investment within the contexts of flexibility. As previous studies indicated, considering airport investments as massive infrastructure projects and including too much uncertainty, it is rational to plan these investments with options those which could conserve project against uncertainties and evaluate through the instrument of real option (RO). Yet public and private sector interests on options in public-private partnership projects (PPP) has never been examined. Motivated by this absence this paper focuses on the public and private sector interests on options in airport infrastructure project. We purpose the investigate; perception and motivation source of private sector involvement in PPPs and importance rate of options for both public and private sector perceptions by taking New Istanbul Airport (NİA) as a case study which planed modularly and has passenger grantee by government those which can be seen as options.**

Keywords-component; airport financing; public-private-partnerships; real option

I. INTRODUCTION

It has been long discussed that commercial air transport industry, within the all shareholders, suffers the uncertainties arising out of the global economic crisis or other particular events such as regional political crisis, fuel crisis, terrorist attacks. All shareholders struggle and handle these uncertainties by managerial flexibility.

Most recent world financial crisis flagged up that in some cases, even with the perfect planning ability, future is not to predict but manage. In other words of Robert C. Merton: 'the future is uncertain... and in an uncertain environment, having the flexibility to decide what to do after some of that uncertainty is resolved definitely has value' [1]. RO theory based on the aspect of evaluation of this flexibility and adding the value of projects by incorporating the value of flexibility. These conditions are perfectly address the real option as a solution.

Options have been used and analyzed with vary way in air transportation such in the field of fleet planning and aircraft acquisition investments [2], capacity transfer, price optimization [3] and over booking [4]. These are the individual option that companies desired and had through their investments. Yet Airport infrastructure projects through PPP include two part: public sector and private sector. Whereas governments desire the private sector involvement to these infrastructure project to represent adequate performance of infrastructure performance for both economic and social benefits, private sector inherently chases for relatively low risk and high rate of return [6].

An earlier study [5] analyzed New Lisbon Airport and evaluated within the context of RO. Afterwards another study [6] examined and evaluated the New Lisbon Airport with the flexible and inflexible scenarios by using RO analysis. Despite initial study [5] made before 2008 Global Financial Crisis, both study [5; 6] found that practicing massive infrastructure project, under uncertainty environment, with options results with more project value since it adds flexibility. At this point including option to these massive infrastructure projects has been carried out yet never been analyzed within the context of public and private sector perception towards options.

This paper organized as follows: Section II explains the importance of ROs and introduce mainstays of ROs; Section III represent NIA Project to understand purposed approach. Finally, Section IV describes the given conclusions and future study.

II. IMPORTANCE OF REAL OPTİON

Since Black and Scholes and Merton represented their study, financial option pricing has found new areas of applications. The theory is also applicable to evaluate option within real assets. An important hue that differs between real and financial options is the underlying asset. Financial options, the value of the underlying asset can be easily seen in financial markets but in the case of ROs whose value depends on revenues or real assets, it is much harder to observe and gather data [7].

RO is, recently, a growing valuation tool for infrastructure investments. Their growth in the last two decades meets the needs of new methods to evaluate projects value since discounted cash flow (DCF) techniques does not allow capturing the value of flexibility [6; 7] Airport infrastructure projects contain high rate of risk from design to end due to high need of capital and uncertainties [5; 6]. RO offers great deal of advantage when the managerial flexibility and rate of uncertainty high [7]. As it can be seen at figure 1, capturing that king of massive infrastructure projects with option can be useful for both side of PPP to finalize the projects thanks to increased flexibility and project value.

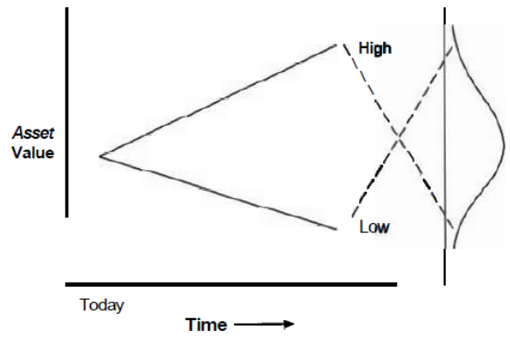

Figure 1. Cone of uncertainty [7]

Yet massive infrastructure projects with real options can not be evaluate with DCF methods since these methods only take into account of cash flown of investment not the flexibility it contains [7; 8]. As it mentioned, RO is suitable valuation tool for airport infrastructure investment through PPP.

Considering that private sector interest is desired by public sector, it is rational to design and contract projects containing options which could give the private sector partner enough flexibility and more project value. As it is every part of the business, we can expect that completion at contract stage of PPPs would have positive affect on social and economic benefits of project.

III. AİRPORT INVESTMENT THROUGH PPP AND NIA

Turkey has experienced great deal of traffic grown for the last decade. Istanbul is one of the 15 largest cities of the world, with its 14.7 million young and educated population. Welcoming 80.5 million passengers out of the 166 million passenger traffic of Turkey in 2014, Istanbul is one of the most productive hubs of a vast territory covering Europe, the Middle East and North Africa.

Located in İstanbul's European Side, the largest airport of Turkey, Atatürk Airport has offered services to national and international aviation since 1953, for 60 years. The Turkish civil aviation has advanced rapidly in the recent years, both in quality and quantity. Atatürk Airport has become Europe and the world's leading airports and transfer hubs. Since this airport is one of the most strategically important facilities of Turkish civil aviation, various projects have been carried out via both public resources and public-private sector cooperation models.

Turkey already has considerable experience in implementing a wide range of infrastructure PPPs and is keen to realize further projects in energy, health, transportation and other public services. As of September 2014, the Turkish PPP market reached a total of 183 projects with a contract value of US$102bn. Of these, Airport PPP projects amount to US$56bn or 55 per cent of the total spread over 18 airport projects. Airport PPPs have involved developing new airports with the build-transfer-operate (BOT) model, as well as transferring the operation rights (TOR) of existing ones [9]. Yet as foreseen for several decades, the capacity of the existing İstanbul Atatürk Airport has been exceeded. Moreover, it is impossible to expand the capacity of it due to urban development in the surrounding areas, so need for new airport was inevitable.

NIA project is made up of four construction stages. The tender has been carried out in a different way than with previous projects Turkey experienced. Instead of operation life options, rent prices (for a specific duration of operation) competed at the tender. Operation life of this project has been determined as 25 years, which includes the first stage (42 months) for construction works followed by the launch of the airport until the end of 25 years. NIA project involves four stages in total. [10] Table 1. Shows the stage of project. As it can be seen at the table when all stages are completed, the airport would handle around 450 aircraft at the same time. By all stages is finished, NIA will be the biggest airport in Europe and one of the top three in world by passenger capacity.

TABLE 1. CONSTRACTİON STAGES OF NIA

	Stage 1	***Stage 2***	***Stage 3***	***Stage 4***
Runway	3	4	5	6
ATC Tower	2	2	2	3
Terminal building	Terminal 1	Terminal 1	Terminal 1 Terminal 2	Terminal 1 Terminal 2 Satellite
Aircraft bridge	109	109	146	181
Aircraft parking area	158	158	230	271

The open bidding for İstanbul New Airport was carried out in the presence of predetermined bidders, the press and notary representatives. In return for 25 years of operation life and issue of 10 billion 247 million euros investment on the understanding that the first stage will be completed in 42 months at the latest; Limak İnş. San. ve Tic. A.Ş./Kolin İnş.Tur.San. ve Tic. A.Ş./Cengiz İnş.San. ve Tic. A.Ş./Mapa İnş. ve Tic. A.Ş./Kalyon İnş. San. Tic. A.Ş. Joint Venture bid the highest amount renting value: 22 billion 152 million euros plus value added tax (VAT) which is the highest amount of Turkey among PPPs [10].

Özdemir, chairperson of Limak Group, the winner of NIA Tender, state that: airport PPPs have become more attractive for both Public and private partners. For governments: PPPs can reduce the pressure on government finances in the face of airports with substantial investment needs; the risks and responsibilities of airport operations can be transferred to the private sector; the lifespan of airport systems can be maximized; available airport land resources and existing facilities can be transferred to the private sector; the lifespan of airport systems can be maximized; available airport land resources and existing facilities can be optimized. For private sector investors: growth in passenger traffic creates a potential for increased revenues and improved margins due to economies returns. She also indicate appropriate risk allocation as one of seven main factor for successful PPPs. The main rationale for using a PPP model rests on the proposition that optimal risk sharing with the private sector delivers better value for money. Therefore, each risk should be assumed by the party that is best able to manage it [9].

IV. FUTURE STUDY

This paper describes the PPPs with real option and summarize the NIA processes including planning, tender up to now. As mentioned in the comment of Özdemir, contractor company values the managerial flexibility. NIA will be evaluated with RO approach with the existing Atatürk Airport's data and future forecasts and result will be shared with all consortiums participate in tender, General Directorate of State Airports Authority (DHMİ) and during the focus group meeting. We hope to understand not only the public sector perception but also private sector perception towards option and investigate if they used real option as a evaluation tool.

REFERENCES

[1] R.C. Merton, ''Applications of Option-Pricing Theory: Twenty-Five Years Later,'' American Economic Review. vol. 88, pp: 323–349, June 1998

[2] Q. Hu and A. Zhang, ''Real option analysis of aircraft acquisition: A case study,'' Journal of Air Transport Management. vol. 46, pp:19-29, April 2015

[3] M. Graft, A. Kimms, ''Transfer price optimization for option-based airline alliance'' Int. J.Production Economics vol. 145, pp.: 281-293,May 2013

[4] X. Wang and R. Y.K. Fung, ''An option-based hedging mechanism for managing the risk of overbooking in parallel airline alliances,'' Transportation Research. Part. E, pp: 146-152, June 2014

[5] R. D. Chambers, ''Tackling Uncertainty in Airport Design: A Real Options Approach'' Massachusetts Institute of Technology, Augost 2007

[6] J. Martins, R. C. Marques and C. O. Cruz, "Maximizing the value for money of PPP arrangements through flexibility: An application to airportsJournal of Air Transport Management, vol. 3, pp. 720–80, May 2014

[7] P. Kodukula and C. Paudesu, ''Project Valuation Using Real Options A Practitioner's Guide,'' J. Ross Publishing, Inc. Floridai USA, 2006 .

[8] J. Mun, ''Real Options Analysis: Tools and Techniques for Valuing Strategic Investments and Decisions,'' John Wiley & Sons, Inc., New Jersey, 2002

[9] E. Özdemir, ''Experience in structuring public-private partnershipsfor airports,'' Airport Management. Vol. 9, pp:154-161, January, 2015

[10] [2] Turkey General Directorate of State Airports Authority [DHMI], Uçuş Noktası, January 2014