CRITICAL SUCCESS FACTORS FOR PUBLIC PRIVATE PARTNERSHIP PROJECTS IN THE TURKISH CONSTRUCTION INDUSTRY

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Submitted to the Institute for Graduate Studies in

Science and Engineering in partial fulfillment of

the requirements for the degree of

Master of Science

Graduate Program in Civil Engineering

Boğaziçi University

2014

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DATE OF APPROVAL: 03.04.2014

ACKNOWLEDGEMENTS

I would like to express my gratitude to all people, who in one way or another contributed to the development of this research. I would like to express my sincere appreciation to my advisor Assoc. Prof. Beliz Özorhon Orakçal; thank you for your valuable help in instructing, guiding and supporting me throughout the duration of this thesis.

Also, I would like to thank the members of my Master's thesis examination committee: Assist. Prof. Ilgın Gökaşar, and Assoc. Prof. S. Ümit Dikmen for all their valuable comments and advice.

Finally, I would like to thank my precious family members and friends; I dedicate this thesis to them for their support and encouragement during each phase of my academic career.

ABSTRACT

CRITICAL SUCCESS FACTORS FOR PUBLIC PRIVATE PARTNERSHIP PROJECTS IN THE TURKISH CONSTRUCTION INDUSTRY

Public Private Partnership (PPP) has become in both developed and developing countries as an essential procurement method in delivering public services. PPPs could be classified in five main models as service contract partnerships, leasing contracts, public private joint ventures, concession contracts, and privatization. In the construction industry, concession contracting, the private sector is responsible for designing, building, financing and operating a public entity. The study is investigating the critical success factors (CSFs) of PPPs in the procurement of public projects. It defines the factors that make contribution to the successfully delivery of the capital projects. A questionnaire survey is designed and administered to both public and private sector participants. The questionnaire consists of three parts; the first two parts deal with the general information and CSFs and third part with project specific questions. Eighty-two respondents provided valid responses out of 365 sent survey form. Based on the collected data, the relative importance of 23 potential CSFs for PPP construction projects in Turkey is examined. The results show that the three most important factors are: 'favorable legal framework', 'detailed/clear project identification' and 'extensive, reasonable cost-benefit assessment'. Factor analysis indicated that proper factor groupings for the 23 CSFs are: project finance, project management, operational factors, procurement and organizational factors. These findings may influence the public entities/Turkish government to solve some legal and bureaucratic issues that enable to make PPP projects more attractive for contractors and financiers. As a consequence, public sector can completely focus on unprofitable public services and public investments, which cannot be done due to the limited funding, can be performed immediately by private sector. From the private sector aspect, construction companies can expand business areas in this way, gain new experiences. Moreover, analysis results may provide contractors insight about their weak and strong points thus what steps should be taken.

ÖZET

TÜRK İNŞAAT SEKTÖRÜNDE KAMU-ÖZEL İŞBİRLİĞİ (KÖİ) PROJELERİ İÇİN KRİTİK BAŞARI FAKTÖRLERİ

Kamu Özel Ortaklığı (KÖİ), kamu hizmetlerinin sağlanmasında önemli bir tedarik yöntemi olarak hem gelişmiş hem de gelişmekte olan ülkelerde gelişmiştir. KÖİler hizmet sözleşmesi ortaklıkları, finansal kiralama sözleşmeleri, kamu özel ortak girişimleri, imtiyaz sözleşmeleri ve özelleştirme olmak üzere beş ana modelde sınıflandırılabilir. İnşaat sektörü imtiyaz sözleşmelerinde, özel sektör yapı tasarımı , finansmanı ve kamu varlıklarının işletilmesinden sorumludur. Çalışma kamu projelerinin temininde KÖİ projelerin başarıyla tamamlanmasına katkıda bulunan kritik başarı faktörlerini (KBF) belirlemeyi amaçlamaktadır. Bu sebeple hem özel sektör hem de kamu katılımcılarına yönelik bir anket formu tasarlanmıştır. Anket üç bölümden oluşmaktadır; ilk iki bölüm genel bilgiler ve KBF'ler, üçüncü bölümü ise projeye özel sorular içermektedir. Gönderilen 365 anketten seksen iki tanesine geçerli yanıt verilmiştir. Toplanan verilere dayanarak, Türkiye'deki KÖİ inşaat projeleri için 23 potansiyel KBF'lerin bağıl önemi incelenmiştir. Sonuçlar en önemli üç faktörün 'uygun yasal çerçeve', 'ayrıntılı/anlaşılır proje tanımlama' ve 'kapsamlı, akılcı maliyet-fayda analizi' olduğunu göstermektedir. faktör analizi 23 KBF için uygun grup başlıklarının: proje finansmanı, proje yönetimi, operasyonel faktörler, satın alma ve örgütsel faktörler olduğunu göstermiştir. Bu bulgular, bazı yasal ve bürokratik problemleri çözerek KÖİ projelerini müteahhitler ve finansörler için daha cazip hale getirmesi için kamu kurumlarını/Türk hükümetini etkileyebilir. Böylece, kamu sektörü tamamen kar getirmeyen kamu hizmetlerine yoğunlaşır ve kaynakların sınırlı olmasından dolayı gerçekleştiremediği kamu yatırımlarını özel sektör kısa sürede gerçekleştirebilir. Özel sektör açısından, bu yolla iş alanlarını genişletebilir ve yeni tecrübeler edinebilir. Ayrıca, analiz sonuçları müteahhitlere güçlü ve zayıf oldukları noktalar hakkında fikir vererek gerekli adımları atmalarını sağlayabilir.

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LIST OF ACRONYMS / ABBREVIATIONS

BBO	Buy-Build-Operate
BL	Build-Lease
BLT	Build-Lease-Transfer
BO	Build-Operate
BOO	Build-Own-Operate
BOT	Build-Operate-Transfer
BTO	Build-Transfer –Operate
CM	Construction Manager
CP	Capital Projects
CPI	Capital Project Industry
CSF	Critical Success Factor
DBFO	Design-Build-Finance-Operate
DCMF	Design-Construct-Manage-Finance
HPC	High Planning Council
KMO	Kaiser-Meyer-Olkin Measure
KSF	Key Success Factors
LDO	Lease-Design-Operate
MSA	Measures of Sampling Adequacy
PFI	Project Finance Initiatives
PPP	Public Private Partnership
PSI	Private Sector Initiatives
PSP	Public Sector Project
SAA	State Airports Authority
SPO	State Planning Organization

SPV	Special Purpose Vehicle
TEK	Turkish Electricity Authority
TOR	Transfer of Operating Rights
VFM	Value for Money

1. INTRODUCTION

1.1. Background

Since the end of World War II, economic development has gained considerable importance worldwide. Changes in the socio-economic structure over the past several decades have led governments shift toward new economic development methods. Policy makers at various positions in government realized that greater economic development could be reached by taking more active role in attracting investment. PPP philosophy is based on the corporation of the public and private sectors which aims to create new value and benefit for all related parties. The traditional approach of procuring projects allocates the roles for the public and private sectors while PPP combines the public and private parties (Amponsah, 2010).

Shen *et al.* (2006) has defined Public sector project (PSP) as a broad mention that can be applied to wide range of public works and generally it covers most of the construction projects in a country.

Even though involvement of the private sector in the development and financing of public services has increased recently, private sector participation in financing and undertaking public projects is not a new phenomenon. Walker and Smith (1995) and Winch (2000) pointed out that at the beginning of the rails and canals, investors and contractors established their developments and started to fund for them suspiciously.

In the 19th century, under traditional procurement method where the government played a leading role the lowest price was basically used in appropriate contractor selection and value assessment. The growth in the professional system seeking to protect the interest of the client came with this. As a result, as cited by Winch (2000), was that as clients tried to push down their production costs, they saw their transaction costs rising in the form of fees to professionals. This understanding is not only limiting the contractors' innovation ability but also promoting inefficiency and negatively affecting the growth in the industry (Egan, 1998; Latham, 1994; Ward, 1998). After the second half of 1900s the idea had

started to alter in public project procurement for best practices. Searching for best practices caused innovative procurement strategies as selective rather than open competitive bidding, management contracting, package deals, and design-build. The search for new approaches in procurement of capital projects caused Public-Private Partnerships to become popular in the public sector which has the largest capital project spending (Amponsah, 2010).

Although the PPP approach application has increased significantly in the late 1990s, the roots of private investment in the development and financing of public facilities and services go back to the 18th century in European countries. The best-known example is the concession contract that supplied drinking water to Paris. In the 19th century, more alike examples were added from European, American and Asian countries (e.g., the Suez Canal and Trans-Siberian Railway, as well as canals, turnpikes, and railroads in Europe) (Kumaraswamy and Morris, 2002).

Public-Private Partnership (PPP) approaches that vary simple contracting-out of services to the contribution of the private sector in the financing, design, construction, operation, maintenance and, in some cases, concessional ownership of major facilities continue building up in order to guide the public and private sectors to share the risks and rewards together.

That tendency has started to provide more efficiency in the procurement of capital projects and get more value for money as a result this trend has brought out many initiatives which are the one of the Public-Private-Partnership concept. The concept launched in 1992 aimed at using private sector capital and efficiency gains by sharing risks with the party best able to manage them optimally. Amponsah (2010) cited that supporters of the concept think that risk must be transferred to private sector to assist primary principle that the project must provide value-for-money to the taxpayer.

There are many factors promoting the PPP trend. Generally today public sector has difficulties because of scarcity in funding public investments such as large-scale and capital intensive infrastructure and building projects as a consequence a bottleneck comes out in the economic growth. Furthermore, PPP allows the public sector to transfer risks to

the private sector regarding the project implementation and opens up a new market and likely offers relatively high returns to the private sector in the private sector's side at the same time (Nielsen, 1997; Langdon and Everest, 2001).

The reasons for adopting PPP are different in developed and developing countries. Harding (1998) stated that in developed countries, governments are willing to improve national economic competitiveness through tight monetary policy, public expenditure cuts, significant scaling-down of the size and functions of the public sector, an increscent involvement of private sector in delivering public and quasi-public goods, and a commitment to liberate the entrepreneurial spirit, while in developing countries economy is not strong and most of them is dependent to the foreign capital and suffer from poverty and health problems thus governments have to create a co-operative environment, either by tax grants or guarantees (Zagha, 2000). In order to strengthen competitiveness and export in some of new industrial areas, a partnership between government and private sector was established (Liu, 2000).

Defining the phrase PPP is really hard due to diversity of PPP projects and models. In some cases local governments have authority to issue tax concession for jobs promising partnership in the future. A partnership has different variations in a range of privatizing the facilities to simply applying financing or management techniques (McDonought, 1998). This idea succeeded in the early days of PPP (The World Bank and the International Finance Corporation, 1992). Therefore according to Ford and Zussman (1997), the terms "privatization", public private partnerships, alternative service delivery and municipal service partnerships were used to mean the same thing.

Plenty of factors have been defined as assisting the successful delivery of public projects (Chua *et al.*, 1999) and Morledge and Owen (1998) have pointed out that determining those key components which may directly affect the profitable conclusion for the stakeholders if applied to the public projects is crucial. This study is aiming to explore the CSFs that can provide successful procurement associated with construction PPP projects in Turkey to bridge this knowledge gap. For a successful project, strategic steps should be taken in the early stages of the project and the findings of this research can give

an idea to organizations in the construction industry by identifying which factors are critical in terms of their perceived importance (Li *et al.*, 2005).

1.2. Statement of Problem

PPP differs from traditional public services/goods provision in many ways. The design, construction, operation and finance responsibility of a capital project belongs to a single contractor or consortium. PPP contains various responsibilities and risks related to the procurement and operation of a capital asset being transferred to the private sector.

NS (1997, cited in Li *et al.*, 2005) and BM (1995, cited in Li *et al.*, 2005) claimed that PPP can bring multiple benefits to the public sector, private sector and the end-users. The taxpayers can obtain more, and better, public projects services. For the public sector, the benefits include improved project value for money, transfer risks to the private sector, with a long term commitment to a defined quality of service, closer integration of service construction, mobilization of additional finance, and "off balance treatment". For the private sector, there are new market opportunities in technology and management innovation, and long-term markets in both domestic and overseas (Bimie, 1999; lPPR, 2001).

Despite the increase in PPP applications in Turkey, there are still many dark spots in a large number of PPP areas which are not clear to each party involved. In the construction PPP projects, a definite understanding of the new procurement arrangement is also required. For this purpose, this study focuses on an overview of PPP within Turkey, particularly in the area: Critical success factors (CSFs).

Sagalyn (2007) contended that existing Public Private Partnership (PPP) projects have three generations. In the first step, mistakes easily come out because of inexperienced public and private partners and their consultants. In the second generation, specific PPP urban development projects were developed by large development companies, often by employing planners who managed PPP projects for public entities or led PPP corporations. In consequence of social development, the third generation has appeared which PPP projects commenced by developers searching for private-sector involvement. In this phase

the number of PP projects is expanding and it is expected that they will be used more commonly in public service, city reconstruction, and so forth (Tang *et al.*, 2010).

Since several forms of PPP projects are experienced in different countries which have varied situations, PPP has very diverse definitions. In the UK, the United Nations Development Program (2007) stated that the definition of the PPP should be broad such that even the informal dialogues between government officials and local community-based organizations, which are perceived to be essential to successful PPPs. As cited by Li and Akintoye (2003) and United Nations Development Program (2005) the National Council for Public Private Partnership, in the US, defined a PPP as a "contractual arrangement between a public sector agency and a for-profit private sector developer, whereby resources and risks are shared for the purpose of delivery of a public service or development of public infrastructure". In Canada, the Council for Public Private Partnerships (2004) defines a PPP as a "cooperative venture between the public and private sectors, built on the expertise of each partner, which best meets clearly defined public needs through the appropriate allocation of resources, risks and rewards".

Another definition has been developed by Efficiency Unit (EU) in Hong Kong and created a new focus on private-sector involvement (PSI) to "assist the government in meeting its priorities, building on the clear recognition that public funds are limited" (Tang *et al.*, 2010).

Eaton *et al.* (2007) stated that due to the expansion of PFI/PPP in all over the world as a procurement method, the evaluation of the cultural differences between nations may help in minimizing the potential difficulties of applying PPP within different cultural and social "systems".

The whole concept of PPP is based on a government will to figure out financial restrictions in the procurement of public facilities and services by taking advantage of management skills of private sector to increase the efficiency, effectiveness and quality of facilities and services delivery (HM Treasury, 2000). Li *et al.* (2005) claimed that the level of private sector involvement might range from simple service provision without recourse to public facilities, through service provision based on public facilities usage, up to and

including full private ownership of public facilities and operation of their associated services.

Previous studies on problems that relate PPP procurement have showed issues such as: high cost in tendering, complex negotiation, cost restraints on innovation, and differing or conflicting objectives among the project stakeholders. Despite this, many PPP projects are regarded as successful. Many studies have developed different lists of Success Factors (SF) for PPP projects, but similarities occur among them (Hardcastle *et al.*, 2004); on the other hand, less information exists about the relative importance of CSF associated with PPP projects in many nations. Since different types of PPPs are implemented in various countries in infrastructure development, diverse results and a variety of problems are being encountered consequently. Despite many remarkable researches were conducted on this subject and despite plenty of writings about PPP procurement of public projects, and despite decades of individual and collective experience on managing PPP projects, project results continue to disappoint stakeholders. A research that has focused on identifying critical success factors for procurement of projects is needed.

1.3. Aim and Objectives

The study aims to identify the critical factors that can successfully facilitate procurement of the PPP projects. The objective of the study is to identify the Critical Success Factors (CSFs) thus willing to make contributions to knowledge for methodologies used for procurement and development of PPP projects by strengthening the theoretical understanding in the construction industry.

The research findings can help a wide range of individuals, from people concerned with the state of the public services and to those involved in public spending whose duty is to monitoring the delivery of public projects.

A search for proper strategies for successful delivery of procurement and implementation of capital projects (Confederation of British Industry, 1996; Private Finance Panel, 1996) is needed. The number of Public-Private Partnerships (PPP) applications is expanding in the delivery of public services and other privatization projects

as a procurement strategy all over the world. Numbers of factors have been observed as contributors of the success or failure of capital projects in terms of their objectives. This research examines the critical factors that can help for a successful procurement and implementation of capital projects by developing, administering and analyzing results of the PPP survey. The findings can influence the government's attitude toward PPPs and the way where those involved can go about developing Public-Private Partnerships.

This research aims to identify factors critical to PPPs in construction projects to produce a guideline. To achieve this aim, a series of steps will be taken as follows:

- To explain the mechanism of PPP evolution.
- To explain current PPP models within the construction industry in Turkey.
- To make search for potential critical success factors.
- To establish critical success factors (CSFs) for construction PPPs.

1.4. Research Methodology

1.4.1. Research Procedure

The overall research program is divided into two phases, as shown in Figure 1.1. The first phase is literature review about the subject. After the problem of the study was identified, a comprehensive literature review about PPP was performed, particularly in construction sector. The principal data sources were newspaper articles, journal papers, internet papers and conference papers, and professional and official government reports.

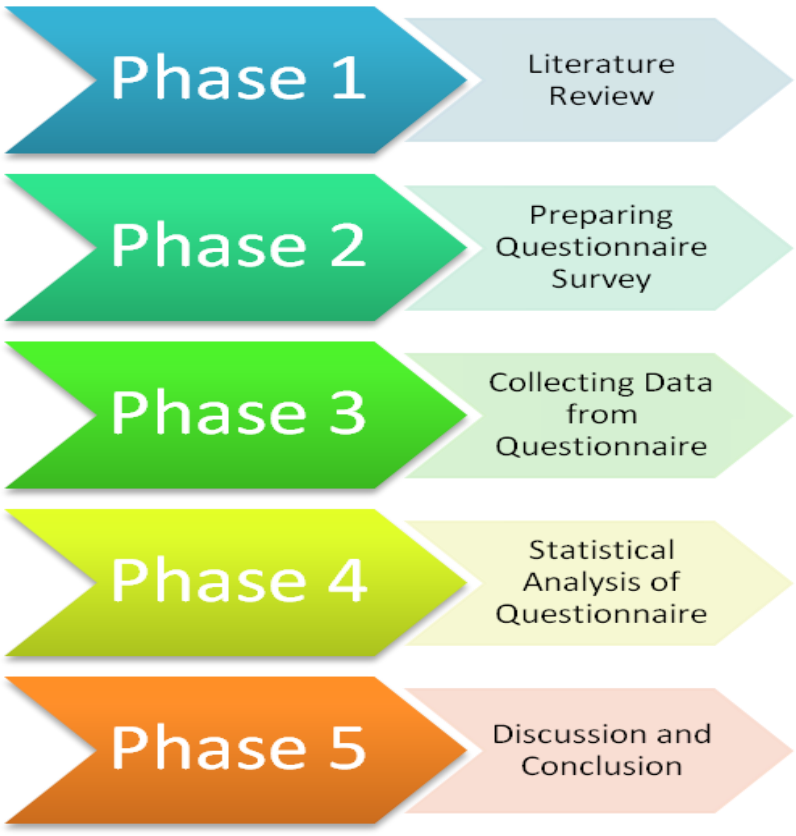

Figure 1.1. Research Procedure.

The second phase focuses on the questionnaire survey. After the completion of first phase results of the literature review part are used in this phase to develop questionnaire survey as a research tool in order to identify critical success factors for PPP projects in the Turkish construction industry. The questionnaire form was prepared by using Google Drive.

The detailed survey procedure, data collection and statistical method are presented in Chapter 4. The results of this phase are presented in two chapters (Chapter 5 and Chapter 6) dealing with PPP attributes and its critical success factors.

1.4.2. Research Methods

As presented before, a questionnaire survey is chosen as the main research instrument. The contents of the questionnaire are detailed enough to capture the issues involved in a PPP project.

This method allowed different opinions from the public and private participants to be compared using mean ranking scales. F ratio and significance are calculated to understand the different perspectives. A multi-variate statistical technique, known as factor analysis, is chosen as the method of statistical analysis, in order to group the CSFs variables into components with the help of the SPSS program.

1.4.3. Research Questions

According to Cooper and Schindler (2006) the research questions are considered as the best way of stating the purpose of the research study. The main research question of this study is ―what are the CSFs for procurement of capital projects using PPP arrangements? More specific questions such as enumerated below can be answered in the light of the issues raised in order to provide the information needed to make decisions:

- What are the CSFs for delivering PPP projects?
- How can CSFs which are peculiar to the successful realization and delivering PPP projects be identified?

To satisfactory arrive at a conclusion about the research question; the following investigative questions are formulated:

- What are the factors that contribute to the successful delivery of PPP projects?
- How can critical issues be identified to provide successful delivery of projects under the PPP projects?
- How can the factors that contribute to the successful delivery of PPP projects be assessed?

- What factors have been applied to the delivery of PPP projects and have contributed profitably to one or more of the parties involved?

1.5. Significance of the Study

The results of the research project may offer a number of remarkable advantages to current PPP project procurement and an approach to project delivery where the public sector is loading the risk and the contributions that PPP offers in off-loading the risk to the private sector. By identifying the CFSs for the procurement of capital projects, an insight and understanding of what steps business firms should take in the operating a PPP project; moreover, if project participants can predict probabilities of better success, they can take steps to:

- Avoid unsuccessful projects
- Identify good projects worth pursuing and
- Identify problems on current projects and take corrective measures to develop a framework that can help the private and the public sectors to develop the anatomy of the project being considered.

The concept of CSF may be applied to:

- The project itself,
- The consortium that sponsor the project and
- The political, social and economic environments where the project is located.

1.6. Definitions of Terms

Capital Project (CP) is defined as "to include state acquisition of capital assets or improvements and additions to these, construction and initial equipment, reconstruction, significant demolition, major alteration of any capital asset and major maintenance projects on assets that are state owned or used for state government purposes" (Legislative Fiscal Division, 2010).

Public-Private-Partnership (PPP) is defined by Skelcher (2005) as combination of the resource of government with those of private agents (business or not-for-profit bodies) in order to deliver social goals.

Critical Success Factor (CSF) is defined as "a limited number of areas which are critical to overall success, either in the context of an organization or a project execution. These are the few key areas where things must go right for the business to flourish and for the manager's goal to be attained" (Bullen and Rockhart, 1981).

Procurement is "a systematic process to purchase or get the needed products, services, or results from an outside source that performs the work. Procurement Management encompasses contract management and control processes needed to administer contracts or purchase orders. It also includes processes which help in administering a contract to assure the buyer/seller relationships are properly managed. Procurement means the whole-of-life cycle process of acquisition from third parties including goods, services and construction products, from initial concept through to the end of a services contract or the useful life of an asset, including disposal" (Australia Procurement Construction Council, 2002).

1.7. Structure of the Thesis

The remainder of this research project is described in the five remaining chapters. Chapter 2 reviews the literature on key areas of the dissertation topic, including procurement of capital projects, public-private partnership, PPP models in construction industry and critical success factors. Chapter 3 describes the selected research methodology in details. Chapter 4 is devoted to the collection of data and analysis of the findings. Chapter 5 is discussing PPP in Turkish construction industry, numeric data and legal framework. The final Chapter discusses the summary, implications, conclusion and recommendations for future research.

2. GENERAL OVERVIEW OF PUBLIC PRIVATE PARTNERSHIP

2.1. Introduction

In the last quarter of the 20th century, changes and interactions in economic, social and political meaning have resulted to some changes in the role of the state in infrastructure services, which has transformation from the service-producing and operating state understanding to policy maker and regulator state understanding (Ministry of Development, 2012).

Depending on scarce of public resources and cuts in these resources or directing these sources to nonrevenue public services PPP method has become widespread in terms of investment funding.

Today, infrastructure investments consume a large portion of traditional public funds allocated to investments. In particular, developing countries' financing need, required to accomplish infrastructure investments, has increased the interest to PPP which is widely used in recent years. At least in this way the public paves the way for investments which cannot be performed due to financial problems.

The private sector applications that support the production of public goods and services under various titles are referred to as PPP (Ministry of Development, 2012).

"Depending on a contract, realization of investments and services through sharing project cost, risk and returns between the public and private sectors" refers to PPP. Models such as Build-Operate-Transfer, Build-Operate, Transfer of Operating Rights, and Build-Lease are examples of the PPP implementations (Ministry of Development, 2012).

2.2. Current International PPP Implementation

2.2.1. Public Private Partnership in the World

In recent years, in both developed and developing countries, PPP projects have an important function in carrying out of infrastructure investments. According to the World Bank data in developing countries, the contract value of the PPP projects including privatization has increased steadily in the 1990s, and in 1997 reached the highest level (107 billion U.S. dollars). After falling to 48.7 billion U.S. Dollars in 2002, the annual amount started to rise again and reached the record level in 2010 (186.4 billion U.S. Dollars) (Figure 2.1).

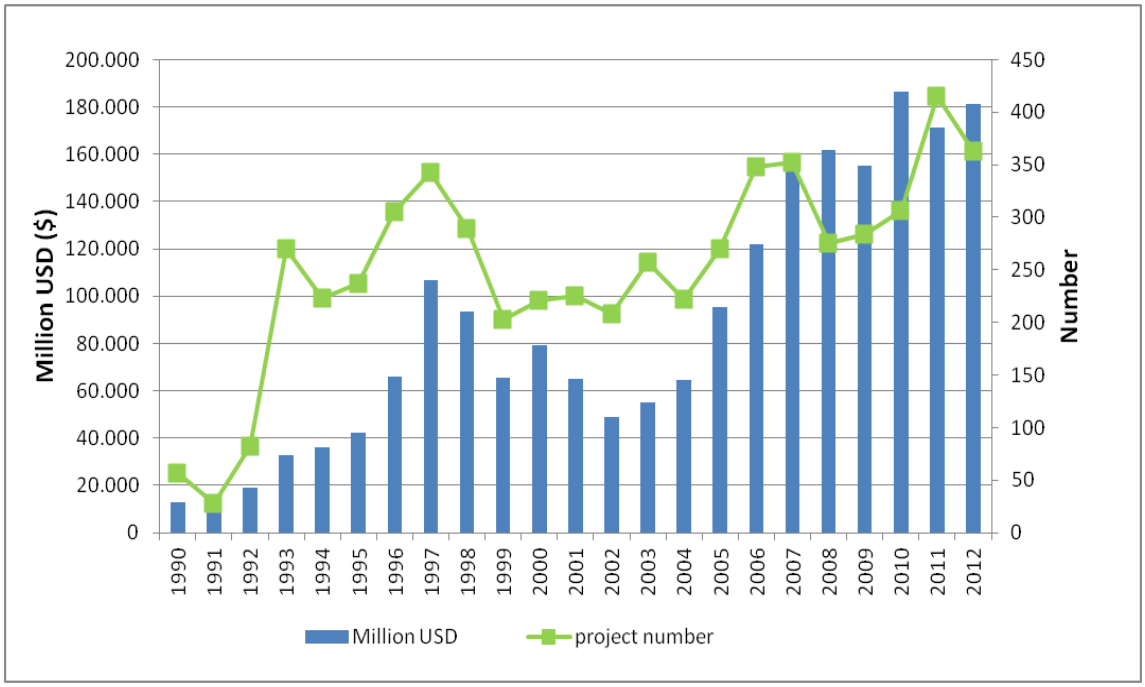

Figure 2.1. Value and Number of PPP Projects in Developing Countries by Years 1990-2012 (World Bank, 2012).

In developing countries during the period 1990-2012, by the end of the year 2012 in PPP field;

- The number of projects funded in the energy sector was 2.653 for an aggregate value of 715 billion U.S. Dollars.

- In the transport sector 1,473 projects have been funded for an aggregate value of 366.6 billion U.S. Dollars.
- The number of projects funded in telecom sector has reached 843 and their total value is 875.4 billion U.S. Dollars.
- In Water and sewerage sector 814 projects have been funded, the total cost is amounted 69 billion U.S. Dollars.
- The sectors mentioned above in developing countries, in total 5,783 PPP projects have been funded and the total cost of these projects has reached 2.026 billion U.S. Dollars (Figure 2.2).

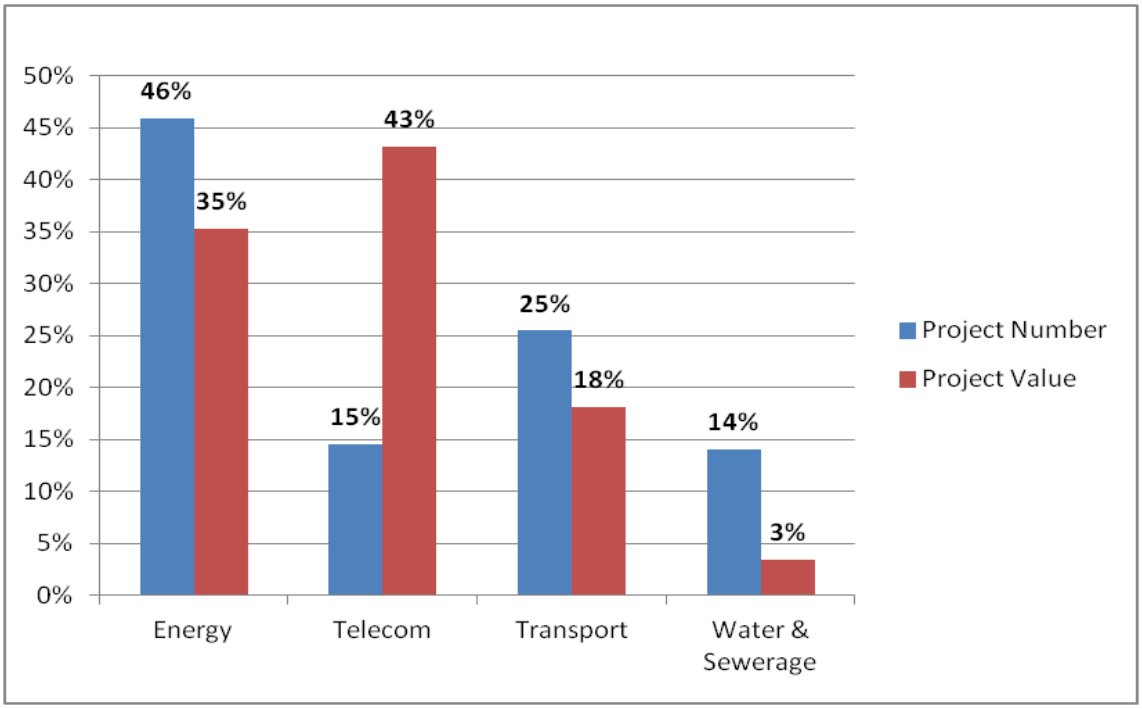

Figure 2.2. PPP Projects in Developing Countries by Sector 1990-2012 (World Bank, 2012).

According to the World Bank's database prepared based on PPP projects in developing countries, including privatizations, in terms of the number and the size of projects performed in between 1990-2012 years Latin America and the Caribbean region is placed on the top (Figure 2.3).

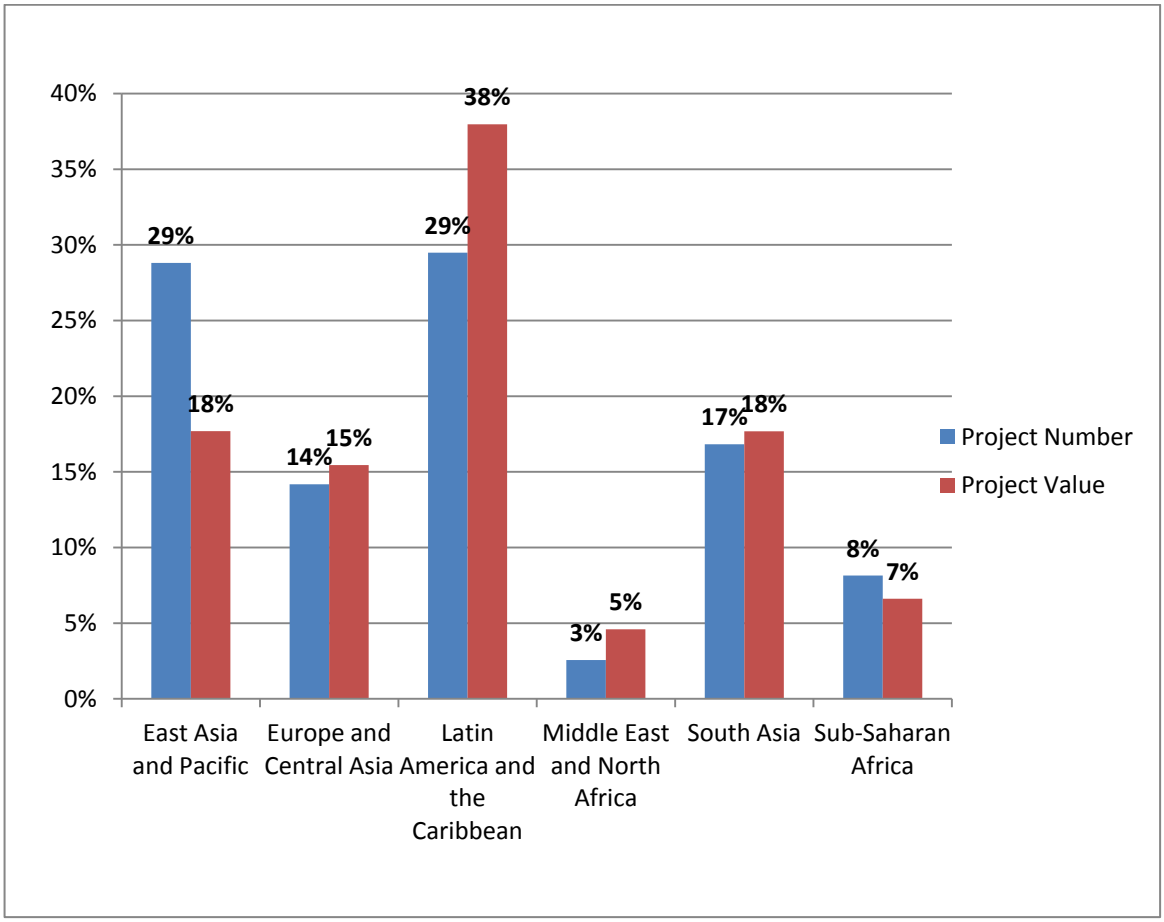

Figure 2.3. PPP Projects in Developing Countries By Region 1990-2012 (World Bank, 2012).

2.2.2. Public Private Partnership in European Union

There are a variety of applications of PPP in financing of public infrastructure across Europe. In recent years the traditional leading role of the transport sector is moving to environmental investments, equipment and building construction such as school, hospital and prison. When the individual performance of the EU countries in implementing PPP models is considered, besides UK in France, Spain and Germany PPP market has been developed and diversified (Ministry of Development, 2012).

Covering the period 1990- mid. 2013 in the European Union, in the last 22 years total number of PPP projects realized has reached 1626 for an annual average of 67, while

the aggregate value of the projects is 310.57 billion Euro for an annual average project size 12.94 billion Euro (Figure 2.4) (EPEC, 2013).

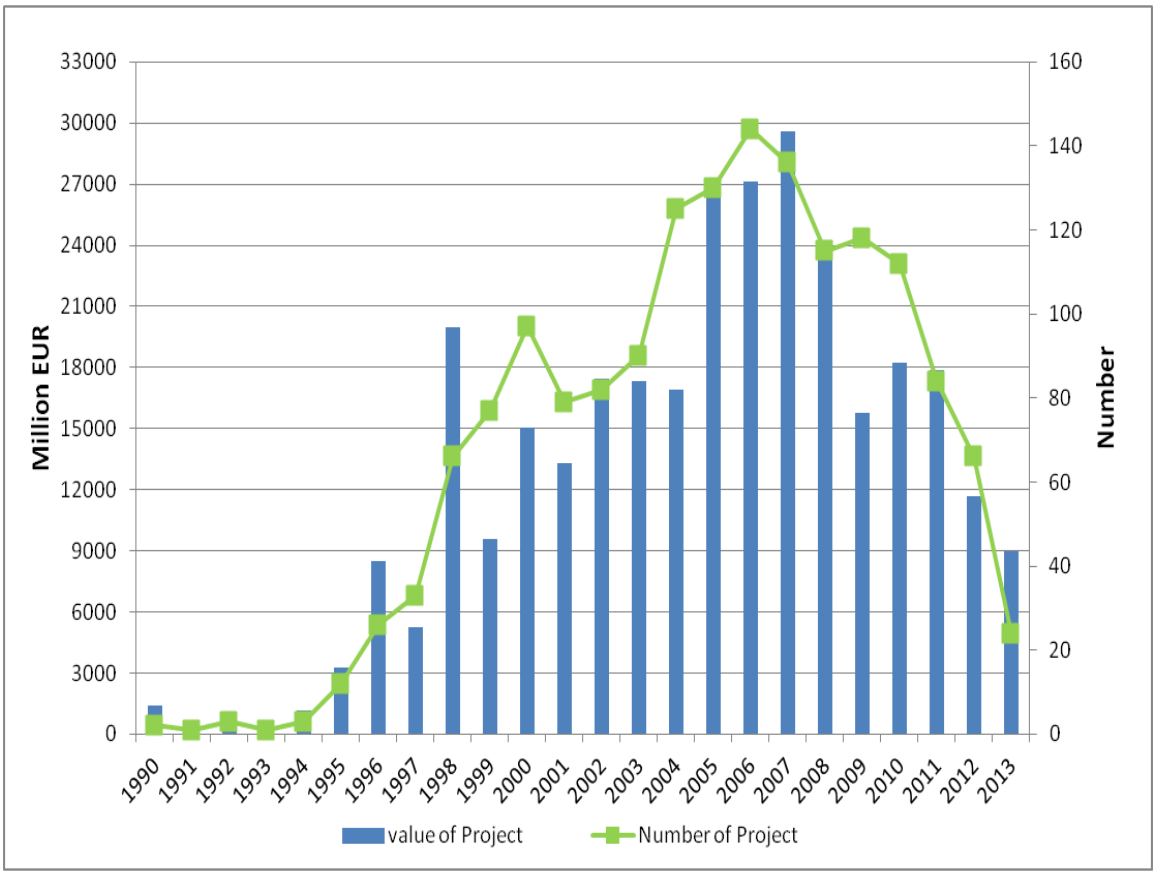

Figure 2.4. The European PPP Market by Value and Number of Projects 1990-mid. 2013 (EPEC, 2013).

In the first half of 2013 the total cost of PPP projects in the EU market amounted 9 billion €. In 2013 (first half) and 2012 the size of the project has been lower than the year 2011 level (€ 17.9 billion), but it is still below the peak period of 2005-2007 (EPEC, 2013).

Across the EU in the years 2012 and the first half of 2013 the number of PPP projects carried out is 24 and 66, respectively, and these numbers are quite lower than the number of projects implemented in the years 2011 and 2010, 84 and 112, respectively. While the average size of PPP projects was € 177 million in 2012, in the first half of 2013 it rose to € 375 million (Figure 2.5) (EPEC, 2013).

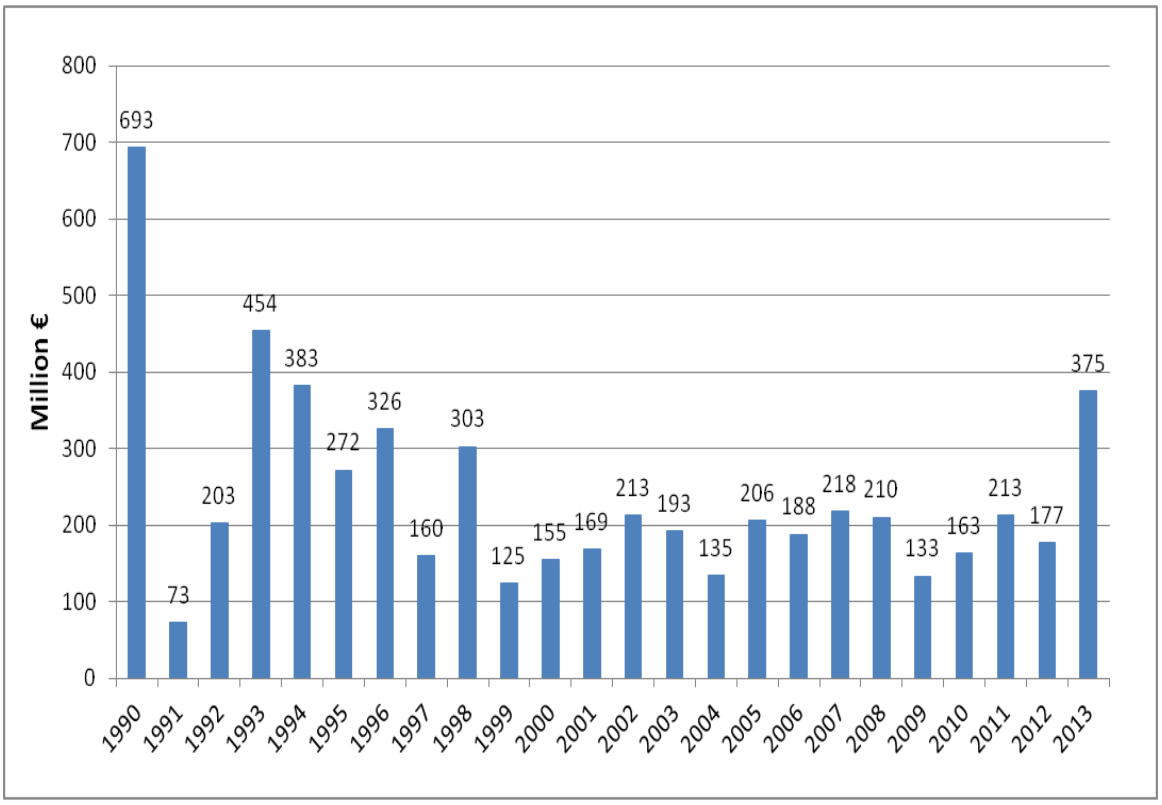

Figure 2.5. The European PPP Market by Average Value of Projects 1990-mid. 2013 (EPEC, 2013).

Regarding the sectorial distribution of the EU PPP market in the first half of 2013 in terms of the number of projects performed transport (six road projects and one railway project) and environment sectors, in front of the education and healthcare sectors, with 7 projects and 29% share emerged as the most active PPP sectors. In 2013 for the first time environment sector ranked first place (Figure 2.6) (EPEC, 2013).

When EU PPP market in 2013 was examined in terms of size of the project, the transport sector, as in previous years, share was on the first rank with 77% for an aggregate value of EUR 6.9 billion. Transport sector was followed by environment projects that had raised its share to 12% (EUR 1.1 billion) and education sector was the third most active sector with four transactions. These were followed by healthcare sector with a share of 3% for an aggregate value of EUR 250 million, general public services and the public order and safety projects with a share of 1%, respectively (Figure 2.6) (EPEC, 2013).

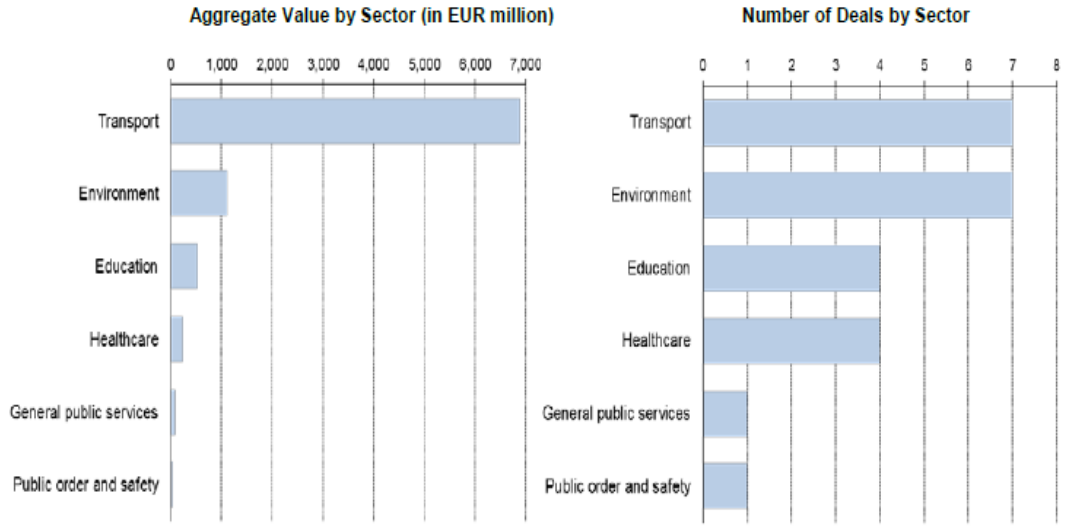

Figure 2.6. Sector Breakdown by Value and Number of Transactions (EPEC, 2013).

When countries were analyzed in terms of project size between the years 1990-2009 the UK's PPP market accounted for more than half of the entire and it was emerging that total of seven countries constituted about 90% of the market. However, the number of projects supremacy of England in 2010 continued while at the point of total value of the project Spain took over the leadership role in the EU PPP market. In the first half of 2013, with 12 projects for € 3.3 billion both in the total number of PPP projects and the total size of the project by taking over from Spain the United Kingdom had been in the first place. Turkey and Italy followed UK (Figure 2.7) (EPEC, 2013).

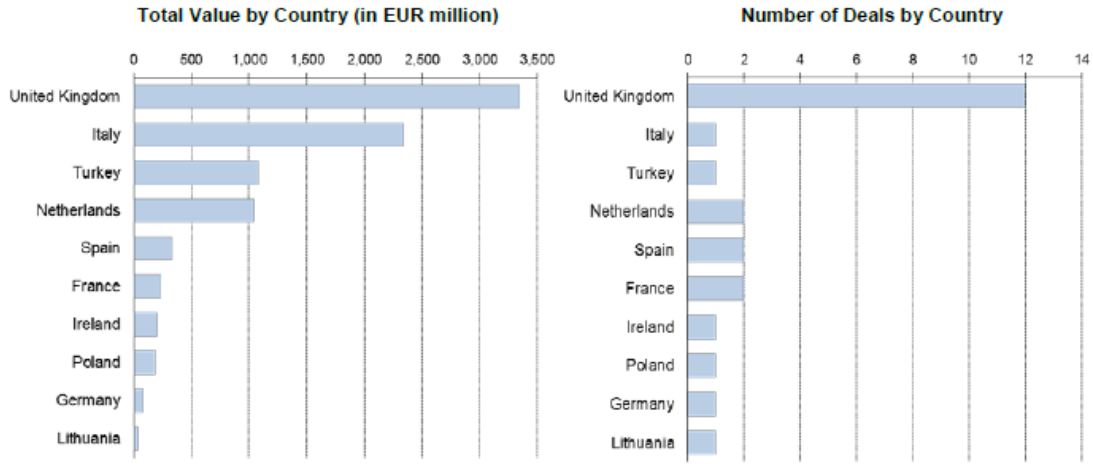

Figure 2.7. Country Breakdown by Value and Number of Transactions (EPEC, 2013).

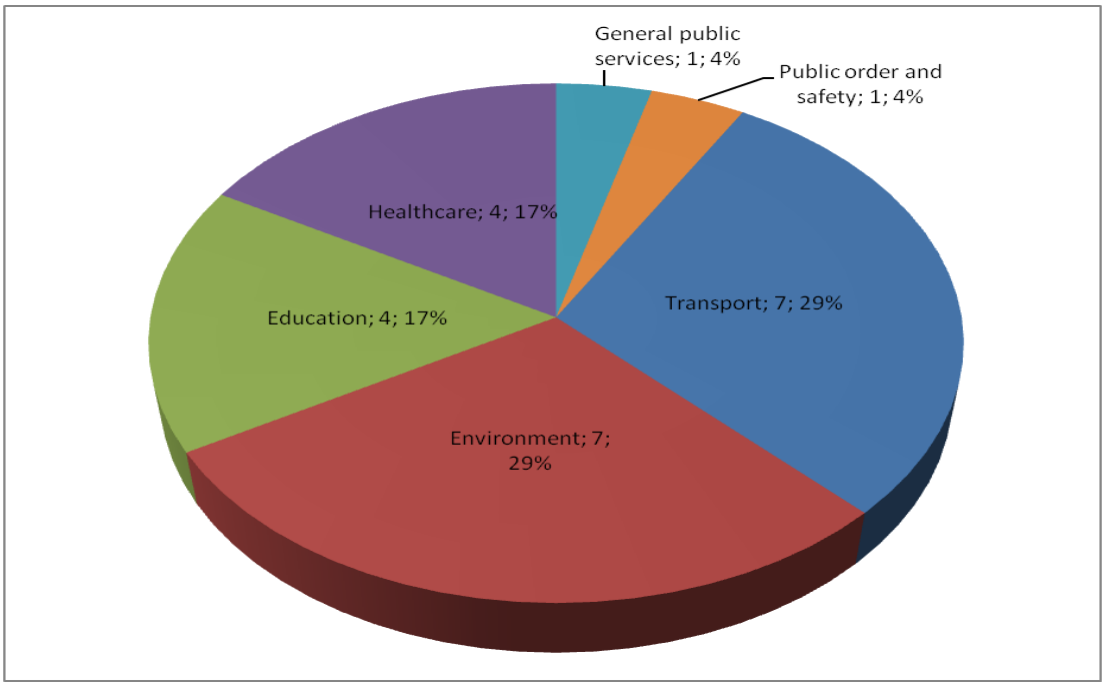

Figure 2.8. PPP Projects in the EU in 2013 by Number and Percentage (EPEC, 2013).

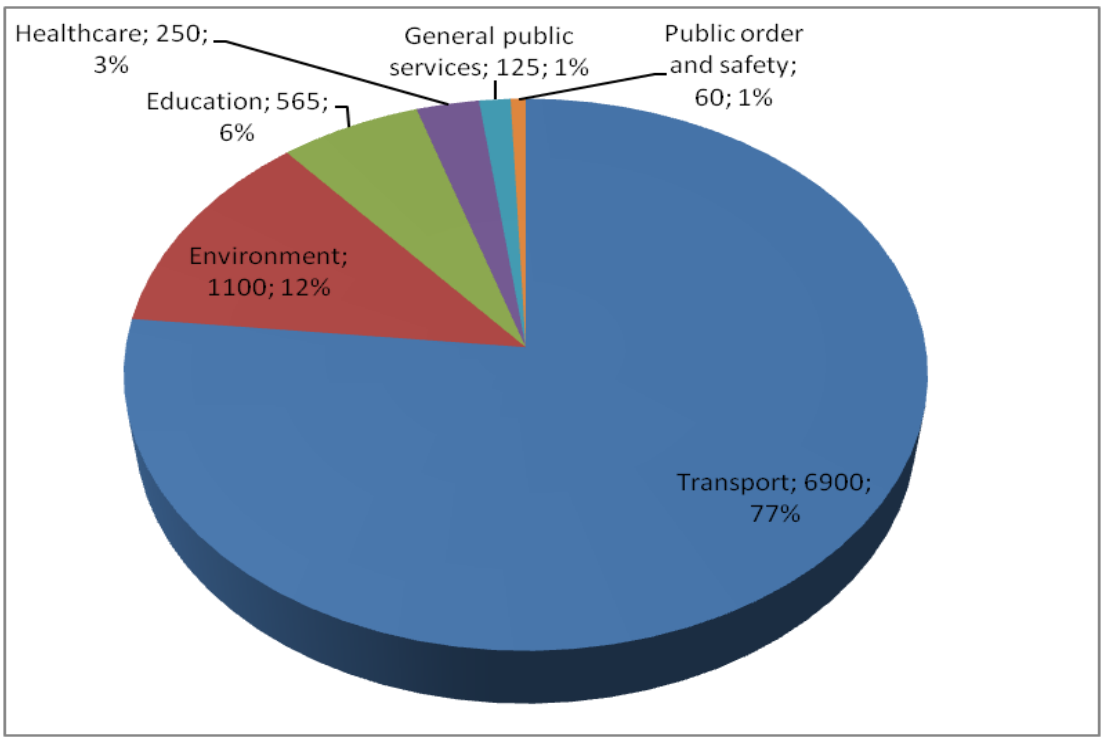

Figure 2.9. PPP Projects in the EU in 2013 by value and percentage (EPEC, 2013).

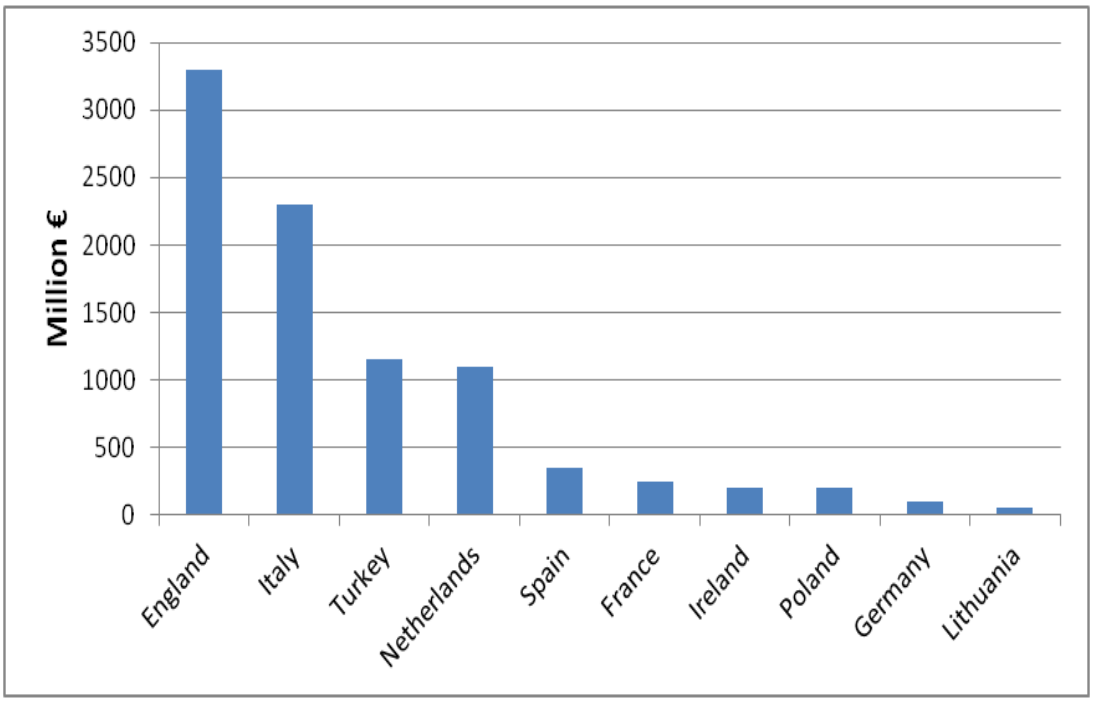

Figure 2.10. PPP Project Values in the EU in 2013 by Countries (EPEC, 2013).

In terms of number of the PPP projects, that reached financial closure, the most active country UK carried out 12 projects. France (2), Netherlands (2), Spain (2) followed UK (Figure 2.11). These four countries accounted for 75% of the EU total in 2013 (EPEC, 2013).

Remarkable PPP projects reached financial close in the first half of 2013 are as follows:

- The 3000-room University Hertfordshire Accommodation Project (UK) includes construction and operation of rooms, community areas and infrastructure works and index-linked unwrapped private bond debt financing is the interesting part of this project.
- The Poznan Waste Project (Poland) is related to the construction of energy-from-waste facility with a capacity of 210,000 tons per year and operation of the plant for 25 years after completion; the project endeavors to unify PPP structure with EU fund structure.

- The BreBeMi Motorway Project in Italy is the largest deal in the European PPP market with a value of EUR 2.3 billion in the first half of 2013. The 62 km highway will be constructed between Brescia and Milan under the 20-year real-toll concession.
- The Gebze-Izmir Road Project, which is the largest infrastructure project of Turkey with a capital of EUR 2.2 billion and a EUR 1.1 billion 7-year term loan, will be constructed to connect Istanbul and Izmir under the 22-year concession.

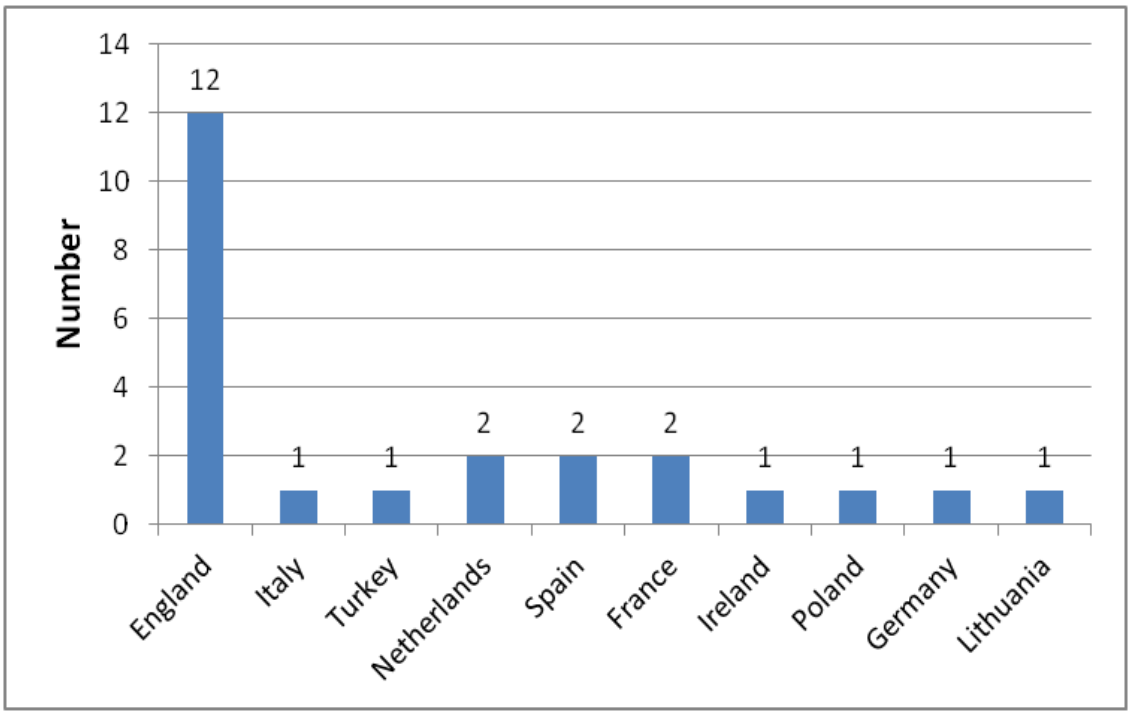

Figure 2.11. PPP Project Number in the EU in 2013 by Countries (EPEC, 2013).

Consequently, considering the period of 1990-2013;

- UK is a major part of the market,
- The most of the PPP models were applied to transportation sector.
- Average annual number of carried out PPP projects was 67, while the average project value was estimated at € 239 million (EPEC, 2013).

2.3. PPP Development in Turkey

With the target of entering into the world's top ten largest economy in 2023, public investment for infrastructure plays an important role in Turkey. Private sector driven development model was adopted in the 1980s as a result public investments in industry decreased and infrastructure investments came to the fore in central investment budget. In this context, in recent years especially transport, irrigation and energy sectors, infrastructure projects can be described as large-scale, have become large part of public investments. In addition, since the country has entered a period of rapid growth, to meet the excessive need for infrastructure investment, beside the public resources Public Private Partnership (PPP) models have been often used as alternative financing models (Ministry of Development, 2012).

During the period, in our country by getting authorization from the High Planning Council for many PPP projects vary from energy, transportation, customs gates up to industrial facilities projects have been implemented in different areas (Ministry of Development, 2012).

2.3.1. PPP Evolution History in Turkey

In addition to improving the existing infrastructure in our country, the need in the direction of the realization of additional infrastructure investments is constantly increasing. Expanding population and urbanization, growing economic and commercial activities bring about the need for infrastructure investments. However, Turkey's existing infrastructure in terms of intensity as well as standards is below the level in developed countries (Ministry of Development, 2012).

Public and private sector collaboration applications are traced back to the Ottoman Empire era, concessions related to public service have gained legal status with the dated June 10, 1326 (1910) Menafii Umumiyeye Müteallik Imtiyazat (Concessions Regarding Public Services) Law (Ministry of Development, 2012). In the Ottoman Empire towards the end of the 19th century the establishment and operation of railway, port, dock, electricity and other public services, businesses had been tried to be provided with

concessions that had been given to the foreigners. Starting from 1860, some of the railroads had been built by foreign companies within 50 years. Companies engaged in these railways, with the agreement, obtained the right of the operation of these roads for a long time. The BOT model applied today was applied at that time. Local governments were authorized for granting the concession during the imperial era (Firat Development Agency). During the 1870s, tunnel underground transportation system which was constructed by an entrepreneur French engineer Eugene Henry Gavand with a concession, given by the time of the Ottoman Sultan Abdulaziz for building and operating the underground between Karakoy and Pera, was the first example of the BOT model in Turkey. Gavand in 1871, including the construction and operation of the tunnel, obtained a 42-year concession right from the Ottoman Sultan in exchange for 6250000 French francs. To undertake the investment and the operation of the transport system in England 6,250,000 French francs capital "The Metropolitan Railway of Constantinople from Galata to Pera" private company was founded in July 1872. Tunnel was completed as planned in December 1874 and put into operation in January 1875. For 25 years, the system had been operated successfully by the company and in 1900 an application was made to the Ottoman government for extending the concession rights. In that period, because of some political reasons no extension on project duration was consented Later in 1911, the British company put concession right up for sale and transportation system was transferred to " Deraader Mülhakatında Galata ve Beyoğlu Beyninde Tahtelarz Railroad Company " established that year and the concession right had been extended until 2000. The system was purchased at a price of 175 000 Turkish Liras and nationalized by the Government of the Republic of Turkey in 1938 (Arioglu and Arioglu, 1995). By the end of the 1970s and the beginning of the 1980s, due to the four major developments new funding models for large projects seeking had started;

- Increased infrastructure need due to population growth and economic growth,
- In third world countries emerging economic crisis caused by the payment difficulties resulted from excessive borrowing,
- Large construction companies had the difficulty of finding profitable new projects,

- In 1980s the privatization applications, advocated by the governments of many countries and international loan institutions, began.

The Turkish Electricity Authority (TEK), which subjected to the municipality until 1982, including all electricity activities except distribution was established as an integrated monopoly in 1970. Because of the adverse economic conditions of period, the necessary investments for new projects as well as renovation and maintenance could not be supplied by government (Vagliasindi and Besant-Jones, 2013).PPP for the first time in its present form has begun to be implemented with Law No. 3096 on electric power generation accepted in December 4, 1984 to set up a framework for private participation in the electricity sector by removing TEK's monopoly power. This law allows private sectors to generate electric energy and sell to government (TEK) for some particular time and concession agreements have transformed to new form as Build-Operate-Transfer (BOT), the term first used by former prime minister of Turkey Turgut Özal. At the end of the contract period, the property would be transferred to the state at no charge but all these models based on take-or-pay contracts require treasury guarantee as a result they could not be successful on reducing the financial burden on the central budget (Vagliasindi and Besant-Jones, 2013).

Law No. 3096 that outlined the BOT model was insufficient in attracting remarkable number of private investors in energy sector because of the Constitutional Court's approach regarding generation, transmission, and distribution of electricity as public service based on the Turkish Constitution. Thus all private initiatives for electricity production had to be carried out in the form of concession. Concessions are subject to approval of numerous state agencies such as the Ministry of Energy and Natural Resources, High Planning Council, State Planning Organization, and the Treasury; moreover, the Council of State is authorized with approving investors and this process can take some time. Annually 8 percent increase in electricity demand is expected and corresponds an equally growth rate in the power generation need, but because of the shortage in the central budget Turkey had to tend towards private investments, in particular foreign (Vagliasindi and Besant-Jones, 2013).

In 1994 the Turkish Parliament passed Law No. 3996, which was intended to enhance the attractiveness of BOT projects to foreign investors by authorizing Treasury guarantees for the obligations of the off-taker and fuel-supplier (in the case of gas-fired IPPs), and providing tax exemptions. In an attempt to bypass the Council of State, the law contained language that laid out certain arrangements that would be non-concessionary and therefore subject to private law, but the Constitutional Court struck down the framework as unconstitutional in March 1996 (Vagliasindi and Besant-Jones, 2013).

In June the Turkish Council of Ministers issued Decree No. 96/8269 concerning a new model for private participation in the power sector. The decree created the Build-Operate (BO) framework, whereby private firms would retain ownership of the facility rather than transfer it to the state. After a poor response to the first government tender for power plant construction under this framework, the ministry revised the terms. One important change was that companies would be eligible for dispute resolution under the UN Commission on International Trade Laws rather than in the Turkish administrative court system. The new tender also offered the possibility of 100 percent Treasury guarantees for the obligations of TEAS for the duration of the sales contract. Before any companies had a chance to build any power plants under the new BO terms, however, the Council of State suspended the decree, claiming that the previous BOT law was applicable and that an alternative model should be passed by Parliament and not by ministerial fiat (Vagliasindi and Besant-Jones, 2013). In our country, with the Law No. 3996 " Concerning the Realization of Certain Investments and Services in the Build-Operate-Transfer Model " issued in 1994 wide spreading and from highways, airports, marinas to the customs gates in so many different sectors successfully implemented PPP projects (Ministry of Development, 2012).

In July 1997 the Turkish Parliament passed the BO Law (Law No. 4283), which repeated the revised ministerial decree except that it exempted hydroelectric, nuclear, and geothermal plants from consideration. In 1999 the Turkish Parliament passed a constitutional amendment that applied private law to infrastructure investment in the electricity sector and that limited the Council of State's role in the review process. This IPP framework was successful in attracting foreign investment. These obligations put an immense financial burden on TEAS. The guarantees were necessary because of TEAS's

financial weakness, which was caused by a high level of electricity losses resulting from technical factors, theft, and nonpayment. In addition, the repeated macroeconomic shocks Turkey had experienced over the previous decade had weakened the federal budget (Vagliasindi and Besant-Jones, 2013).

The Turkish healthcare market has in recent years undergone major reforms that to be completed will require substantial new investments in healthcare. These reforms have occurred as a result of liberalizing the healthcare market, the healthcare market being fast growing, and Turkey's potential accession to the EU. Due to the limited available public resources to fund these new investments in healthcare, the government has decided to procure them by using a build-lease-transfer model via public-private partnerships (or PPPs) (Rodrigues, 2013).

In Turkey, the roots of the public-private partnership model in the health sector may be found in the Health Services Fundamental Law No. 3359. Law No. 3359 enabled public health institutions to be converted into public corporate entities by way of a Council of Ministers decision. The first regulation explicitly providing for the provision of health services with public-private partnerships was made with the addition of the Supplemental Article 7 to Law No. 3359. Pursuant to Supplemental Article 7, the construction of health institutions may be procured from private entities where the Higher Planning Committee deems it necessary (Erdem, 2013).

The explicit regulation brought by the Supplemental Article 7 also fulfills the Constitutional requirement that public services to be procured from private entities by way of private law contracts shall be determined by way of law (Erdem, 2013).

Pursuant to Supplemental Article 7 of Law No. 3359, the renovation of the facilities, procurement of medical equipment, management of the commercial areas within the facilities and the procurement of non-medical equipment of health institutions may also be realized by the private party (Erdem, 2013).

The Regulation on the Construction of Health Facilities in return for Lease and the Renovation of Health Facilities in return for Management of Non-Medical Services and

Areas (“Regulation”) entered into force in 2006 (Erdem, 2013). Today within the scope of Law No. 3359 "Health Services Fundamental Law" have gained a new dimension with integrated health campuses which will be held under the Build-Lease model (Ministry of Development, 2012).

Various actions of annulment were initiated against tenders realized under Supplemental Article 7 of Law No. 3359 and the Regulation, and a claim of unconstitutionality was made within this context. The Council of State found this claim to be of importance, thereby carrying the issue before the Constitutional Court. The claim of unconstitutionality was based on the fact that Supplemental Article 7 did not regulate the matter in detail and many aspects that should have been regulated by law were in fact regulated with the Regulation (Erdem, 2013).

A new regulation was required in order to eliminate the criticism directed at Supplemental Article 7 of Law No. 3559 and to facilitate the financing of ongoing projects. Accordingly, Law No. 6428 dated 21/02/2013 was prepared and Supplemental Article 7 was abolished. The negative implications that a possible abrogation decision to be handed down by the Constitutional Court would create were thereby avoided since Constitutional Court decisions cannot be made retroactively. Since Supplemental Article 7 was abrogated, it may even be said that claims of unconstitutionality against said article have become void (Erdem, 2013).

Pursuant to Law No. 6428, legislation making reference to Supplemental Article 7 of Law No. 3359 shall be deemed to reference Law No. 6428. Projects tendered before the promulgation of Law No. 6428 shall be governed by the old legislation. However there is an exception to this. For projects tendered while Law No. 3359 was operative, project specifications regarding the commercial management by the private party of areas outside the health facilities shall not be applied (Erdem, 2013).

According to Article 10 of Law No. 6428, the application principals of the law shall be regulated with a regulation to be prepared by the Ministry of Health and promulgated by the Council of Ministers. However, until the entry into force of such new regulation, the

Regulation for the application of Supplemental Article 7 of Law No. 3359 shall continue to be applied (Erdem, 2013).

Furthermore, with Decree No. 652 “Relating the Organization and Duties of the Ministry of National Education” educational facilities, and with Law No. 351 "Higher Education Credit and Hostels Institution" dormitory and student accommodation facilities can be carried out by PPP method (Ministry of Development, 2012).

Implementation process of the PPP model in Turkey begins with taking the administrative decision which allows the realization of planned investments and services by PPP model. Administration who wants to make the investment and services with the Minister signed preliminary feasibility study of the project shall apply to the High Planning Council. Local governments apply the High Planning Council through the Ministry of Interior, while higher education institutions apply through the Ministry of National Education. After the Board's permission, the contract can be signed with an equity company or a foreign company (Firat Development Agency).

In our country, within the scope of Law No. 3996 and 3359 so far, authorization was gotten from the High Planning Council (HPC) for totally 137 projects and the contracts of 60 projects were signed. 31 of 60 projects are in operation, the remaining 29 are under construction. In projects whose application contracts were signed, in terms of the number of contracts marinas and customs facilities were in the first place, and the marinas were followed by highways and airports. Within the last 3-year period with 20 projects, the maximum number of authorization from High Planning Council was gotten by Health sector that aimed providing its services in more modern conditions with integrated campuses construction (Ministry of Development, 2012).

In addition to the project mentioned above, 17 motorway service facilities projects not subjected to the authority of the High Planning Council and 25 energy projects have been implemented through BOT model. Moreover, in the energy sector there were 28 Transfer of Operating Rights (TOR) which was already in operation and 5 Build-Operate (BO) modeling PPP projects. Also, by Privatization Administration 16 ports, by General Directorate of State Airports Authority 5 and by Undersecretariat for Defense Industries 1

in total 6 airports' operating rights were transferred to the private sector (Ministry of Development, 2012).

In total, including 73 BOT, 5 BO and 61 TOR modeled projects; 10 TOR modeling projects included in this category comprised the hydroelectric projects whose implementation contracts were signed but transfer agreements not approved yet, number of projects realized using PPP model is 139. Total 28 of the PPP projects under construction consisted of 23 BOT, 5 BLT (Ministry of Development, 2012).

Table 2.1. Number of PPP Projects in Operation in Turkey by Sector (adapted from Ministry of Development, 2013).

PPP Projects	Highway	Airport	Sea Port	Marina and Tourism Facility	Customs Facility	Industrial Plants & Urban Infrastructure	Hospital	Power & Energy	Total
BOT	19	8	3	8	8*	2		25	73
BO								5	5
BL									0
TOR		7	16					38	61
TOTAL	19	15	19	8	8	2	0	68	139

*Nusaybin Customs Gate (Investment that started in 2010 is completed but because of incidents in Syria the gate has not been opened yet).

Table 2.2. Number of PPP Projects under Construction in Turkey by Sector (adapted from Ministry of Development, 2013).

PPP Projects	Highway	Airport	Sea Port	Marina and Tourism Facility	Customs Facility	Industrial Plants & Urban Infrastructure	Hospital	Power & Energy	Total
BOT	10	2	1	5	5				23
BO									0
BL							5		5
TOR									0
TOTAL	10	2	1	5	5	0	5	0	28

Table 2.3. Number of PPP Projects in Turkey by Sector (Total) (adapted from Ministry of Development, 2013).

PPP Projects	Highway	Airport	Sea Port	Marina and Tourism Facility	Customs Facility	Industrial Plants & Urban Infrastructure	Hospital	Power & Energy	Total
BOT	29	11	4	13	13	2		25	108
BO								5	5
BL							5		5
TOR		6	16					38	60
TOTAL	29	17	20	13	13	2	5	68	167

When contract size of PPP projects already in operation and under construction is analyzed, Turkey's extensive experience in this area is remarkable. Total contract size of PPP projects with the prices of 2013 has reached 87.5 Billion USD. In the projects airport and energy sectors, respectively, with the amount of 51.68 and 17.89 billion USD are taking the lead (Figure 2.14) (Ministry of Development, 2012).

Table 2.4. Value of PPP Projects in Turkey by Sector (adapted from Ministry of Development, 2013).

SECTORS	**TOTAL ($)**
Highway Projects	10,646,863,811.13
Airport Projects	51,681,191,050.00
Sea Port Projects	1,598,884,785.00
Marina & Tourism Facility Projects	270,633,513.00
Customs Facility Projects	359,688,021.66
Industrial Plants & Urban Infrastructure	1,307,035,433.00
Hospital Projects	3,816,554,228.00
Power & Energy Projects	17,894,274,113.28

In brief, when PPP projects in operation and under construction until today are considered together, the total value exceeds 87.5 billion U.S. dollars for 167 projects are seen to be signed (Ministry of Development, 2012).

In our country, in 1986 with energy projects PPP models had been used in investments, and by the end of 2013 with Build-Operate, Build-Operate-Transfer, Build-Lease and Transfer of Operating Rights models in 8 different sectors total of 167 projects' implementation contracts were signed. Regarding the sectorial distribution of implementation contracts with 68 projects energy sector took the first place. Although number of road, port, airport and marina projects is less than the number of projects in the energy sector, these sectors are other areas which have long-term experience in PPP (Figure 2.12) (Ministry of Development, 2012).

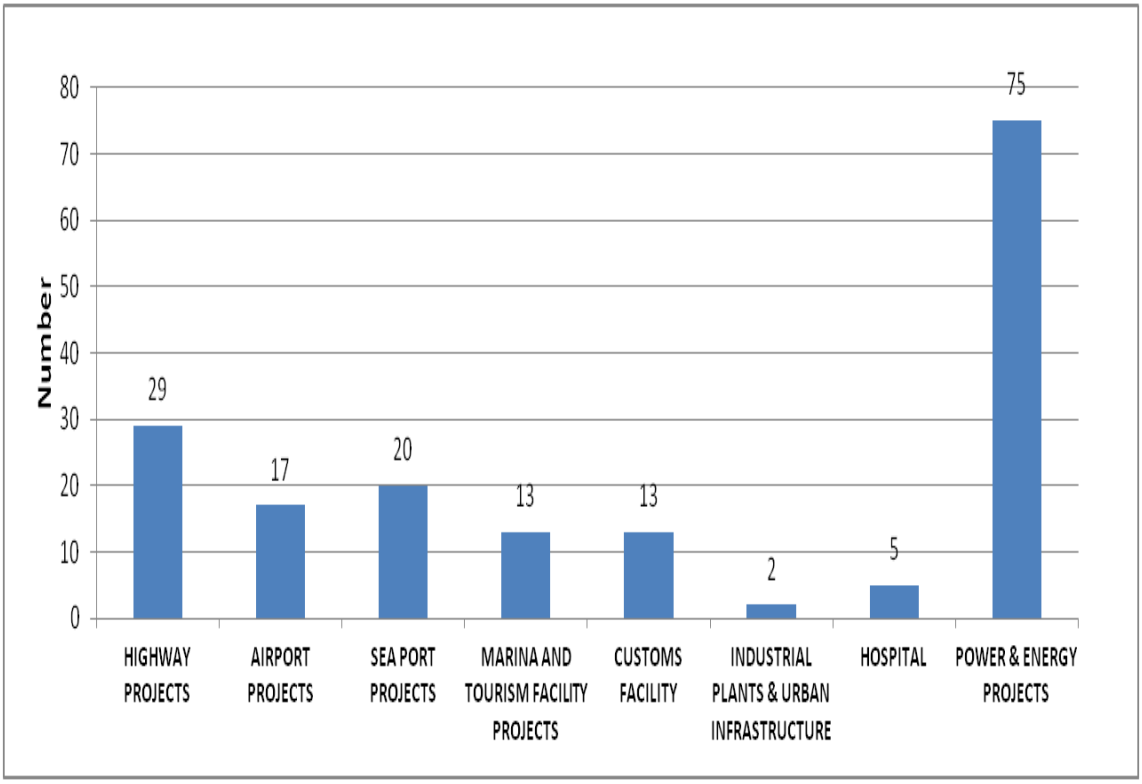

Figure 2.12. Number of PPP Projects in Turkey by Sector (adapted from Ministry of Development, 2013).

In terms of the sectorial distribution of the contract size, sourcing from especially fairly high levels of the price of TOR it is seen that airport projects, in front of the energy projects, are placed on the top. With the road projects following those, these three sectors constitute 91.6% of total portfolio. Integrated health care facilities follow these three sectors with share of 4.36%. Even though port, marina and customs projects are numerous

in terms of the project size they constitute total of 2.5% part (Figure 2.13) (Ministry of Development, 2012).

From 1986, when PPP projects were implemented for the first time, until today how the total stock changed was examined especially in 2003 and later, significant increases in the PPP investments were observed (Figure 2.17) (Ministry of Development, 2012).

Regarding the distribution of projects by models in our country the most widely used PPP model is Build-Operate-Transfer with 97 projects. While the projects whose operating rights have been transferred have 36% share of, except Natural Gas Combined Cycle Power Plants built for electricity generation with the Build-Operate model the Build-Operate model appears to be unused. With the realization of integrated health campus projects, which are currently in the bidding phase, the Build-Lease model will increase its share in the total (Figure 2.18) (Ministry of Development, 2012).

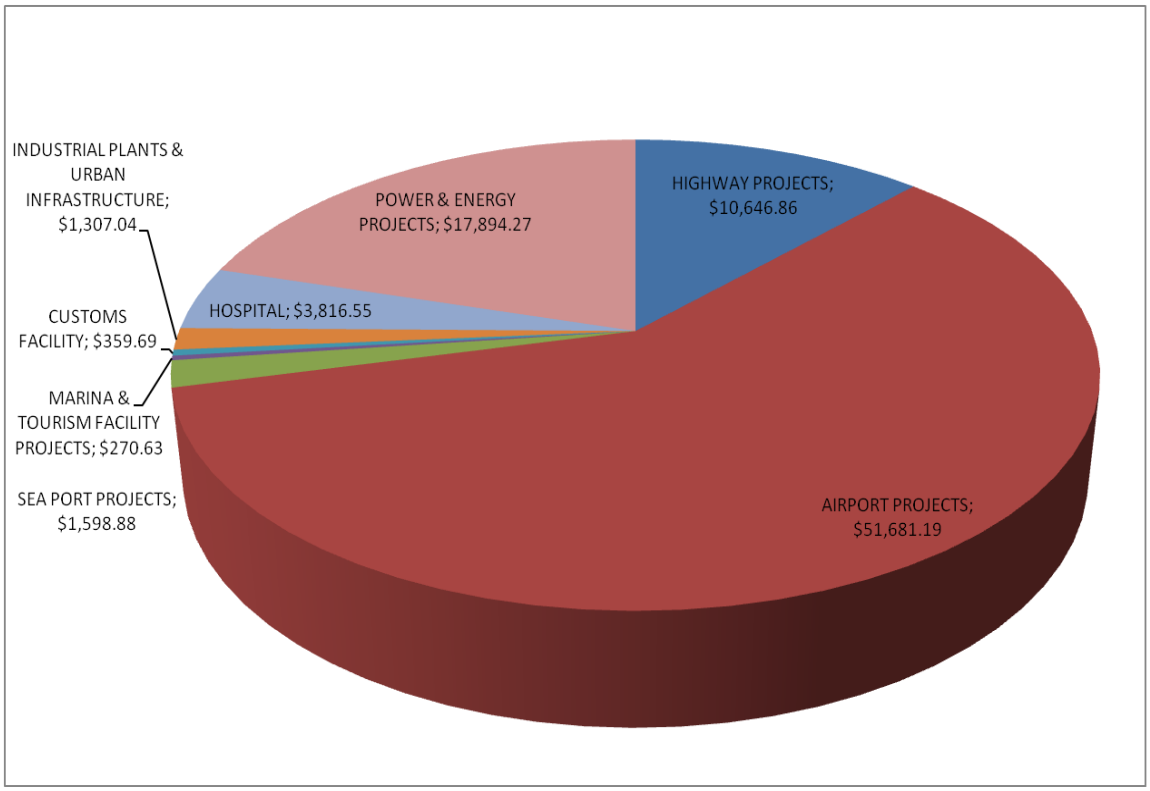

Figure 2.13. Value of PPP Projects in Turkey by Sector Million USD (adapted from Ministry of Development, 2013).

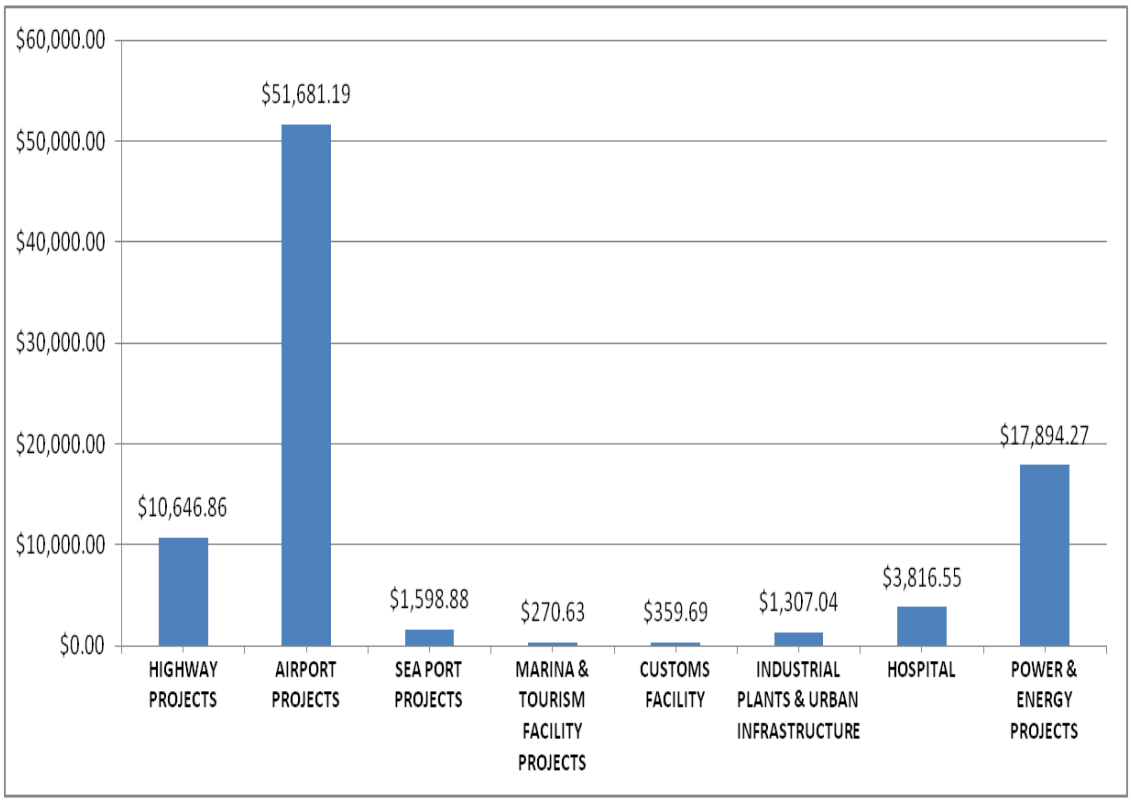

Figure 2.14. Value of PPP Projects in Turkey by Sector Million USD (adapted from Ministry of Development, 2013).

In the period from 1986 until today, even though the jump occurred in the number of PPP projects after 1995, the rate began to fall again in 1999. By year 2009, the PPP again gained momentum and in 2011 reached the highest level with 17 projects. In 2013 16 PPP contracts were signed (Figure 2.15).

Considering the contract value by year, though after 2003 overall increased, notable increase was experienced after 2012. PPP projects before the year 2012 in the share of public investment were rather small, after that year a large increase occurred. At the end of the year 2013 PPP contract value was $ 46.14 billion (Figure 2.16).

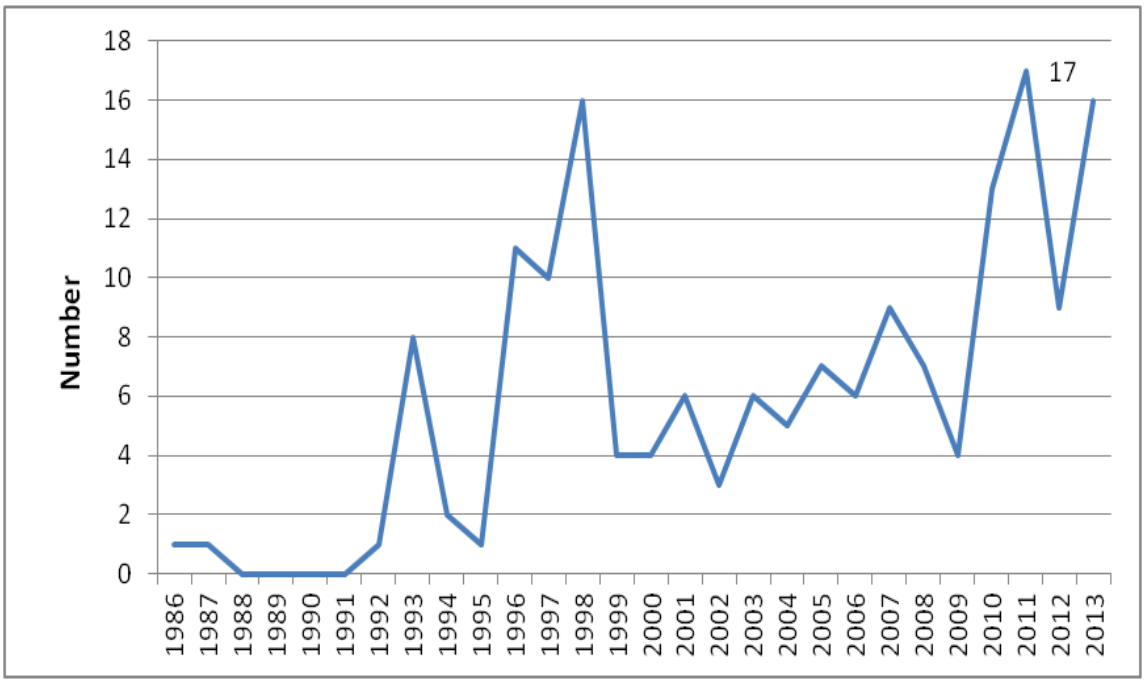

Figure 2.15. Number of PPP Projects in Turkey by Year (adapted from Ministry of Development, 2013).

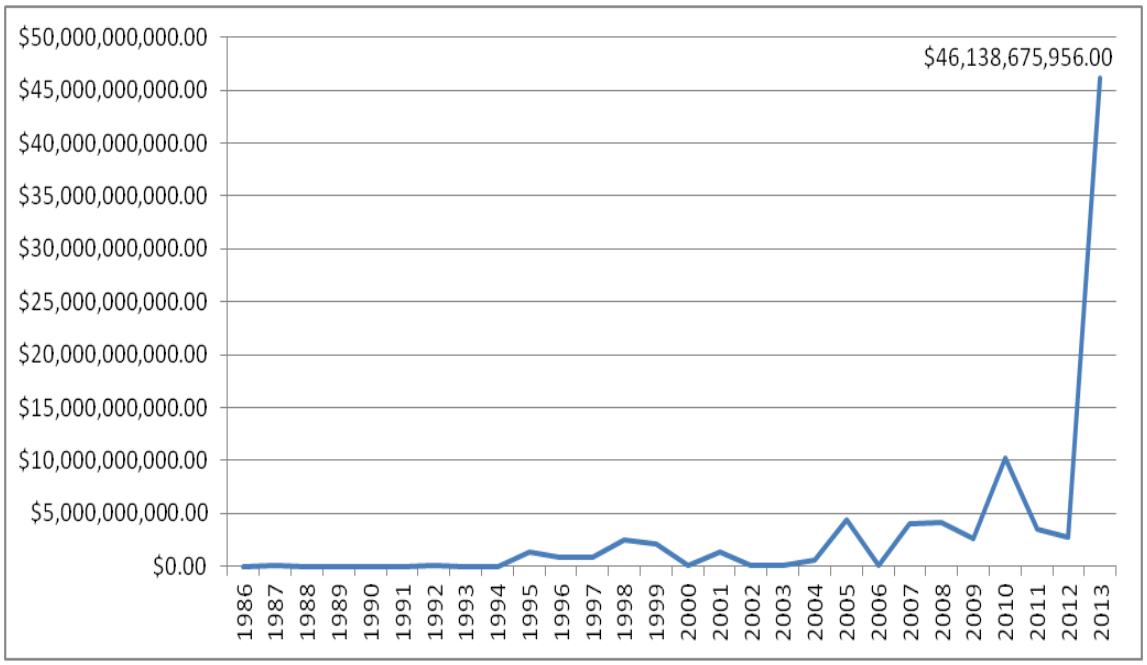

Figure 2.16. Value of PPP Projects in Turkey by Year USD (adapted from Ministry of Development, 2013).

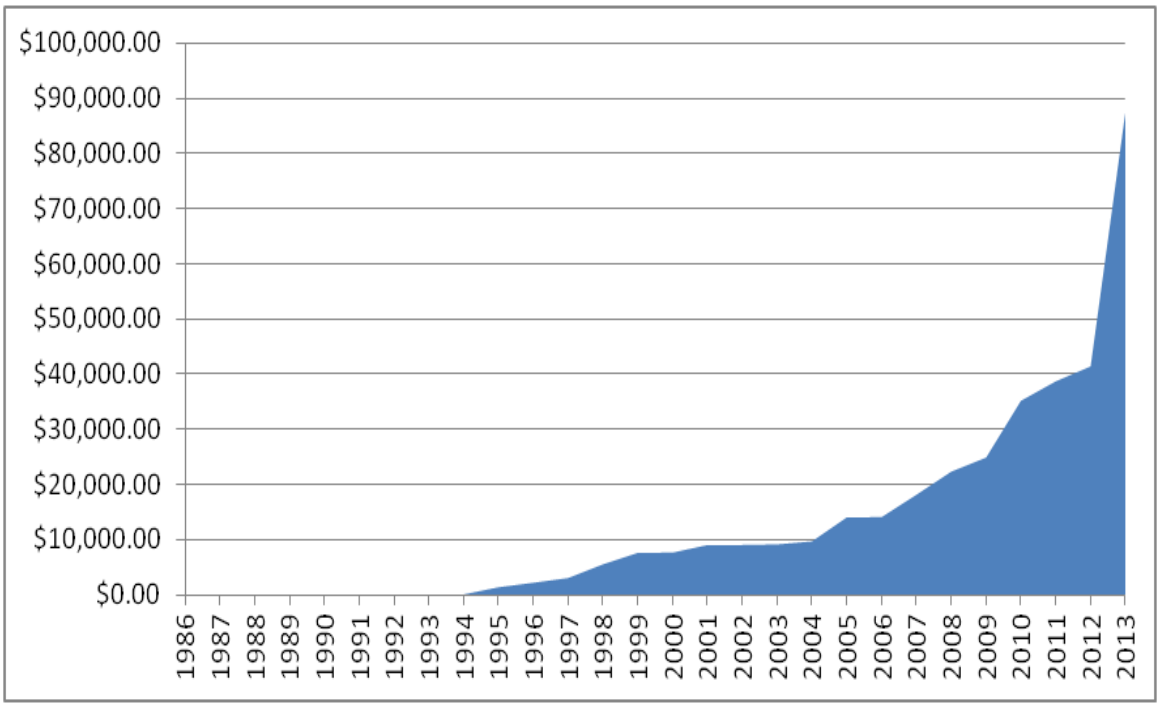

Figure 2.17. Cumulative Value of PPP Projects in Turkey by Year Million USD (adapted from Ministry of Development, 2013).

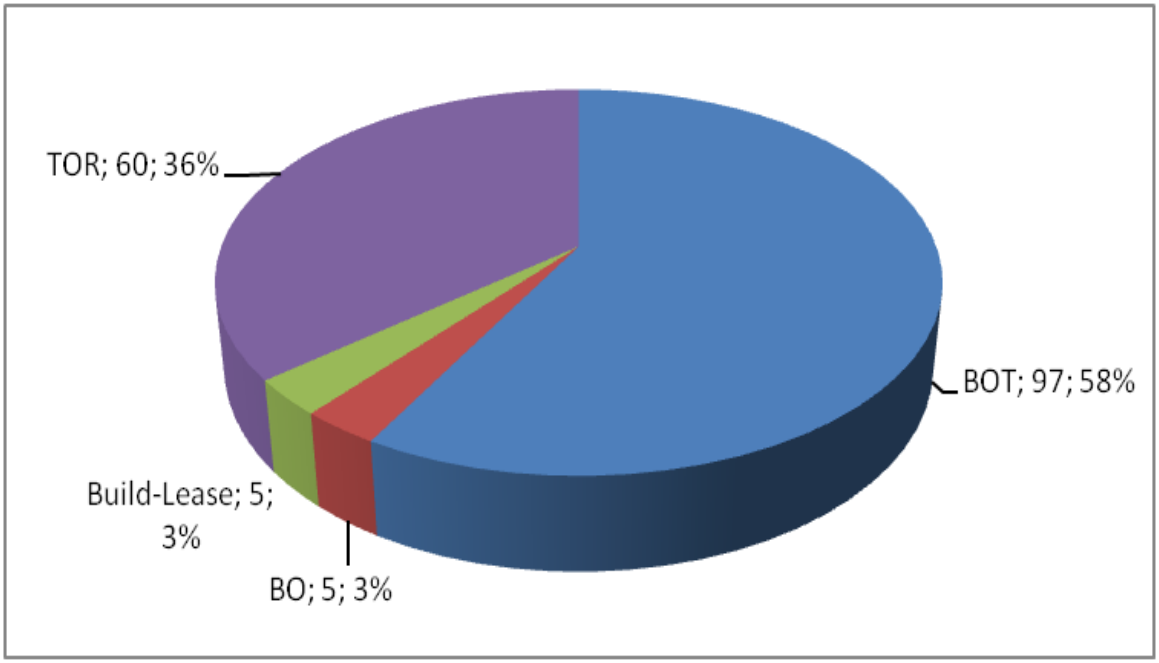

Figure 2.18. Number of PPP Projects in Turkey by Model (adapted from Ministry of Development, 2013).

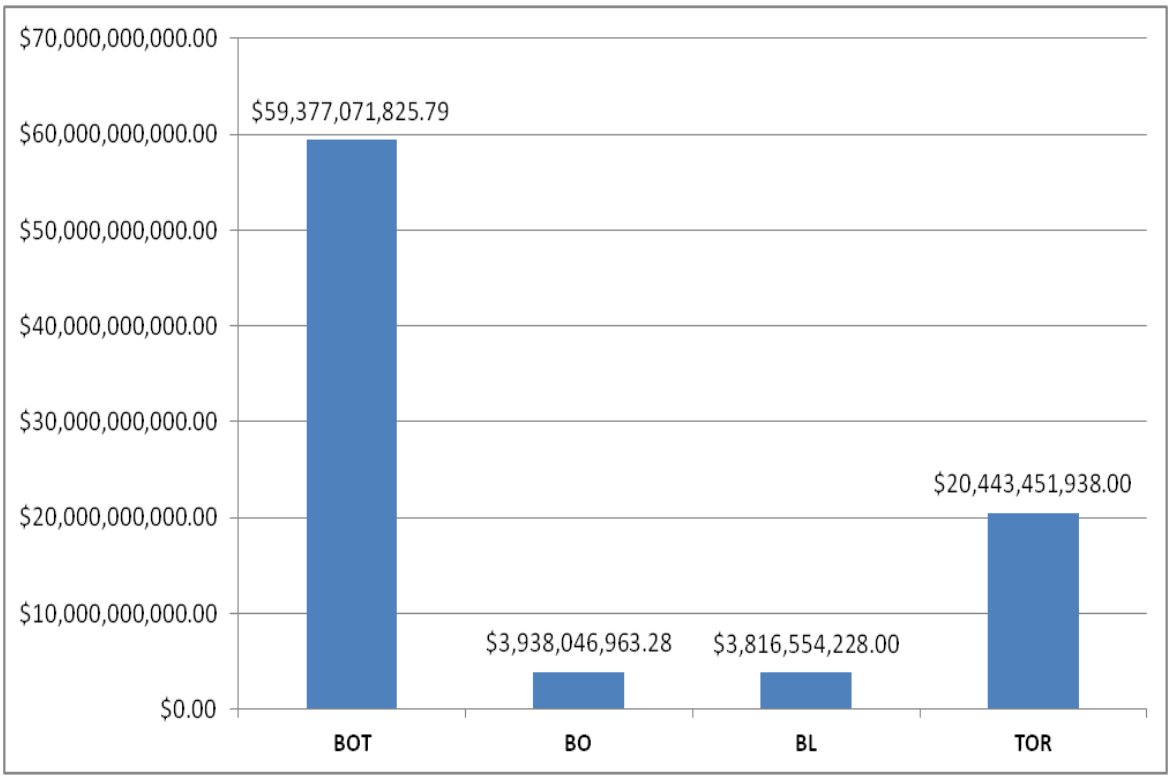

Figure 2.19. Value of PPP Projects in Turkey by Model (adapted from Ministry of Development, 2013).

The size of PPP projects to be tendered is very important to provide funding and to ensure sufficient competition by attracting applicants to the project. Therefore, the average size of PPP projects implemented so far has been examined (Table 18). According to this airport projects with 3.04 billion USD, in front of the hospitals, industrial facilities and urban infrastructure, highway projects, are in the first place. Customs facilities and marinas are areas with the smallest amount (Ministry of Development, 2012).

In another analysis the average investment size of PPP projects in Turkey and the EU were compared. Accordingly, the average size of one PPP project carried out in the EU was € 375 million (H1 2013), while in Turkey it was found to be 365.77 million € (Ministry of Development, 2012).

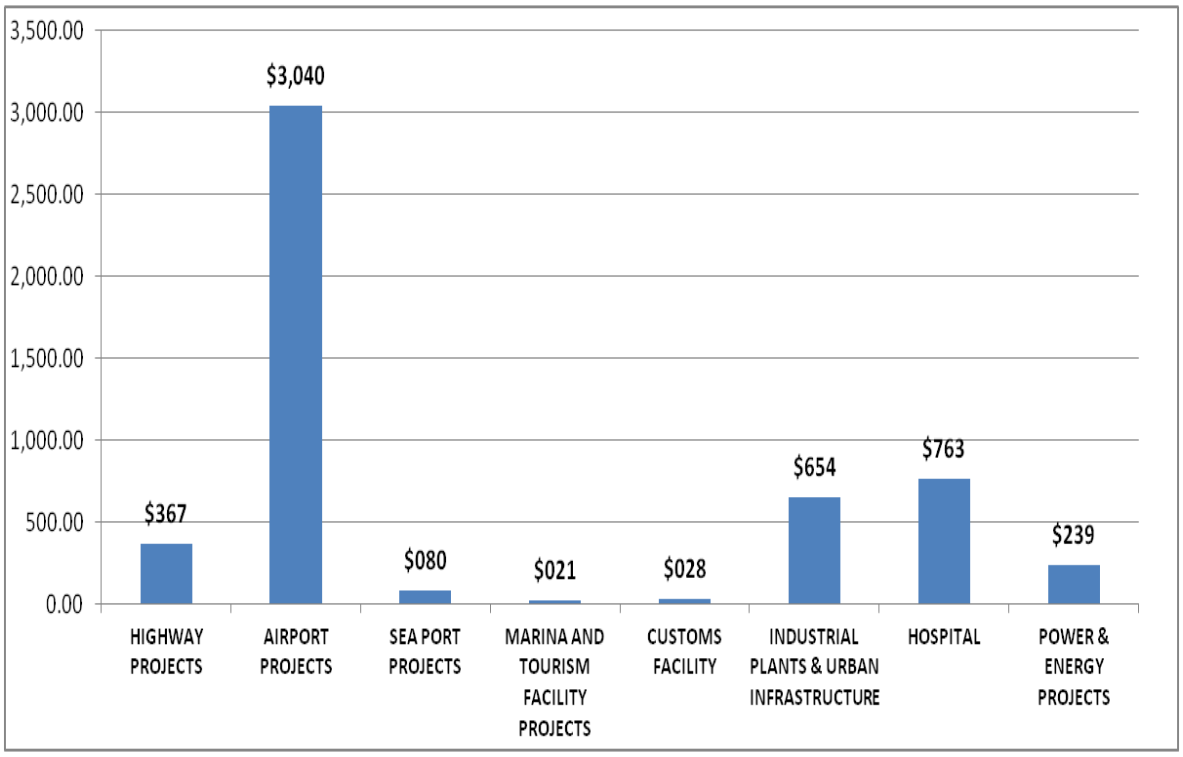

Figure 2.20. Average Value of PPP Projects in Turkey by Model (adapted from Ministry of Development, 2013).

According to Medium-Term Program (2014-2016) prepared by the State Planning Organization (SPO, 2013);

- Investments to be made under public private partnership will be planned taking into consideration the impact on public fiscal balance of liabilities arising from the contract (Article 127).

- Public and private sector investments by taking a holistic perspective in mutually complementary way, public investments will be concentrated in the areas of economic and social infrastructure that cannot be carried out by the private sector (Article 142).

- Operations associated with preparing a strategy document on the implementation of the PPP, collecting the PPP legislation under a framework law, and strengthening PPP policies and coordination of practices will be initiated (Article 147).

Also, PPPs were mentioned in the Tenth Development Plan issued on July 2, 2013 and the following objectives were identified (SPO, 2013);

- In addition to the public resources in order to carry out health investments with public private partnership (PPP) method legal arrangement was made and by this way, especially in large cities, as of May 2013 the construction process has been initiated for about 30 thousand-bed capacity hospital (Article 168).

- In meeting Turkey's growing infrastructure needs besides the use of public resources benefiting from alternative financing models, which will be provided with the participation of the private sector, is needed In this context, in recent years in developed and developing countries PPP models widely used in the implementation of infrastructure investments are used in our country as well. By using Build-Operate-Transfer and Build-Lease model, the number of projects authorized during the Ninth Development Plan period was 46 and total investment amount of these projects reached $ 28.5 billion (Article 581).

- Despite the important arrangements in the PPP legislation, the need for attaining the legislation an integrated structure with framework law continues. PPP process which has a structure that can bring high financial burden spread over many years on the public sector needs to be constructed and managed correctly. Therefore, the need to develop expertise-based institutional capacity of the public institutions in project planning and management process in the field of PPP is important (Article 582).

- In public investments, including those conducted by PPP models, education, health, drinking water and sewerage, science and technology, transport and irrigation sectors will be given priority Article 589).

- In the Tenth Development Plan period, within the investments to be made with public sources, as a result of privatizations and hydroelectric power plants in financial closure level conducted by public, decrease in energy sector's share of;

although having the highest share, due to some of the highways, major ports, airports, train station complex projects will be carried out by the PPP method, decrease in transportation sector's share of; since city hospital and health campus projects will be implemented widely in the PPP method decrease in the health sector’s share of is foreseen (Article 590).

- As the road map for the future a strategy document will be prepared on the PPP implementation and distributed structure of the PPP legislation will be brought together under a framework law (Article 594).

- Co-ordination of PPP policies and practices will be strengthened; an effective monitoring and evaluation system that can measure risks and effects of projects on the budget will be established (Article 595).

- Providing customs services effectively shortens the time in foreign trade and provides a more effective logistics process. Customs gates have been modernized by using PPP method. In parallel to the development of foreign trade, the opening of new customs gates, to continue to the modernization of facilities, and meeting their needs is important (Article 826).

2.3.2. Legal Framework in Turkey

Although establishing PPP is a common and long-standing practice in Turkey and there are different types of models applicable, it is still extremely difficult to make a full categorization regarding the relevant laws and legal arrangements that are in effect (Yilmaz, 2009). In our country, in realization of public investment and services in collaboration with the private sector Build-Operate-Transfer (BOT), Build-Operate (BOO), Build-Lease (BL), Concession, Transfer of Operating Rights (TOR) methods have been applied up to the present. Applications for public and private sector cooperation go back to the Ottoman Empire era and the public service concessions has been granted the legal status with Law No. 576 on Menafii Umumiyeye Müteallik Imtiyazat (Concessions Regarding Public Services) dated June 10, 1326 (1910). The Law of 1910 is still in force and constitutes the legal framework of the public service concession method. Republic period has not applied to the concession, except for a few examples. Public services were

carried out mostly by the state. However, in time with the need to public service the increase in quantity and quality of public services led to insufficiency in resources allocated to investments by the state; deficiencies in use of these resources effectively and since public services cannot be performed at desired quality and level with a classic management understanding the alternative Public - Private Partnerships (PPP) models have been implemented. As you might clearly see from the following chronological list, the rules and conditions pertaining to the Public-Private Sector Partnership models have been regulated separately for each model at the end of 1980s, however, an attempt has been made at a cohesive legal arrangement of various separate models through Law No. 4046 on Privatization Practices dated 24.11.1994. On the other hand, although Public-Private Sector Partnerships are defined as providing of public sector services with the participation of the private sector, it is not possible to evaluate these models entirely within the framework of privatization. Therefore, regulation of Public-Private Sector Partnerships within the framework of the Privatization Law, in some aspects, prevents these models to be efficiently implemented (Yilmaz, 2009). In this context, by making various legal arrangements from the 1980s, public services to be performed by the private sector and different models have been studied. In the legislation relating to PPP models mentioned above updates were made over time during period 2007-2011 legislative changes relating to PPP models can be summarized in chronological order as follows (Ministry of Development, 2012).

(i) Law No. 576 on Concession Regarding Public Services dated 10/06/1910

(ii) 4/12/1984 dated and 3096 numbered "Law on Assignment of Enterprises Other Than Turkish Electricity Administration to Produce, Transmit, Distribute and Trade Electricity" in the energy sector first legal arrangements on BOT model and TOR model have been made.

(iii) After Law no.3096, on motorways and the service facilities construction, maintenance and operation 28.05.1988 dated and 3465 numbered "Law on Assignment of Institutions other than General Directorate of State Highways for Highway (with tolls) Construction, Maintenance and Operation and Regulation", which regulates to be charged of the equity companies that subject to special law

provisions according to the BOT model, was published in the Official Gazette dated 02.06.1988 No. 19830 entered into force.

(iv) In the aim of making the BOT model gain a juristic basis, 3996 numbered "Law on Performance of Certain Investments and Services within the framework of Build-Operate-Transfer" was published in the Official Gazette dated 13/06/1994 No.21959 entered into force. By the added article to Law No.3996 in 2008, "Contribution Margin" in the BOT model was carried into implementation. With this revision, in the BOT models related to investments which the payment of the cost of generated commodity or service completely or partly is not possible by the users, the probability of giving contribution margin to the attendant company from public sector was arranged; however, in accordance with which principles and how the contribution margins to be given did not be stated, so performing the contribution margin was not possible. Thus, Law No. 6111 aimed to provide the practicability of contribution margin by organizing the subject of designating the principles about contribution margin by The Ministry of Development and presenting them to Council of Ministers. The procedures and principles of contribution margin were specified with numbered 2011/1807 "The Decision of the Council of Ministers on the Procedures and Principles of No.3996 Law on Performance of Certain Investments and Services within the framework of Build-Operate-Transfer" which was revised within this context in 2011 and was published in 11/06/2011 dated Official Gazette (Ministry of Development, 2012).

(v) With the numbered 6111 Law published in 25/02/2011 the High Planning Council (HPC) approval stage needed for the BOT implementation contracts before was removed. From now on, administrations will not present "implementation contracts" to HPC approval. Instead, the administrations will present the implementation contracts to the minister whom they are engaged or related. Thus, the double-staged HPC process was reduced to one stage (Ministry of Development, 2012).

In addition, according to the new regulations, administrations for BOT projects without being subject to the Public Procurement Law will be able to receive consultancy

services. Thus, facilitating implementation is intended through preparation of higher quality documents in a shorter period. According to another amendment, usage fee and revenue share for immovable properties belonging to the Treasury or public institutions will not be taken and the authorities that owns related projects will be able to give demand guarantees to private sector. With these changes BOT projects are tried to be make more attractive for the investors (Ministry of Development, 2012).

In this context, the task of public institutions involved in the preparation, evaluation, approval and implementation processes of PPP projects has been redefined. Accordingly have been charged for;

- Ministry of Development; to take measures to ensure project stock is in compliance with development plans, programs, sectorial strategies, to monitor, evaluate the BOT projects and to ensure coordination between the parties,

- Ministry of Finance; by monitoring and evaluating the financial obligations undertaken by public authorities under the central government to ensure public financial liabilities are in compliance with the central government budget,

- Undersecretariat of Treasury; to fulfill businesses and operations related with assessing the risks and their sharing by calculating the likely financial burden of commitments, which are given to the companies in charge by the administration, to public.

- It is indicated that implementing organizations will apply to HPC with "The pre-feasibility study report, which is analyzing the project's feasibility from technical, financial, economic, environmental, social and legal aspects, including anticipated contributions and guarantees includes risk analysis and the sharing and reveals justification of investment’s implementation with BOT model instead of traditional procurement methods with comparative economic and financial analysis" for authorization. Thus, the way of preparation of projects in a more qualified manner is opened (Ministry of Development, 2012).

(vi) 27/11/1994 dated Law No. 4046 Concerning Arrangements for the Implementation of Privatization and Amending Certain Laws and Decrees with the Force of Law Article 18 outlining the methods of privatization regulates the transfer of operating rights.

(vii) In the energy sector, with 96/8269 numbered “The Council of Ministers Decree on Establishment of Electric Power Generation Facility " ,which was published in the 08/06/1996 dated No. 22660 Official Gazette, Build-Operate (BO) model was organized. Law No. 4283 on Establishing and Operating Electric Power Plants and Sale of Energy through the Build-Operate Model by being published in the 07/19/1997 dated Official Gazette No. 23054 entered into force. Within Law No.4283; leaving hydroelectric, geothermal, nuclear power plants and power plants to be run by using other renewable energy sources out of the scope, only for thermal plants, with Build-Operate Model, by granting of permission to production companies, including their own property, for installation and operating facility the principles and procedures on energy sales are regulated.

(viii) With arrangements in 21/04/2005 dated and 5335 numbered The Law on Amending Certain Laws and Decrees Article 33, the airports operated by General Directorate Of State Airports Authority (SAA), the terminals which were built in the Build-Operate-Transfer model framework and operation rights were granted to the private sector, and other necessary facilities by using the leasing and / or transfer of operating right methods specified in Law No. 4046 Concerning Arrangements for the Implementation of Privatization may be delegated to private legal entities for not to exceed 49 years through tender is stated. As a result of arrangements made related to Public-Private Partnership operating time of BOT model was extended, also by specifying places in question may be hired to private legal entities, benefit from the experience of the private sector mainly focuses on management and ensuring execution of public services more effectively and efficiently is aimed.

(ix) By adding an article to "Law No.3359 Health Services Fundamental" in 2005 the legal framework of a new PPP model briefly named in the literature as "Build-

Lease" was created, later with the "Regulation on the construction of health facilities in return for lease and renewal of health facilities in return for management of services and fields except medical service field within the campuses" issued by the Decree of the Council of Ministers in 2006 infrastructure of secondary legislation was completed.

(x) With the added articles to No.351 “Law on Higher Education Credit and Hostels Institution” in 2009 and No.652 “ Decree Law on Organization and Functions of The Ministry of National Education” in 2011 , legal regulation of shortly named “Build-Lease” model is generated in education and student hostel fields as well as implementations in the field of health (Ministry of Development, 2012).

(xi) With the 31/03/2012 dated No.6288 “Law on the Amendment of The Value Added Tax Law, And The Law on The Conduct of Certain Investments and Services Within The Framework of The Build-Operate-Transfer Model, And The Public Procurement Law” while the planned to be performed PPP projects within the Law No.3996 and the Law No.3359 until 2013 were delegated, the subject of leasing the health facilities, which are referred with the construction oriented good and service deliveries within the project of the companies which undertakes the projects, to The Ministry of Health to be exceptional from the value added tax is regulated (Ministry of Development, 2012).

Table 2.5. Legal Regulations in Force in Turkey.

1	Law No. 576 on Concession Regarding Public Services	10.06.1910	TOR
2	Law No. 3096 on Assignment of Enterprise Other Than Turkish Electricity Administration to Produce, Transmit, Distribute and Trade Electricity	04.12.1984	BOT, TOR
3	Law No. 3465 on Assignment of Institutions Other Than General Directorate of State Highways for Highway Construction, Maintenance and Operation and Regulation	28.05.1988	BOT, TOR
4	Law No. 3996 on Performance of Certain Investments and Services within the Framework of BOT	13.06.1994	BOT
5	Law No. 4046 Concerning Arrangements for the Implementation of Privatization and Amending Certain Laws and Decrees with the Force of Law	27.11.1994	TOR

Table 2.5. Legal Regulations in Force in Turkey (Cont.).

6	Decree No. 96/8269 on Establishment of Electric Power Generation Facility	08.06.1996	BO
7	Law No. 4283 on Establishing and Operating Electric Power Plants and Sale of Energy through the Build-Operate Model	19.07.1997	BO
8	Law No. 4749 on Public Finance and Debt Management	28.03.2002	TOR, BO, BOT
9	Law No. 5216 Metropolitan Municipality	10.06.2004	TOR, BO, BOT
10	Law No. 5302 on Special Provincial Administration	22.02.2005	BO, BOT
11	Law No. 5335 on Authorizing the State Airports Authority to Totally or Partially Transfer Its Airports to the Private Sector Through Long Term Leasing or Transfer of Operation Rights Methods	21.04.2005	TOR
12	Law No. 5393 Municipal Law	03.07.2005	TOR, BO, BOT
13	Fundamental Law No. 3359 on Health Services, Article 7 (Law No. 5396) on the Construction of Health Facilities in Return for Lease and te Renovation of Health Facilities in Return for Management of Non-Medical Services and Areas	22.07.2006	BLT
14	Law No. 351 on Higher Education Credit and Hostels Institution	25.11.2010	BLT
15	Law No. 611 Concerning the Restructuring of Certain Receivables, Social Security and the Amendment of the General Health Law and Certain Other Laws and Decrees with the Force of Law	25.02.2011	
16	Decree No. 652 on Organization and Duties of the Ministry of Education with the BLT Model	14.09.2011	BLT
17	Law No. 6288 on the Amendment of the Value Added Tax Law, and the Law on the Conduct of Certain Investments and Services within the Framework of the Build-Operate-Transfer Model, and the Public Procurement Law	31.03.2012	BOT
18	Law No. 6428 on Construction and Renewal of Facilities and Purchasing of Services by the Ministry of Health Through the PPP Model	09.03.2013	BLT

2.3.3. Types of PPP in Turkey

Although there is no cohesive legislation regulating the general rules and framework of PPPs in Turkey, various PPP models have been applied in public service projects since 1980s.The Public-Private Sector Partnership models have been introduced in the system by way of a series of laws. Therefore, it is difficult to make an appropriate categorization among the models, which are in effect under various names. When you are choosing a project to be implemented in relation with a certain investment, the nature of the project and allocation of the anticipated costs, risks and benefits between the public administration and the private sector investor should be taken into consideration.

Primary PPP models are regulated under the Law No. 4046 on Privatization Practices dated 24.11.1994.There are other legislations regulating PPP models as well. Key characteristics of certain models that are currently in use are presented below:

2.3.3.1. Concession. Concession agreements find their roots in Law No. 576 on Concession of Public Services dated 10.06.1910.Concession Agreements allow public administrations to transfer the management of infrastructure or public services to the private sector. While the private sector is operating the public utilities in the name of the public administration, the risk is undertaken by the investor. The service fee to be paid to the public administration is collected by the private sector investor.

Upon expiration/termination of the concession, all assets related with the service in question are directly transferred to the public administration. This method stipulates a public service to be established and operated by a private legal person, which will do so against the fees payable by the users, profits and losses to be incurred by this private legal person.

The general characteristics of this method are as follows:

- Concession agreement is a bilateral agreement
- The subject matter of the concession is establishing and operating a public service

- The private legal person provides the public service in return for the fees paid by the users benefiting from the public service
- The public service is operated by the concessionaire private legal person, the profits and losses to be incurred by the concessionaire in question.

The concession method stipulates that a public service may only be operated by a private legal person if the service in question is under the monopoly of the administration. When the public service concession agreement expires/terminates, all the assets relating this service are automatically transferred to the administration.

Council of State 10th Administration has resolved as follows in its decision dated 29.04.1993 and numbered.

Concession agreements are subject to the assessment of the Council of State. Through Law No. 4446 that came into effect after being promulgated in the Official Gazette dated 14.08.1999, which amended the Constitution, this assessment has been limited to mere expressing of opinion. Disputes arising from these types of agreements shall be subject to the rules of administrative law and shall be settled by the administrative courts, except for those cases where parties have agreed to settle disputes through arbitration.

2.3.3.2. Build-Operate-Transfer. Build-Operate-Transfer (BOT) Model has been introduced in the Turkish legal system through Law No. 3996 on Implementing Investments and Services within the Framework of the Build-Operate-Transfer Model dated 08.06.1994."BOT" is defined as a special finance method where the investment costs (including profits) are paid to the investor in return for the sale of the products and services produced, by the investor. The BOT model is generally applied to projects that require special know-how and generate high costs.

Through legal adjustments recently introduced, Law No. 3996 has acquired a different legal status. Since in article 5 of the Law it has been stipulated that the agreements to be concluded under this law shall be subject to the provisions of private law, it has achieved a partially different status than operation of public services by private legal

persons as regulated under laws no. 3096 and 3465Based on this provision, the administration may, at its sole discretion, specify in concession agreements to be concluded under Law No. 3096 that the agreement shall be subject to private law, and may apply other relevant provisions of Law No. 3996 to the agreement.

There are serious disputes regarding which services would be regulated by which laws and be subject to which regime relating to electricity and highway services, since although Laws No. 3096 and 3465, and Law No. 3966 are headed toward two distinct and opposite directions, there is a close relationship between them when it comes to the services provided under these laws

The issue to be emphasized here is as follows .In Law No. 3996, the build-operate-transfer model is defined as a special finance model. It is without doubt that the Legislator did not use this term accidentally, but is trying to take strategic decisions and indicating where and how the public administration should stand in a competitive environment of a globalizing world. As a matter of fact, the term finance model is an explicit declaration of intent by the legislator that the build-operate-transfer model has a completely different legal and economic status. However, it is also impossible to say, due to the finance model definition that the build-operate-transfer model is different than the models where a public service is operated by private legal persons. At this point it would be reasonable to state that through use of an insensible and chaotic method, the "legislator's intent" was deliberately kept clear of creating transparent models that aim to serve the public in the process during which concession, build-operate-transfer and privatization models are shaped to reach their current status.

As of the date the Law has come into effect, the structure of the Law, which led to disputes, and the process of its evolution can be summarized as follows:

- The Law, even at the time it came into effect in 1994, was stipulating a legal structure unlike the concession method. Therefore, pursuant to the initial regulation of article 5 of the Law, the scope of the law has been defined as "services that do not constitute a public service", where it was stipulated that these services should

be subject to private law. The Legislator has thus aimed that the agreements to be concluded on the basis of this Law would be left outside the scope of Council of State assessment. However, through the decision of the Constitutional Court No. 1994/71 E. 1995/23 K. dated 28.06.1995, the relevant sentence of article 5 of the Law has been rescinded on the grounds that it is in breach of the Constitution to subject the agreements that basically have the nature of an administrative agreement to provisions of private law.

- Upon this decision of the Constitutional Court, articles 47 and 125 have been amended through Law No. 4446 dated 13.08.1999.

Article 47/4;

"The issue regarding which of the investments and services provided by the State, public economic enterprises and other public legal persons may be commissioned or transferred to real and legal persons through private law agreements shall be established by law."

"It might be stipulated in the concession contracts and agreements related with public services that the disputes arising thereof would be settled through national and international arbitration. International arbitration is only applicable for disputes involving an international element."

- The Legislator has amended article 5 of Law No. 3996 again through Law No. 4493 dated 20.12.1999 following establishment of its Constitutional authorities in the aforementioned manner and has stipulated that the agreements to be concluded pursuant to this law are private law agreements.

"The agreements to be concluded between the administration commissioned by the Supreme Planning Board and a capital company or a foreign company shall be subject to the provisions of private law."

- Through Law No. 4492 dated 18.12.1999, the concession agreements for which an arbitration model has been stipulated in the Council of State Law No. 4577 dated 02.06.2000 and Administrative Jurisdiction Procedures Law have been left outside the jurisdiction of the Council of State and Administrative Courts.

- Law No. 4501 on Principles to be observed in Settlement of Disputes Arising from Concession Contracts and Agreements Related with Public Services through Arbitration dated 21.01.2000 was promulgated.

"The purpose of this Law is to determine the principles and procedures to be observed by the parties at the time the agreement is executed, if it has been stipulated in the concession contracts and agreements related with public services that any disputes arising thereof shall be settled by way of arbitration."

Under such circumstances, it has been stipulated that "build-operate-transfer" agreements, which are subject to private law and disputes arising thereof would be settled through arbitration, are considered to be drawn up within the framework of Law No. 3996 and executed under Laws No. 3096 and 3465 would be, as a general rule, subject to administrative law; but in cases where the administration deems necessary they shall be subject to private law.

2.3.3.3. Build-Operate. This model has an exclusive scope regarding building and operation of power plants owned by investors.

In this model the investors obtain the right to build and operate thermal power plants only. Hydroelectric power plants, geothermal and nuclear power plants, as well as all other power plants running on renewable energy sources are excluded from the scope of this law. Since this model is limited to a certain subject, it has been applied in a limited number of projects in Turkey.

Agreements signed according to this model under Law No. 4283 are regulated through the private law rules and any dispute arising thereof may be settled through international and/or national arbitration.

2.3.3.4. Build-Lease-Transfer. The Build-Lease-Transfer Model has been established in our system through an amendment introduced in the Fundamental Law on Health Services in 2005 and is applied in conjunction with only health services. The Ministry of Health allows investors to build health premises on public immovables to be later leased by the Ministry.

All services other than health services are provided by the private sector in relation with the premises in question. Based on the nature of the facilities, if the investor is also providing operating services, then this issue is taken into consideration at determination of the lease value.

Since there is no special regulation regarding applicable law and court of jurisdiction, the agreements discussed within the scope of this model are agreements subject to public law and the administrative courts are the courts of jurisdiction.

2.3.3.5. Transfer of Operating Rights. Within the scope of this model, the administration transfers its operating rights to private investors for a certain period and under certain conditions. This model is regulated through Law No. 4046 on Privatization Procedures that introduces general definitions on this method, as well as Law No. 3096 on Authorization of Enterprises Other than the Turkish Electricity Institution to Produce, Transmit, Distribute and Trade Electricity dated 04.12.1984.

In this method the proprietary rights are not transferred, but only the operating rights of a certain service are granted to the private sector.

Pursuant to provisions of Law No. 4046, the Privatization Administration will be free to apply other methods in accordance with the aspects of the public service and requirements of the project.

3. LITERATURE REVIEW

This chapter addresses answers to the following question:

(i) What is meant by Procurement of Capital Projects?
(ii) What is a PPP project?
(iii) What is meant by Critical Success Factors?
(iv) What Critical Success Factors have been identified in previous research work about procurement of PPP projects?

3.1. Procurement of Capital Projects

Office of Nebraska Government (1994) defined capital projects as projects that use taxes specified by legislation and including any proposed new infrastructure, any proposed addition, renovation or remodeling of a capital structure, and any proposed acquisition of a capital structure by gift or purchase.

Pricewaterhouse Coopers (2004) also defines capital project as projects that include state funds or improvements and in addition to these, construction and initial equipment, reconstruction, significant demolition, major alteration of any capital asset and major maintenance projects on assets that are state owned or used for state government purposes. However, capital project does not include: preventive maintenance consisting of normal upkeep or repairs to keep capital assets and their fixtures in their present condition or state of usefulness. Capital projects are the important cornerstone of economic development and contain substantial risk (Pricewaterhouse Coopers, 2004).

The macroeconomic crisis in the 1970s and 1980s led to change initially in the way of traditional public facilities procurement due to concerns about the level of public debt. Governments search for encouraging private involvement in developing capital projects initially on the basis of accounting fallacies arising from the fact that public accounts did not distinguish between recurrent and capital expenditure. Interest in the public projects remained quite low in the past years (Amponsah, 2010).

Love *et al.* (1998) provide standard business definition of procurement as "to obtain a good or service". They suggest that successfully delivered procurement means "right good or service at the right time and for the right price". Sometimes, procurement is just repeatedly purchasing the same thing or making a one-time purchase or acquisition, but in the business world, procurement may go beyond these tasks. Well implemented business procurement can sometimes imply negotiation deals with long-term suppliers. There are two main procurement types: direct procurement and indirect procurement. According to Amponsah (2010) direct procurement refers to acquiring raw goods and materials while indirect procurement refers to the acquiring capital goods and services, maintenance and repair. Contrary to the indirect procurement, direct procurement is production-related (Amponsah, 2010).

Procurement also means the whole-of-life cycle process of possession from third parties encompassing goods, services and construction products, from initial concept through to the end of a services contract or the functional life of an asset, including removal. Delivery of needed services in government procurement through PPP covers creating, financing and owning any necessary new infrastructure and in essence the government is paying for a service, not an asset (Amponsah, 2010).

The procurement method chosen for the capital project varies depending on the project, size and complexity and the most widely used methods can be grouped under the headings as follow: traditional, integrated or management (Love *et al.*, 1998). In traditional systems, the project process is separate and sequential (construction follows design and tender) which is the oldest form of construction procurement (Moore, 2002). In an alternative integrated system noted by Al Khalil (2002), an organization is responsible for design and construction of the project and the client involves the process at one point. The best-known examples of procurement models are design and build, built-operate-transfer (BOT), built-operate-own transfer (BOOT), turnkey and package deal. The last one is the management approach in which the construction manager (CM) or project manager’s (PM) role is to look after the project objectives in the organization (Amponsah, 2010).

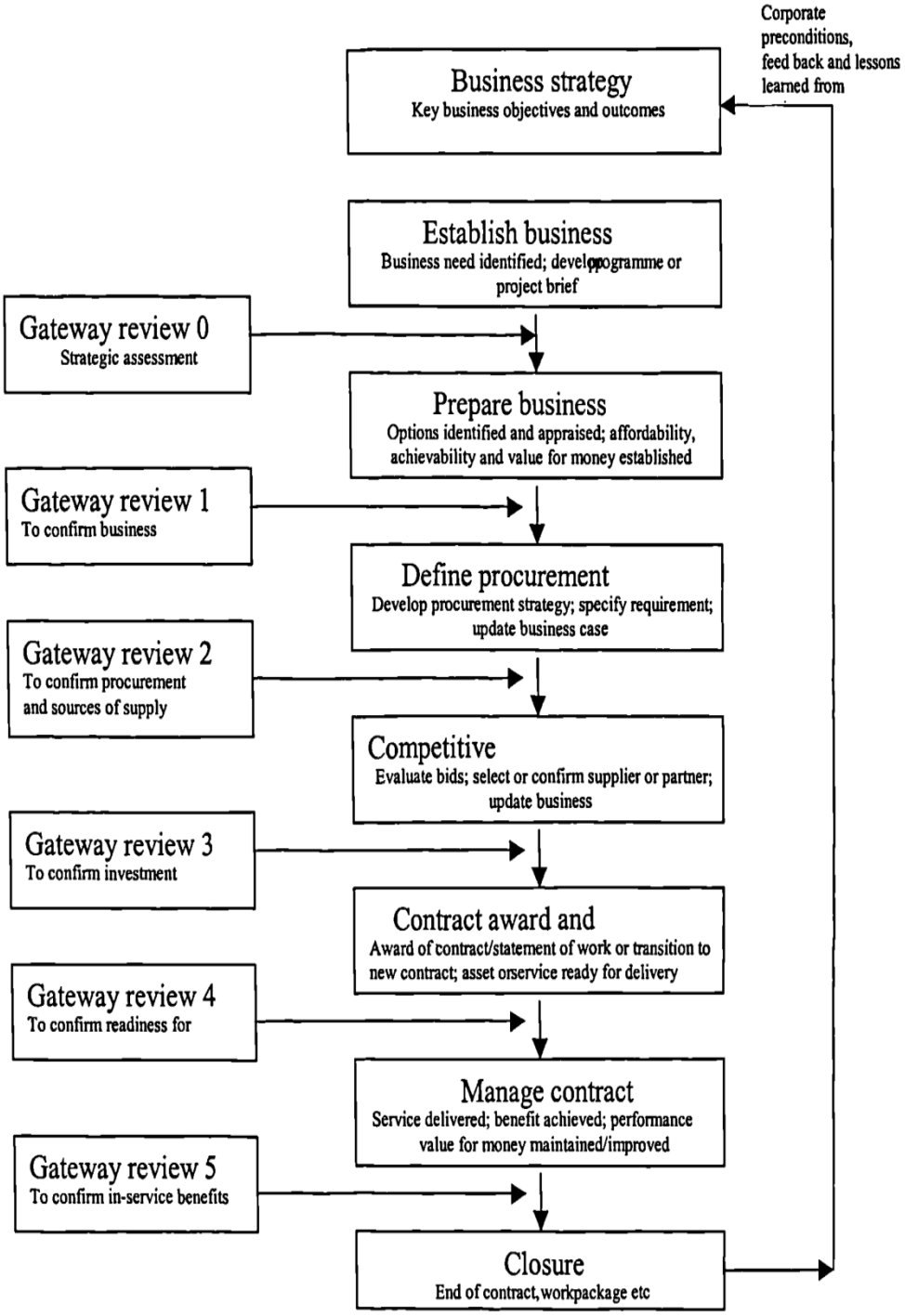

Figure 3.1. Public Procurement Process and Review (OGC, 2001).

Many construction projects are generally undertaken using the traditional procurement system (Masterman, 2002). Recently, the alterations in the construction industry like construction techniques have led differentiation in construction processes and changes in organizational structures to meet a variety of clients' objectives (Love *et al.*,

1998). As a result many integrated and collaborative procurement systems are emerged. Sanvido and Konchar (1999) and Walker (2002) comment on the relationships of the parties to the project. As Walker (2002) points out, "…for the purpose of accomplishing a construction project an organization can be said to be the pattern of interrelationships, authority and responsibility that is established between the contributors to achieve the construction clients' objective". Therefore the method where the contributors are organized to use their skills effectively is essential to the management of a construction project. One of such management practices is the Public-Private partnership concepts.

The Partnership mechanism combines the public and private sector to go through the whole procurement process. A typical PPP project generally passes through five phases: planning, implementation, construction, operation and transfer (Mustafa, 1999). The phases involved determine the degree of responsibility of the public and private sector (Figure 3.2). It is possible to bring the private sector into the planning phase; however, the private sector takes on more project risks when engaged at an earlier stage (Jones et al, 1996).

In the planning phase of a PPP project the government agency announces the need for a project; identifies the types, quantities, and quality of services and related resources to be provided; examines the market; prepares an draft plan; gets consulting service; decides procurement type; constitutes project team. The second phase is implementation in which the private sector developer arranges a comprehensive feasibility study and makes his best offer to the public agency. A series of negotiations are held between the public and private participants. Basically, the winner bidder is determined according to economically advantageous proposal which provides most value for money (Li, 2003).

In a tender consortium there must be an operator who takes responsibility for delivering the necessary services indicated by the client and performing the periodic maintenance with minimum interruption in operations. At the end of the specific concession period the ownership of the possession turns back to the public entity. The government then carries out new tendering to start another new operation contract (Li, 2003).

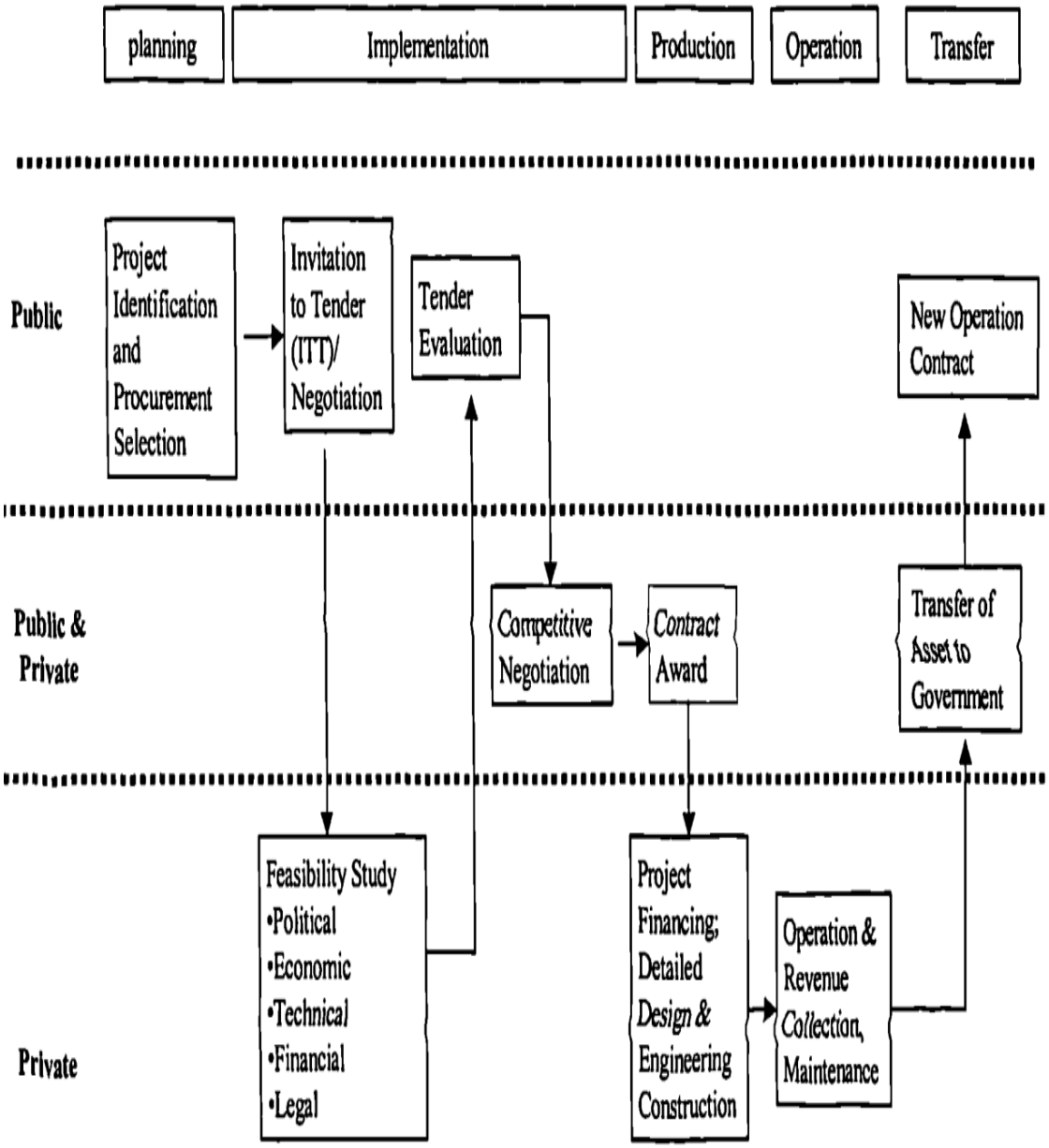

Figure 3.2. PPP Project Development Process (Mustafa, 1999).

In addition to lessons learned from case studies (James *et al.*, 2005), researchers have suggested the advantages of various aspects of PPPs, which include:

- Enhanced partnership between the public sector and the private sector (Erridge and Greer, 2002; Ysa, 2007; Zhang and Kunaraswamy, 2001a; Zhang *et al.*, 2002; Zhang, 2004a, b).

- Better risk management (Grimsey and Lewis, 2002; Li *et al.*, 2005a; Shen *et al.*, 2006).
- Clearer government policies (Ball and Maginn, 2005; Hart, 2003).
- Revealed critical success factors (Li *et al.*, 2005b).
- Improved maturation of contract (Ho, 2006; Tranfield *et al.*, 2005).
- More appropriate financial analysis (Akintoye *et al.*, 2003a,b; Norwood and Mansfield, 1999; Huang and Chou, 2006; Saunders, 1998).

One of the substantial benefits of PPP approach is enabling the governments to save their resources in several ways. In this manner, the government can focus on its core competencies and does not need to spend its own assets for the projects which it has not experienced before (Cumming, 2007). The expanding involvement of private sector in capital projects allows for more efficient use of government assets, data and intellectual knowledge, which leads to considerable enhancement in the quality of public facilities and services (Edkins and Smyth, 2006). Nonetheless, proper use of the private partner's skills, experience, technology and innovation may provide more satisfactory public service delivery. The other benefit of the partnership between public and private sectors is risk allocation at different phases since the private sector brings commercial disciplines into public projects, the risk of cost overruns and project delays can be significantly reduced (Shen *et al.*, 2006; Li and Akintoye, 2003; Ho, 2006). In completing the whole design, build, and operation process with PPP, the private sector participation may be useful to make a leaner civil service structure with a more efficient hierarchy of responsibility for services delivery (EU, 2005a).

Besides the benefits for resource saving and more efficient use of them, carrying out PPP projects in the delivery of public services has also advantage for improving the economic features. For instance, it is obvious that PPP leads to the reduction of lifecycle costs (Li and Akintoye, 2003), as these projects extend government capital investment over the life of a project. This guarantees the expected rate of return for governmental investment (Tang *et al.*, 2010).

It has been noted by the practitioners that there are still political obstacles in the way of performing PPPs and as it is expected, a special legislation is always needed for the PPP projects (Algarni *et al.*, 2007; Tang *et al.*, 2010).

3.2. Public Private Partnership (PPP) Projects

PPP has become popular in the construction industry due to alliance of public and private sectors could solve many problems involved in construction investment. The significant privatization and deregulation measures adopted by the public sector have led increase in the trend of construction works being carried out by the private sector in telecommunication, power, transport, water, energy, petrochemical and sanitation sector (Raflery et al, 1998).

Compared to traditional methods construction PPP projects raise many different issues. The significant changes remain in the areas of procurement system, contract structure, financial mechanism, revenue scheme and risk allocation.

Akintoye and Li (2003) define PPPs as a long-term contractual arrangement between a public sector agency and a private sector concern, whereby resources and risk are shared for developing public infrastructure. In a PPP project the public sector especially aims to achieve value for money in the provided services by ensuring that the private sector entities meet their contractual obligations properly and efficiently (Grimsey and Lewis, 2004).

Traditionally, private sector participation has been limited to separate planning, design or construction contracts on a fee for service basis – based on the public agency‘s specifications. PPP is a way of public sector procurement using private sector finance and best practice. PPPs which are privately financed and operated on the basis of revenues received for the delivery of the facility and/or services can involve design, construction, financing, operation and maintenance of public infrastructure and facilities, or operating services to meet public needs. According to National Council for Public-Private Partnership (2003) the key factor is the ability of the private sector to provide more

favorable long term financing options to a government entity and to secure the financing in a much quicker time frame. Such contracts are long-term and usually 25-30 years.

Growing private sector involvement in capital projects allows the public agencies to take advantage of private sector's technical, managerial and financial resources and know-how in new ways to reach some objectives such as greater cost and schedule certainty, supplementing in-house staff, innovative technology applications, specialized expertise or access to private capital. Besides from the private sector's aspect, the private partner has an opportunity to expand its business in return for the new or expanded responsibilities and risks.

As noted by Mustafa (1999), PPPs concentrate on the common faults that are relevant to public sector procurement and some of well-known examples are as follow: high construction costs, construction overruns, operational inefficiencies, poor design, and community dissatisfaction. The PPP idea is based on transfer of project risks from public sector to private sector consortium who can manage the risk best is appealing to the government and one of the key elements of the approach even though this requires a profit incentive to the project consortium (Grimsey and Lewis, 2004). The concept requires contracted parties to assume the risk that lies with the party who is in most control. It is a strategy that is considered as covering the lifecycle cost effectiveness concept. In this concept the entity proposing the design solution declares that takes the responsibility of maintaining and operating the facility thus this circumstance leads the motivation to reduce long-term costs and develop a highly cost-effective product (Walker and Hampson, 2003).

Transportation PPPs were first initiated in Europe and by the 1990s, two types of partnership approaches had developed. The first one is "real toll" scenario, which is commonly used, in which private concessionaires organize financing, construct roadways, maintain them, service their debts, and derive revenue from tolls collected directly from drivers. Enabling governments to make use of sources of private capital and circumvent using public taxes for constructing highways is one of the main benefits of the "real toll" concession approach. First examples of real toll PPP was recognized in France and Spain then replicated in such diverse locations as Iceland, Malaysia, South Africa, Croatia, Australia, China and Brazil. Furthermore, wide range of countries is now prepared to

launch assertive transport partnership projects, including Poland, Romania, Lebanon, Egypt, and Austria (Amponsah, 2010).

Since PPPs have become more common, many governments are willing to tap into the expanding efficiencies of the private sector and have observed that private developers deliver greater value for money. This has resulted to the "shadow toll" approach initially adopted in the United Kingdom, where governments award concessions to build-operate-maintain toll-free highways and then compensate the investors based on roadway usage and/or availability of those facilities. Privately financed shadow toll highways are widely implemented in the United Kingdom, Finland, Spain and Portugal (Amponsah, 2010).

Even though the role of private sector in highway construction, operation and finance decreased in the mid of the 20th century, previously in the United States the private sector had played a key role. However, in the late 1980's private-sector involvement in these cases re-emerged; moreover, as the need for highly efficient surface transportation systems continue to expand and state fund is quite limited, the private involvement will continue to increase. As in the other countries, transportation officials in the United States have searched for new ways to reach desired efficiency level and value for money that the private sector can provide. Thus, public will has resulted to new forms of partnership between public and private sectors. Thorough this partnership contract, public entity have transferred responsibility of activities, to the private sector unlike traditional method (Hess and Lombardi, 2004).

A number of the primary reasons for public sector to involve in public-private partnerships are accelerating the implementation of high priority projects, provide specialized management capacity for large and complex programs for private partner, enabling the delivery of new technology developed by private entities, drawing on private sector expertise in accessing and organizing the widest range of private sector financial resources, encouraging private entrepreneurs. Some of typical procurement packages under the PPP offering include build-operate-transfer (BOT), design-build finance-operate-transfer (DBFO), build-lease (BL), which are commonly used in worldwide.

3.2.1. PPP Models in Construction Industry

The PPP approach widely accepted by governments substantially depends on government objectives, and the level of private sector participation and related ecology. In Turkey using BOT method in the delivery of public services is very popular. Gentry and Fernandez (1997 cited in Li, 2003) argued that the decision to enter PPPs in environmental development is dependent on

- Degree of control desired by the government
- Capacity of governments and private parties to provide the desired services
- Legal frameworks for private investment and regulatory oversight
- Availability of financial resources from public or private sources.

Figure 3.3 shows the structure of PPP models developed for a construction projects. In this sketch, the left blocks represent the provision contents associated with the features of public facilities. As seen in the sketch, the level of private sector involvement in public facilities increases from the bottom to the top. The bottom block is purely associated with services provision by the private sectors using their assets. Up a block, the private companies could use the public facilities to provide their services. The top block is "public facility" ownership that the private sector can access by partial ownership, short-term ownership or long-term ownership.

The right blocks identify the left blocks' concept in the construction industry. Six dimensions - design, construction, maintenance, operation, financing and ownership – are used to describe PPP approaches. In PPP concept the private party undertakes the project, including design, construction and maintenance are typical service provision activities, with their own resources. The central blocks are proposed PPP models for construction project development. There are five levels of private involvement, namely service contract, leasing, joint ventures, concession and privatization and those five models are discussed in detail.

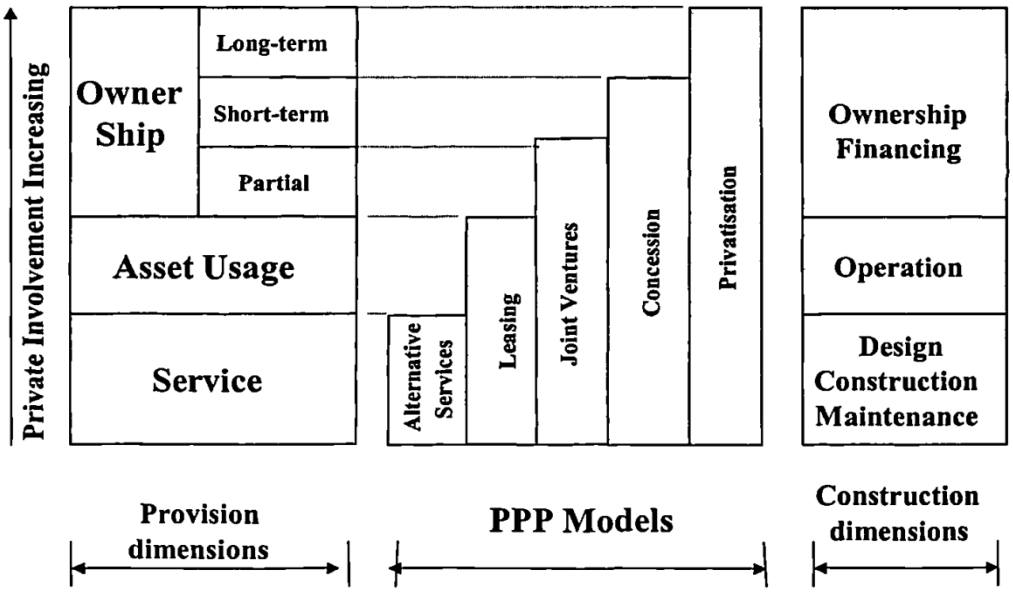

Figure 3.3. PPP Models in the Construction Industry (Li, 2003).

3.2.1.1. Alternative Service Contract. Many researchers, such as Batley (1996), Stonehouse et al (1996), Gidman et al (1998) and Sindane (2000) have documented that alternative service contract or contract management is the simplest way of partnership. In this model, the private sector makes the least contribution to the design and construction elements so private contractors ensure better design and savings in time for public services. Batley (1996) has argued that design-build, contract management and turnkey arrangements, for which contractors are in charge of design and construction activities, are the most popular forms of Alternative Service Contract method in a PPP construction project. Private contractors usually receive payment according to contract and not according to their own operational efficiency.

3.2.1.2. Leasing Based Contract. Private contractors can use leasing option to use public facilities to provide their services. It can be in the form of finance lease and operating lease (Thompson, 1996). In a lease arrangement, the contractor leases the assets from the public sector, such as a water treatment facility, and pays a rental fee. The contractor is paying for the operating, repair, and maintenance costs of those assets and collecting the fee from service consumers. Usually, the contractor is not responsible for making any new capital investments or for replacement of the leased assets.

3.2.1.3. Joint Ventures. Joint venture approach in which the foreign investor forms a joint venture with an agency of the host government is normally integrated into a concession. The government takes a share in the project company by contributing land, resources or local currency. The investor must guarantee to raise and remain required capital funds for building and operating the project. The investor may also search for other firms or banks as investors and lenders to sign partnership contract for project finance. Under this arrangement, all parties agree to share all losses or profits in proportions based on the equity contributions of the shareholders (Li, 2003).

3.2.1.4. Concession Contract.In concession contracts the ownership time is limited (complete ownership) and vary from a couple of years up to 40 years or more. The government grants the private company a concession to design, build, manage, operate and finance the project. This category includes the most widely used concession contracts, such as Build-Operate-Transfer (BOT), Build-Own-Operate-Transfer (BOOT), Build-Own-Operate (BOO), Private Finance Initiative (PFI), Design-Build-Finance-Operation (DBFO), and Design-Construct-Manage-Finance (DCMF) etc.

The concessionaires are the service providers who finance, design and build a new service facility, or substantially improve an existing one. In this context service provider holds the ownership of the completed facility and operates, maintains and repairs it, collects charges and tariffs from users, and pays the government a concession fee that varies with revenues or profits for the duration of the contract, which is typically 20-25 years. Some of the well-known examples of concession contract are discussed in the following section.

HM (1995) claimed that a DBFO (Design-Build-Finance-Operate) initiative was launched in 1994 under the UK Department of Transport's DBFO road proposal in which the transfer of the asset to the public sector at the end of the contract may or may not be included.

Figure 3.4 shows a typical structure and the parties involved in a DBFO contract. The Highway Agency assigns the project development, including design, construction operation, and finance, to a specified DBFO Company. The DBFO Company then divides the contract into two parts between a Construction Company and an Operation Company,

but keeps the responsibility to finance through equity or debt. The toll fee is later collected by the DBFO Company for the return of the investment and operation cost. Hawwash and Barnes (1997) stated that this responsibility allows both parties to make change. The public authority can change the requirement, while the concessionaire can suggest changes under the review procedure.

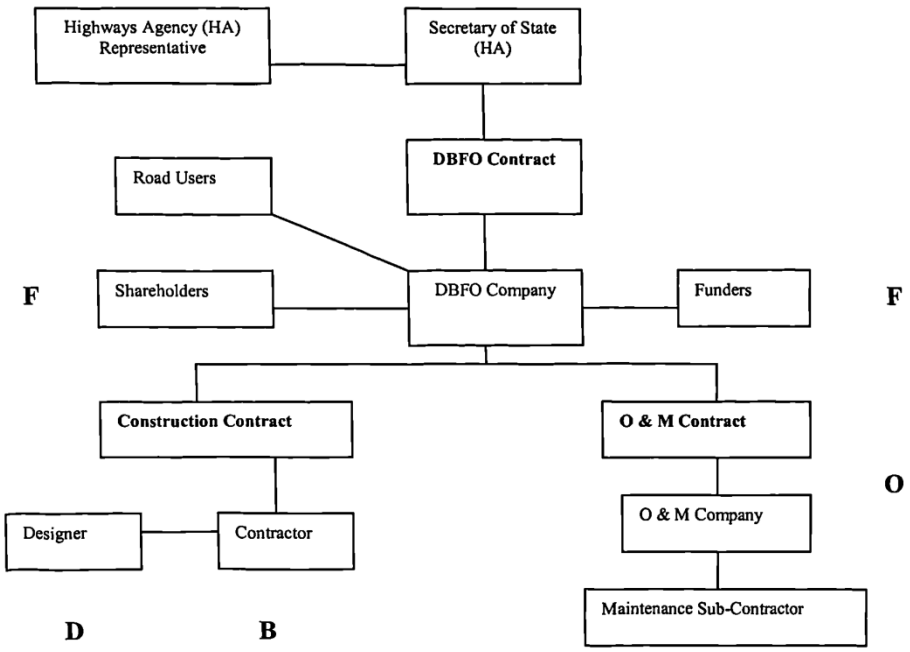

Figure 3.4. A Typical DBFO Project Organizational Structure (Hawwash and Barnes, 1997).

The term DCMF (Design-Construct-Manage-Finance) was used in the UK for PFI prison projects and involves asset transfer (HM, 1995). There is a considerable transfer of risk to the private sector; both through the design, planning and construction phase, and in operation through a combination of payment mechanisms and specific contract conditions.

The private sector operator is paid a daily rate for facility made available, hence no payment is made until the prison is up and running. The DCMF contracts typically are for a period of 25 years. However, in DCMF the important thing is that payment is strongly connected with management performance (TTF, 2000).

The DCMF could provide flexibility in contract compared with traditional procurement measures. According to Sandberg (1998) a long-term contract should be prepared by taking into the consideration potential changes in the needs of the parties, incidents within or beyond the control of the parties, for the purpose of protecting the original level of benefit/cost of both parties.

The BOT (Build-Operate-Transfer)/ BOOT (Build-Own-Operate-Transfer) model is a method that allows a project company established to plan, finance, design, construct and operate the facility with a contract for a certain period of time before the ownership is transferred to the host government again (Finnerty, 1996). In some studies, researchers have argued that the BOT and the BOOT models are the same since both of them involve every phase of design, build, finance, operation, and transfer. As noted by Stein (1994) the BOT approach is mainly aiming to substitute governmental responsibility for implementation of a given project thorough the private sector investors' initiatives; to sum up, transferring the responsibility temporarily, or permanently for definite services or operations from the public sector to private sector.

BOT method is considered as a way of cutting back the public expanse and borrowing, attracting foreign investors in their countries' infrastructure or industrial projects as well, the idea instantly captured the world's attention accordingly, particularly in developing countries such as Malaysia and Thailand (Tiong, 1992). The BOT method was first coined in 1984 in Turkey by the Turkish Prime Minister, Turgut Özal, as a part of the privatization of Turkey's public sector projects. According to Naresimhan (1998), the BOT concept in India is a blend of the US "toll road" and the European "concessions" — the government keeps the ownership of physical asset and the BOT concessionaire finances and collects the operating revenues during the contract period.

The advantage of the BOT/BOOT structure, which is shown in Figure 3.5, for host government is the reversion of ownership (Finnerty, 1996). This model is commonly applied for transportation infrastructure, energy, and environmental projects. In BOT concept, the governments participate in the concession agreement with their regulatory company which is in charge of constructing, operating and taking operating revenues during the concession period. If a required know-how is not available in the consortium

members, the project will be undertaken by hiring contractors and operators thorough sub-contracting (Woodward, 1995).

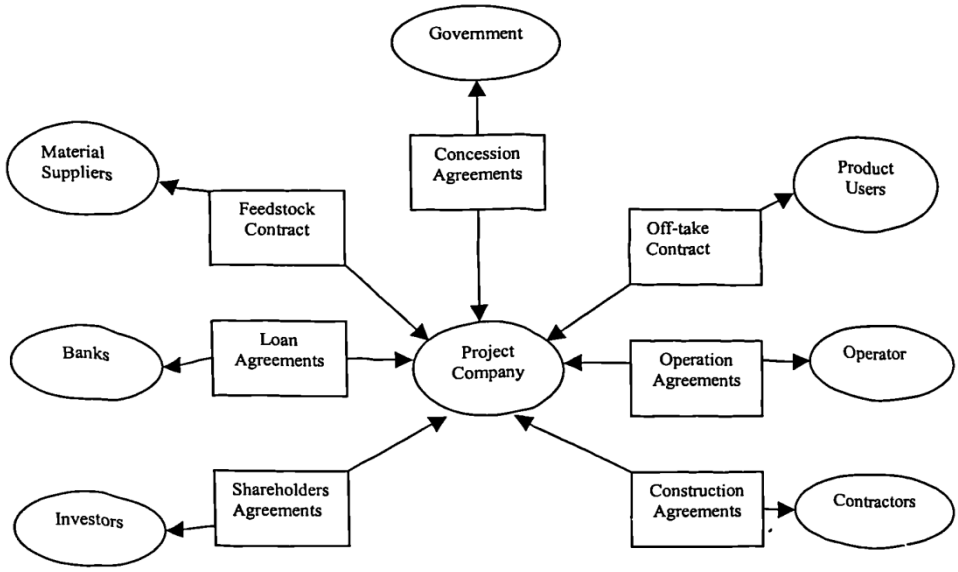

Figure 3.5. Structure of BOT/BOOT Contrast (McCarthy and Tong, 1991).

The BOT/BOOT concept differs from more conventional approaches mainly in having only the project's expected cash flows as a resource to indicate the economic viability from the lender's point of view. The project owner has the responsibility for assuming not only the role of borrower but also their financial advisers, structuring the financial package to make it more attractive for potential lenders, while at the same time providing as little option as possible to themselves if things go wrong (Woodward, 1995).

The absence of the ownership may create some serious financial problems in raising the resources for operators. As the operators need some financial securities, they may want to mortgage the assets but since the asset belongs to the project owner, it cannot be done in this approach (Li, 2003). Bennett (1998) summarized the potential strengths and weaknesses of BOT in developing countries as follows:

Potential strengths:

- BOT is a useful tool to bring private money into the construction of new infrastructure facilities, or into the extensive renovation of existing ones.

- BOT contracts are likely decrease market and credit risks for the private sector, as the government is the only customer, reducing the risks relevant to insufficient demand and ability to pay. Without a government guaranty provided for private sector, the private sector partners will avoid BOT arrangements, as they are not sure that the private sector investment will be paid back.

- The BOT concept has been applied in building new power plants in many developing countries. This history means that potential financial partners and operators have less of a learning curve to climb in structuring such transactions in the water sectors, which often increases their appeal to the private sector.

Potential weaknesses:

- In BOT projects, the private sector actor's ability to help optimize system-wide resources or efficiencies is limited since this approach generally includes only one facility. On the other hand, BOTs can provide a platform for increasing local capacity to operate infrastructure facilities.

- BOTs provide some competitive incentives for efficiency, since private companies must compete to win the contracts. The length and complexity of BOTs are the handicap of this approach that makes these contracts difficult to design; a fact that often negates the positive effects of the initial competition. For example, most BOTs have to be renegotiated once they are underway and these negotiations are essentially conducted without competition.

In BTO (Build-Transfer-Operate), design, finance, and building responsibility is assigned to the private entities and after the project facility passes its completion tests the legal title is transferred to the host government immediately. The private entities then lease the project facility back from the public authority for a fixed term which allows private entities to operate the project facility and to collect revenues for its own account during the

term of lease. At the end of the term of lease, the public authority operates the project facility itself, or hires someone else to operate it (Finnerty, 1996).

In a BBO (Buy-Build-Operate) contract, a private company buys an existing facility from the host government, modernizes or expands it, and operates it as a regulated profit-making public-use facility. Li (2003) stated that this model may be popular and most appropriate in developed countries for under-developed, congested roads, bridges, and airports because of the many existing public facilities that require repair or expansion.

From the public agency's point of view, in BOO (Build-Own-Operate) increasing the role of the private sector propose many benefits regarding specific project needs. Projects are expected to take advantage from PPPs when tight schedules, complex design and construction or innovative finance are involved (Amponsah, 2010).

A BOO contract is based on the partnership between the public and private where a private company may build, own and operate a facility which serves to general public under a turnkey contract. As noted by Kopp (1997) it is argued that the BOO concession method is a much simpler operation to negotiate than other models, since contract language, describing acceptable performance and maintenance conditions at transfer, need not be classified in the agreement phase.

Principally, for governments willing to minimize their role and cut back on public service expenses, or which believe that public sector operations will run inefficient and therefore be more expensive for the government, the BOO scheme is even more attractive (Li, 2003).

In a LDO (Lease-Develop-Operate) contract, a private firm leases an existing, publicly owned facility and surrounding land from the host government then expands, develops, and operates the facility under a revenue-sharing contract with the host government for a fixed term but the legal title is held by the host government. The LDO model is attractive when private entities are not able to raise the full purchase price of the existing facility; moreover, very useful for risk allocation between public and private sectors when the project is currently losing money (Finnerty, 1996).

Privatization, which is the last concession method in this study, is giving the maximum authority to the private sector and can be applied to both an existing and a new project entirely possessed by the private sector. When the privatization is compared with no transfer ownership concessions, such as BOO, the main difference is that the privatization may be applied to an existing facility, and there are no concession conditions for private sector developers. However, Li (2003) has argued that in the new privatization the government is still bearing the responsibility of regulatory and control.

3.3. Critical Success Factors

The phrase, Critical Success Factors (CSF), was first used in the context of information systems and project management by Rockart (1982) and defined as "those few key areas of activity in which favorable results are absolutely necessary for a particular manager to reach his or her own goals...those limited number of areas where 'things must go right".

Since then, a number of researchers cited the CSF methodology in their researches and developed new definitions following Rockart's study, include: Boynton and Zmund (1984) defined critical success factors as "those few things that must go well to ensure success for a manager or an organization". Sanvido *et al.* (1992) also defined critical success factors as "those factors predicting success on projects and events or circumstances that require the special attention of managers". Yeo (1991), Sanvido *et al.* (1992) attempted to apply CSF method in construction management field. Tiong *et al.* (1992) identified CSF as "those characteristics...that when properly sustained and managed have a significant impact upon winning...those things that must be given special and continued attention and must go well to increase the...chances of success". Smith and Walker (1994) explained CSFs as "those factors in which success is necessary in order that each of the major project participants in a...project has the maximum chance of achieving the goals". Lim and Mohamed (1999) have noted that CSFs are "those needed to produce the desired deliverables for the customer". According to Ghosh *et al.* (2001) critical success factors measure end results and defined critical success factors as "keys success factors which are critical for excellent performance of the company, rather than just survival".

By segregating and analyzing the identified quotations a new definition of a critical success factors relating PPP projects is developed by Owen (1997); "those few factors which, when judiciously applied to a PPP scenario, can led to, and/or can actively contribute to, a profitable conclusion for one or more of the parties involved".

3.4. Critical Success Factors from Previous Researches

Interest in the project success has led to many researchers and practitioners do research on this subject.

Might and Fisher (1985) has announced three factors that are important for a successful project: the structure of the project organization, the nature of the project managers' authority and the size of the project measured by total cost.

Kerzner (1987) believe that there are six critical success factors for successful projects and they are identified as: corporate understanding of project management; executive commitment of project management, organization adaptability, project manager selection criteria, project manager‘s leadership style and commitment to planning and control.

Ashley *et al.* (1987) stated the following ten construction project success factors which express relationship between factors and success criteria toward reaching project success. The factors are project manager goal commitment, project manager capabilities and experience, planning efforts, project team motivation and goal orientation, scope and work definition, control systems, safety, design-construction interface management, technical uncertainty and risk identification and management.

Pinto and Slevin (1987) considered critical success factors as project mission - initial clearly defined goals and general directions; top management - willingness of top management to provide the necessary resources and authority/power from project success; project schedule/plan - a detailed specification of the individual action steps from project implementation, client consulting - communication, consultation and active listening to all impact parties; personnel - recruitment, selection and training of the necessary personnel

for the project team; technical tasks – availability of the required technology and expertise to accomplish the specific technical action steps; client acceptance - the act of "selling" the final project to its ultimate intended users; monitoring and feedback - timely provision of comprehensive control information at each stage in the implementation process; communication - the provision of an appropriate network and necessary data to all key actors in the project implementation and trouble-shooting - ability to handle unexpected crises and deviation from plan.

Baker *et al.* (1988) declared seven success factors with subdivisions along with their components as shown in Table 3.1 below:

Table 3.1. List of Success Factors and Their Components (Baker *et al.*, 1998).

Factors	Subdivisions
Coordinating and Relations Factor	Unity between project manager and contributing department managers
	Project team spirit. Project team sense of mission
	Project team goal commitment
	Project team capability
	Unity between project manager and public officials
	Unity between project manager and client contact
	Unity between project manager and his superiors
	Project manager’s human skills
	Realistic progress reports
	Project manager’s administrative skills
	Supportive informal relations of team members
	Authority of project manager
	Adequacy of change procedures
	Job security of project team
	Project team participants in decision making
	Project team participants in major problem solving
	Owner enthusiasm
	Availability of back-up strategies

Table 3.1. List of Success Factors and Their Components (Baker *et al.*, 1998) (Cont.).

Factors	Subdivisions
Adequate of Project Structure and Control Factors	Project manager's satisfaction with planning and control
	Team's satisfaction with organization structure
Project Uniqueness, Importance and Public Exposure Factor	Extent of public enthusiasm
	Project larger in scale than most
	Initial importance of state-of-art advancement
	Project was different than most
	Owner experience with similar project scope
	Favorability of media coverage
Success Criteria Salient and Consensus Factor	Importance to project manager- budget
	Importance to project manager- schedule
	Importance to owner- budget
	Importance to owner- schedule
	Importance to owner- technical performance
	Importance to project manager- technical performance
Completive and Budgetary Pressure Factor (Negative Impact)	Fixed price (as opposed to cost reimbursement) type of contract
	Highly competitive environment
	Owner heavy emphasis upon staying within the budget
	Project manager heavy emphasis upon staying within the budget
	Schedule overrun
	Difficulty in freezing design
	Unrealistic schedules
	Project was different than most
Internal Capabilities Build-Up Factor	Extent to which project built-up owner capabilities
	Original total budget
	Total cost project

Pinto and Prescott (1988) announced ten success factors which are visually presented in Figure 3.6 below:

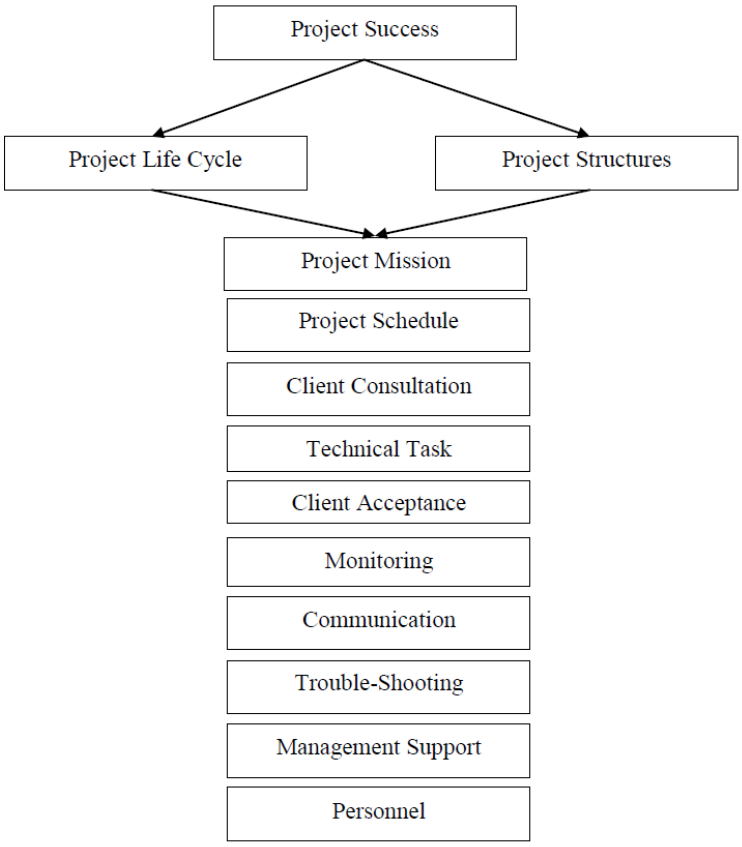

Figure 3.6. Success Factors (Pinto and Prescott, 1988).

Pinto and Covin (1989) pointed out 14 success factors from their research. Pinto and Covin (1989) pointed out 14 success factors from their research. The first ten of these factors are project team control related. Involvement of project team in the project formulation process makes the client more satisfied with and make use of project's output. The final four factors, while also having a significant impact on ultimate project success or failure, are external events (environment effects) can have important implications for project implementation, but may remain unforeseen until they actually occur. These factors are listed and briefly defined below:

(i) Mission: Initial clarity of goals and general directions
(ii) Top Management Support: Willingness of top management to provide the necessary resources and authority/power for project success
(iii) Project schedule/Plans: A detailed specification of the individual action steps required for project implementation
(iv) Client Consultation: communication, consultation, and active listening to all impact parties
(v) Personnel: Selection, recruitment, and training of necessary personnel for the project team
(vi) Technical Tasks: Availability of the required technology and expertise to accomplish the specific technical action steps
(vii) Client Acceptance: The act of selling the final project to its ultimate intended users
(viii) Monitoring and Feedback: Timely provision of comprehensive control information at each stage in the implementation process
(ix) Communication: The provision of an appropriate network and necessary data to all key actors in the project implementation
(x) Trouble-Shooting: The ability to handle unexpected crises and deviations from plan
(xi) Characteristics of the Project Team Leader: Competence of the project leader (administratively, interpersonally, and technically) and the amount of authority available to perform his/her duties
(xii) Power and Politics: The degree of political activities within the organization and the perception of the project as furthering an organization member‘s self-interests
(xiii) Environmental Effects: The likelihood of external organization or environmental factors impacting on the operations of the project team, positively or negatively
(xiv) Urgency: Perceiving the importance of project or the need to carry out the project as soon as possible.

White and Patton (1990) suggested ten critical success factors in their study as visible top management commitment and support, simple, flexible, phased stage/gate process, loose-tight controls capable of operating in chaotic environments, clear and communicated prioritization to align and focus scare resources on the most important changes, organizational integration: vertical (top-down)/horizontally (across functions)/externally (customers, suppliers, partners), procedures manual: it outlines

specific methods, systems and flow of information required to get stated goals, schedule control: derived from project goals and contract provisions, cost control (detailed actual costs, plan vs. actual costs on a cash-flow curve), meeting/monthly progress report: teams should meet regularly and redress any deviations from actual plan and quality control (must be closely scrutinized during the entire project).

Praffitt and Sanvido (1993) provided a checklist based on an atmosphere where the building owner, designer and contractor work together as a team to develop techniques and relationships for project success as critical success factors that can be used by building professionals as a guideline in predicting the success of a project.

Shenhar *et al.* (1997) identified 13 success factors derived from previous research and they were grouped into four dimensions; meeting design goals, benefit to the customer, commercial success and future potential. Evidently, all four-success dimensions have different importance level.

Wong and Maher (1997) identified the following key success factors from their research as listed in Table 3.2 below:

Table 3.2. List of Success Factors Identified by Wong and Mahler (1997).

Factors	Subdivisions
Organization	Adapting long-term view of China's evolving market
	Top management's role
	Company integrity
	The relevance of Western-style management in China
Strategy	Technology transfer
	Enhancing the visibility of Western product quality
	Converting to local sourcing
	Capturing regional markets by moving industrial manufacturing sites to the interior as soon as possible
	Pursuing the firm's core competence
Human Resources Management	Increasing the number of indigenous middle managers and technical personnel
	Choosing the right expertise

Chua *et al.* (1997) suggested the potential critical success factors for construction budget and schedule performance using neutral network approach covering the measures relating to the project management, project team, planning, and control effort. These factors are limited to measurable factors and the data were based on finished projects in the United States of America. The factors and their sub-factors list are shown in Table 3.3 below.

Table 3.3. List of Critical Success Factors Identified by Chua *et al.* (1997).

Factors	Sub-Factor
Project Manager	Number of meetings per month during lifetime of project
	Percentage of time project manager devoted to project
	Frequency of field visits per month during the construction phase
	Number of organizational levels between project manager and craftsmen
	Total years of project management experience
	Experience as project manager on project with similar cost, duration and technology type (number of projects)
Project Team	Percentage of project team-turnover rate per year
	Monetary incentive to designer (% of design contract)
Planning	Percentage of detail design complete at construction start
	Number of activities in project execution plan
	Percentage of contingency budget for project
	Implementation of constructability program control
	Number of formal progress inspections per month during construction
	Number of formal quality inspections per month during construction
	Number of formal safety inspections per month during construction
	Control system budget for project (% of total budget)
	Frequency of control meetings per month during the construction phase
	Frequency of project schedule updates per year

Kerzner (1998) identified in his book critical success factors as; adherence to schedules; adherence to budgets; adherence to quality standards; appropriateness and timing of sign-offs; adherence to change control processes; accomplishment of contract add-ons. Dvir *et al.* (1998) announced that most of their findings showed parallelism with previous studies. The findings have propounded that certain factors significant impact on the successful delivery of projects particularly relating to meeting budget and schedule goals and the same holds for systematic control of projects. Dvir *et al.* (1998) classified the factors as client satisfaction, pre-contract activities, project manager competency, involvement of the customers follow-up team, presence of key personnel during the entire duration of the project, communication and reports, project control schedule (resources & schedule), project milestones, design considerations (Quality and reliability, producibility, design to cost), budget management (profit & loss report) and management policy.

Clarke (1999) stated four critical success factors for a project as communication throughout the project, clear objectives and scope, breaking the project into "bite sized chunks" and using project plans as working documents.

The findings of a survey with experts from leading construction related organizations have revealed the critical success factors for the objectives of budget, schedule, and quality can be categorized the list into the four project aspects, namely project characteristics, contractual arrangements, project participants and interactive processes.

Kayworth and Leidner (2000) summarized some critical factors and sub-factors from their research as shown in Table 3.4 below.

Table 3.4. Summary of Success Factors and Sub-factors by Kayworth and Leidner (2000).

Factors	Sub-Factor
Communication	Emphasize continual communication
	Set meeting schedules and rules of engagement
	Conduct periodic face-to-face meetings
	Engage in term building activities at onset of virtual team creation
Culture	Install a sense of culture awareness
	Create teams from complementary cultures
Technology	Ensure infrastructure compatibility among geographic locations
	Assess political and economic barriers to international telecommunications
Project Management (Leadership)	State clear team goals and provide continuous performance feedback
	Build team cohesiveness
	Express flexibility and empathy toward team members
	Exhibit cultural awareness

Strategic dynamics and key success factors (KSFs) for excellence in performance of projects were pointed out by Ghosh *et al.* (2001) thorough interviewing with the companies and the findings showed that they can excel, even in the highly competitive and high operation cost environment. Their performances can be depended on their dynamisms and few KSFs that are obviously common to these successful companies. The top six KSFs were expressed as; a committed, supported and strong management team; a strong, visionary and capable leadership; adapting the correct strategic approach; ability to identify and focus on market; ability to develop and sustain capability; a good customer and client relationship.

Chan *et al.* (2001) asserted six factors that contribute to project success from their research as; project team commitment, contractor‘s competencies; risk and liability assessment; client‘s competencies and constraints imposed by end-users. These were derived from factor analysis on 31 variables developed through both empirical studies and project participant‘s opinions. These factors formed the basis for Design/Build project evaluation. A number of regression results showed that three of the factors were found to be critical in explaining the Design/Build project performance. In particular, the project team commitment, client‘s competencies and contractor‘s competencies are important to

bring about the successful outcome for public sector Design/Build projects. The contractor‘s competencies also contribute to project time performance. In summary, the commitment of and efforts input by all parties to the project plays an important role in Design/Build project success.

Qiao *et al.* (2001) suggested eight independent CSF‘s in Build Operate Transfer (BOT) projects in China for procurement of projects as: appropriate project identification, stable political and economic situation, attractive package, acceptable toll/tariff levels, reasonable risk allocation; selection of suitable subcontractors, management control and technology transfer.

Dvir *et al.* (2002) examined the relationship between project planning and project success in their study. It is claimed that the four success-measures are highly inter-connected. These four success-measures are, meeting planning goals (success as the project manager label), end-user benefit (success from the end-user viewpoint), contractor benefit (success at the contractor‘s level), overall success measure.

Based on the experience with transport infrastructure in Central and Southeastern Europe in the past 10–15 years Monsalve (2009) reported that, to be successful, a PPP scheme must have strong government support and long-lasting political engagement.

Key elements for success:

(i) Project selection and design
- Modesty and realism in planning and implementation
- Comprehensive feasibility studies
- Value-for-money analysis
- Appropriate risk sharing
- Adequate return for lenders and sponsors

(ii) Procurement and contract monitoring
- Open and competitive procurement
- Caution with unsolicited proposals

(iii) Legal and institutional framework

- Appropriate and stable legal and regulatory framework
- Central unit to lead preparation
- Role for international financial institutions.

Galilea and Medda (2010) have noted that even though there are many elements which influence the success of PPP agreements, in this analysis three main building blocks were taken into account: country experience, investors and multilateral lenders.

Country experience

- Country's past experience with transport PPPs
- Country's macroeconomic performance
- Country's corruption index
- Country's democratic accountability index
- Country's region

Investors

- Number of private investors
- Private percentage of the project contract or company owned by private investors

Multilateral lenders

- Role of multilateral lenders

Tiong (1996) investigated CSFs for private contractors in competitive tendering and negotiation in build–operate–transfer (BOT) projects, while Jefferies *et al.* (2002) examined build–own–operate–transfer (BOOT) project procurement for public clients in successfully management.

For an Australian sports stadium project, Jefferies *et al.* (2002) identified the CSFs as: solid consortium with a wealth of expertise; considerable experience; high profile and a good reputation; an efficient approval process that assisted the stakeholders in a very tight timeframe; and innovation in the financing methods of the consortium.

'Soft' critical success factors include: social support (Frilet, 1997); commitment (Stonehouse *et al.*, 1996; Kanter, 1999); mutual benefit (Grant, 1996). Kopp (1997) and Gentry and Fernandez (1997) have emphasized the importance of procurement transparency and competitive procurement process.

Table 3.5. Summary of CSFs for PPP Projects by Li *et al.* (2005).

Critical Success Factors	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)

4. METHODOLOGY

4.1. Introduction

This chapter is divided into two main segments. Part One presents the research methodology adopted in this study, and expands on the brief skeleton of Chapter 1. While Part Two deals with the respondents' information from the questionnaire survey. Only by use of appropriate methodologies and methods of research, applied meticulously, can the body of knowledge for construction be established and advanced with confidence.

Geddes (1968) promoted survey, analysis and plan as a method for a research project. A questionnaire survey is adopted as the most appropriate method to investigate what are the most important factors in managing construction PPPs successfully. The questionnaire has three parts; Parts One and Two deal with the general information and CSFs of PPP attributes respectively and Part Three with project specific questions, which are regarded as case study projects by the detailed Project parameters. The Statistical Package for Social Science (SPSS) software was applied in the analysis of the data collected. The results are expressed in mean value and frequency ranking. Significance of differences between the public and private sector is carried out by analysis of variance (ANOVA) technique. A multivariate statistical technique known as factor analysis was chosen as the method of grouping the components into a few, conceptually meaningful, relatively independent principal factors.

4.2. Research Method Selection

There are five important research methods adopted in construction management research, namely action research, ethnographic, survey, case study and experimental (Bell, 1993; Fellows and Liu, 1997). Action research is derived to suggest and test solutions for particular problems. In the ethnographic method the researcher is the part of the study group that explores and observes subjective behavior, circumstances etc. to form a judgment in what, how, and why, models of behavior occur. Case study allows thorough examination, whilst using experimental method is appropriate in case of the variables

involved are known or at least hypothesized with some confidence (Fellows and Liu, 1997). Surveys run based on statistical sampling by using questionnaires or interviews as a tool.

The questionnaire is one of the most frequently used methods of data collection in exploration and evaluation research (Popper, 1989; Fellows and Liu, 1997; Clarke and Dawson, 1999). The questionnaire method has been used by numerous journal papers as a research tool to investigate their research subjects or to conduct a comparative study (Li, 2003).

As advocated by Fellow and Liu (1997), what determine the research method are consideration of the scope and how much deep study is needed. The questionnaire is the broadest study, while case study is the deepest study, and interview is between them in the context of breadth and depth. Since the research is dealing with the PPP applications in the Turkish construction industry, questionnaire with a broad study is enough and the most proper way for this study.

This study exactly aims to investigate how various success factors affect observed success in the procurement of capital projects. CSFs in the procurement of capital projects are recent incidents and performing assessment of real-world situation is the best way of making judgment into the organization‘s success (Amponsah, 2010).

It has several advantages over other methods (Li, 2003):

- It is capable of producing large quantities of highly structural, standardized data.
- It can quickly provide access to a lot of people.
- It can be made anonymous which results in a more honest response, especially in sensitive subjects.
- It allows respondents to take time to answer the questions, where respondents can check records before finally answering.

- It addresses a standard set of questions to a larger sample of people than interviews can, while the results obtained may be fairly reliable.
- It can be used to provide the main research data, and can be a useful source of supplementary data.
- A questionnaire survey has other advantages of validity (avoidance of self-presentation and interviewer bias) and efficiency (low labor, cost and geographical dispersion).
- It reduces errors caused by the personal characteristics of interviewers and from the variability in their skills.

The quantitative study, which allows the respondents to describe their opinions in numerical data form, analyzes the views of experts from the private sector, semi-government or government sectors depending on their extensive experiences in the delivery of capital projects through PPP approach. In this research, this method helps to categorize the success factors according to their relative importance and mean values.

The participants were interviewed to find out their opinion at first hand on the critical success factors that directly affect the successful delivery of the PPP projects. Posted interviews were conducted to provide overall consideration on the CSFs for capital project in order to give a thorough description of individual experiences (Amponsah, 2010).

Fundamentally, due to two main reasons instead of random sampling convenient sampling method was thought to be more appropriate to use in this research as the sampling technique. The first reason for choosing this way is that there is no comprehensive, or any standard, database of organizations in Turkey that are involved in PPP projects. In addition, PPP procurement is evolving and as a result of this, the number of organizations involved is growing, but not in a form that means that the overall number of these organizations involved can be determined. Diekhoff (1992), Fellows and Liu (1997) have stated that in order to use random sampling method there must be large amount of organizations involved and the population is known.

In this research questionnaire survey was mailed to construction companies in top 500 of Turkey based on their annual revenues (only construction related companies) and Turkish Contractors Association members. Among the respondents, companies enable to do PPP as well as companies engaged in PPP are available.

The factors identified through the literature review were distilled initially into seventy-three factors and later into twenty-three success factors. Factor analysis was used to group success factors into five principal factors.

4.3. Survey Objectives

A questionnaire survey is adopted as the primary data collection instrument. Survey research seeks factual information, including what the respondents know about the subject under investigation, based on his/her knowledge, what the respondents did in the past and what they are doing now, and also their viewpoint on factors involved in the subject involved. Using the survey method, the respondents were asked to select one of the PPP projects that they have done and provide information on it. This project specific information can be regarded as a "case study". There is one main objective of the survey:

To investigate the critical success factors for PPP in Turkey from the perspectives of both the public and private sectors.

4.4. Population and Sample

The target population was experts in the construction industry who were involved in procurement of capital projects using Public-Private Partnership arrangement and the companies that have potential/capacity to undertake a PPP project. From the identified groups namely Chairman/Member of the Board of Directors, General Managers, Managers, Project Coordinators, Project Managers, Chiefs, Architect/Engineers, Consultants/ Contractors, Financiers and Operators participated in the survey process for the study nation-wide. A brief description of the participants who participated in the research is as follows (Amponsah, 2010):

The owner, public or private is the promoting party for whose wills the project is designed and built. Public owners range from agencies of the government down through state, county, and municipality entities to a multiplicity of local boards, commissions, and authorities.

A manager is the person or group of persons bearing the responsibility of carrying out the defined project objectives. Key project management responsibilities embrace creating clear and reasonable project objectives, implementing the project requirements, and managing the triple constraint for projects, which is cost, time, and scope. Mostly, the manager is the owner‘s representative and expected to determine and implement the exact requirements of the owner, based on knowledge of the firm they are representing. The key factors for a manager are the ability to adapt to the different internal procedures of the contracting party, and to form close links with the nominated representatives. These are vital in making certain that the key issues of cost, time, quality and above all, client satisfaction, can be realized.

The Consultants and contractors are the professionals who are employed by the owner for the purpose of providing consultation and implementation during the project at various phases. These professionals design and/or construct the project which just provides the relevant services on the needs of owners.

Financiers are a group of investors that hold large amount of money, typically concerning money lending, financing projects, large-scale investing, or large-scale money management. In a PPP project the financier is the source of funding the project and could be consist of a corporation of wealthy groups with investing capabilities.

The Operator is a private entrepreneur who institutes and operates the public facility and services, collects and manages the asset‘s revenues (rents or tolls) during the concession period and returns the asset in original condition at end of lease.

An Engineer/Architect approves project drawings and reports, oversees orders and delivery of equipment, takes care of any changes a client wants to make, resolves problems and ensures that work is completed on time and within budget.

4.5. Questionnaire Design

4.5.1. Questionnaire Structure

The questionnaire survey covers critical factors for the success of PPP projects:

The questionnaire as shown in Appendix 2 is divided into three parts:

- Part One: deals with general information about the respondents, including personnel designation, industrial experience, PPP experience, their organization scale in terms of annual turnover and employee numbers, and type of PPP project that they have been involved with.

- Part Two: This deals with non-project specific questions. In this part, the participants were asked to provide their perceptions of critical success factors in PPP, based on their general experiences.

- Part Three: This part of the questionnaire asked the respondents to identify a specific PPP project, which reached financial close that they have been directly involved with.

4.5.2. Ranking Scales

The rating systems for the criticality of each variable in the questionnaire the Likert scale, which has an interval between 1 and 5, is adopted (Table 4.1). Recently, this kind of scale has been used for several construction management studies.

Table 4.1. Rating Systems for Criticality of Variables.

Rating Score	Criticality of Variables
1	Not Significant
2	Fairly Significant
3	Significant
4	Very Significant
5	Extremely Significant

4.6. Statistical Methods

Various types of structural analysis were undertaken on the questionnaire data collected, including mean ranking, Analysis of various (ANOVA), factor analysis, etc., using the Statistic Package for Social Science (SPSS) window version 15.0. This statistical analysis is described as followed:

4.6.1. Mean Ranking

Mean ranking is used to determine the significance of each factor rated by the respondents. Similar practice had been used by Wang *et al.* (1999) and Kululanga *et al.* (2001) before when realizing assessment from survey results. The mean can be calculated as:

$$\text{Mean} = \frac{\sum_{i=1}^{5} iN_i}{\sum_{i=1}^{5} N_i} \tag{4.1}$$

Where N_5 is the number of respondents who answered "extremely significant", N_4 is the number of respondents who answered "very significant", N_3 is the number of respondents who answered "significant", N_2 is the number of respondents who answered "fairly significant", and N_1 is the number of respondents who answered "not significant".

4.6.2. One-way ANOVA

One way analysis of variance is needed when only one variable is used to classify cases into the different groups. In the following chapter, each variable is discussed by three different groups, the public/private client and the contractor. Among the groups mean square is based on how much the group means vary among themselves. If the null hypothesis is true, the two numbers (group means) should be close to each other.

F statistic is a ratio used to test the null hypothesis, where the between-groups mean square is divided by the within-groups mean square. Observed significance level is

retrieved by comparing the calculated *F* value to the *F* distribution. The significance level is based on both the actual *F* value and on the degree of freedom for the two mean squares. If the observed significance level is small, i.e. less than 0.01 or 0.05, the null hypothesis should be rejected. The 0.01 and 0.05 are equivalent to 1% and 5% significance level respectively.

4.6.3. The Reliability Coefficient

One of the most commonly used reliability coefficients is Cronbach's alpha Alpha (a) is based on the "internal consistency" of a test (Cronbach, 1951). That is, it is based on the average correlation of items within a test. If a test were perfectly reliable, this correlation would be 1.00. If the test were totally unreliable, the correlation would be zero (Graham and Lilly, 1984). What is regarded as a satisfactory level of reliability is dependent on how a measure is being used. According to Nunnally (1978), in the early stages of research on predictor tests, or hypothesized measures of a construct, one saves time and energy by working with instruments that have only modest reliability, for which purpose reliabilities of 0.70 or higher will suffice.

In SPSS, the Cronbach's a can be computed using the following formula:

$$\alpha = \frac{k\overline{\text{cov}} / \overline{\text{var}}}{1+(k-1)\overline{\text{cov}} / \overline{\text{var}}} \tag{4.2}$$

where *k* is the number of items in the scale, coif is the average covariance between items, and var is the average variance of the items. If the items are standardized to have the same variance, the formula can be simplified to:

$$\alpha = \frac{k\bar{r}}{1+(k-1)\bar{r}} \tag{4.3}$$

where *r* is the average correlation between items (Norusis, 1992). Cronbach's *a depends* on both the length of the test (k in the formula) and the correlation of the items on the test.

4.6.4. Factor Analysis

Factor analysis is a statistical technique used to identify a relatively small number of factors that can be used to represent relationships among sets of many inter-related variables (Norusis, 1992). Pictorially, this purpose of factor analysis is represented by Figure 4.1, in which the mass of several overlapping circles of various shades is reconstituted into two relatively non-overlapping circles with different shading patterns.

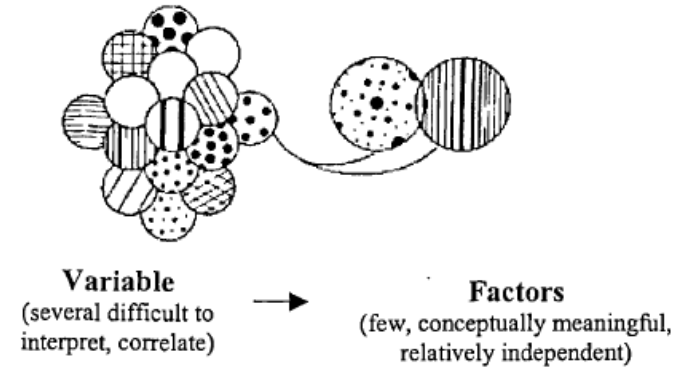

Figure 4.1. General Purpose of Factor Analysis (Kleinbaum *et al.*, 2008).

The mathematical model for factor analysis appears somewhat similar to a multiple regression equation. Each variable is expressed as a linear combination of factors which are not actually observed. In general, the model for the *th* standardized variable is written as:

$$Xi = A,1F + A12F2 + AikFk + Ui \qquad (4.4)$$

Where the F's are the common factors, the U unique factor, and the *A's* are the coefficients used to combine the *k* factors. The unique factors are assumed to be uncorrelated with each other and with the common factors.

The general expression for the estimate of the factor, F is

$$F_j = \sum_{i=1}^{p} W_{ji} X_i = W_{j1} X_1 + W_{j2} X_2 + ... + W_{jp} X_p \qquad (4.5)$$

where W 's are known as factor score coefficients, and p is the number of variables.

Factor analysis usually proceeds in four steps.

(i) In the first step, the correlation matrix for all variables is computed. Variables that do not appear to be related to other variables can be identified from the matrix and associated statistics.
(ii) In the second step, factor extraction — the number of factors necessary to represent the data and the method for calculating them — must be determined.
(iii) The third step, rotation, focuses on transforming the factors to make them more interpretable.
(iv) At the fourth step, scores for each factor can be computed for each case. These scores can then be used in a variety of other analysis.

Several important measures, such as Bartlett's test of sphericity, KMO, MSA and procedures (factor extraction, loading) in the factor analysis are introduced in the following sections.

4.6.4.1. Bartlett's Test of Sphericity. Bartlett's test of sphericity can be used to test the hypothesis that the correlation matrix is an identity matrix; that is, all diagonal terms are 1 and all off-diagonal terms are 0. If the value of the test statistic for sphericity is large and the associated significant level is small, it appears unlikely that the population correlation matrix is an identity.

4.6.4.2. Kaiser-Meyer-Olkin Measure. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy is an index for comparing the magnitudes of the observed correlation coefficients to the magnitudes of the partial correlation coefficients. It is computed as

$$KMO |= \frac{\sum\sum_{i \neq j} r_{ij}^2}{\sum\sum_{i \neq j} r_{ij}^2 + \sum\sum_{i \neq j} \alpha_{ij}^2} \quad (4.6)$$

where r_{ij} is the simple correlation coefficient between variables i and j, and a_{ij} is the partial correlation coefficient between variables i and j . If the sum of the squared partial correlation coefficients between all pairs of variables is small when compared to the sum of the squared correlation coefficients, the KMO measure is close to 1. Small values for the KMO measure indicate that a factor analysis of the variables may not be a good idea, since correlations between pairs of variables cannot be explained by the other variables. Kaiser characterized measures in the 0.90's as marvelous, in the 0.80's as meritorious, in the 0.70's as middling, in the 0.60's as mediocre, in the 0.50's as miserable, and below 0.50 as unacceptable.

4.6.4.3. Measures of Sampling Adequacy (MSA). A measure of sampling adequacy can be computed for each individual variable in a similar manner. Instead of including all pairs of variables in the summations, only coefficients involving that variable are included. For the ith variable, the measure of sampling adequacy is

$$MSA_i = \frac{\sum_{j \neq i} r_{ij}^2}{\sum_{j \neq i} r_{ij}^2 + \sum_{j \neq i} \alpha_{ij}^2} \quad (4.7)$$

Only reasonably large values are needed for a good factor analysis. Thus, variables with small values should be eliminated for the measure of sampling adequacy.

4.6.4.4. Factor Extraction. The goal of factor extraction is to determine the factors. In principal component analysis, linear combinations of the observed variables are formed. The first principal component is the combination that accounts for the largest amount of variance in the sample. The second principal component accounts for the next largest amount of variance and is uncorrelated with the first. Successive components explain progressively smaller portions of the total sample variance, and all are uncorrelated with each other.

4.6.4.5. Rotation Phase. Although the factor matrix obtained in the extraction phase indicates the relationship between the factors and the individual variables, it is usually difficult to identify meaningful factors based on this matrix. Most factors are correlated with many variables. The purpose of rotation is to achieve a simple structure. The most commonly used method for orthogonal rotation is the varimax method, which attempts to minimize the number of variables that have high loadings on a factor. Rotation does not affect the goodness of fit of a factor solution. This is, although the factor matrix changes, the communalities and the percentage of total variance explained do not change.

4.6.4.6. Interpreting the Factors. A convenient strategy is to sort the factor pattern matrix so that variables with high loadings on the same factor appear together. Having deducted the loadings less than 0.5, the factor represented the significant associating variables.

4.7. Respondents' Information

The questionnaire survey study provides coherent information on the state of PPP in Turkey. Efforts, including email and telephone call, had been made to non-respondents to encourage them to participate in this survey. After the questionnaires had been posted, a total of 82 completely filled questionnaires had been returned. The effective return rate is not high. Since the all participants did not involve in PPP projects, the response rates to the three parts of questionnaire are different, 82 respondents to Part 1 and 2, and 23 respondents for Part 3.

4.7.1. Respondents' Personal Info

Table 4.2 to 4.4 present a summary of information on the respondents that completed the questionnaire. The respondents' information from the contractors, public and private clients with overall totals are presented to show disaggregated and aggregated outcomes. This is important to provide a context for the statistical analysis.

All of the 82 participants declared their position, are chairman/member of the Board of the Directors (6), general manager (6), project coordinator (9), project manager (3), manager (12), chief (9), engineer/architect (32) and other (5), as shown in Table 4.3.

Table 4.2. Respondents' Positions.

Num. of Employee	Director	General Manager	Project Coordinator	Project Manager	Manager	Chief	Engineer/ Architect	Other	Total
0-20	2	0	2	0	0	0	0	0	4
21-50	1	0	0	1	0	0	2	0	4
51-100	0	1	0	0	0	1	6	0	8
101-200	1	2	3	1	2	2	10	0	21
> 200	2	3	4	1	10	6	14	5	45
Total	6	6	9	3	12	9	32	5	82

Most of the respondents have spent a long time in the industry, as indicated in Table 4.3. All respondents provided number of years of experience share an average of 10,96 years of industrial experience (standard deviation = 8.47), as shown in Table 4.4. The average age of the respondents is 34 years and it is in line with the average experience value. Only twenty-two out of eighty-two have experience equal or less than five years.

Table 4.3. Respondents' Experience.

Experience (year)	Director	General Manager	Project Coordinator	Project Manager	Manager	Chief	Engineer/ Architect	Other	Total
0-5	1	0	2	0	2	0	15	0	20
5-10	0	0	5	0	7	4	11	1	28
10-15	2	1	1	1	0	4	4	2	15
15-20	1	2	1	0	2	0	1	1	8
20-25	2	0	0	1	0	1	0	1	5
25-30	0	1	0	0	0	0	1	0	2
> 30	0	2	0	1	1	0	0	0	4
Total	6	6	9	3	12	9	32	5	82

Table 4.4. Experience of Respondents by Core Business.

Position of Respondent in Company	Private Client		Public Client		Contractor		Total	
	Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation
Chairman of Board of Directors	12.00	.	13.00	.	.	.	12.50	.707
Member of Board of Directors	22.67	2.517	.	.	4.00	.	18.00	9.557
General Manager	24.00	12.728	18.00	.	33.33	19.296	27.67	14.989
Manager	9.00	4.301	7.00	2.828	10.60	3.782	9.33	3.798
Project Coordinator	9.00	1.000	3.00	.	10.40	5.857	9.11	4.807
Project Manager	22.00	12.728	.	.	25.00	.	23.00	9.165
Chief	.	.	11.75	2.986	12.40	5.505	12.11	4.314
Engineer/Architect	7.86	4.525	3.50	.707	5.61	3.394	5.97	3.668
Other	.	.	16.00	.	14.25	5.560	14.60	4.879
Total	13.00	8.350	9.83	5.289	10.26	9.143	10.96	8.477

4.7.2. Respondents' Organization Information

Information on the organizations that participated in the questionnaire survey in respect of number of employee, turnover, PPP experience, PPP project type undertaken

and the role of the establishment is shown by Tables 4.5 to 4.11. Also the texts are given to indicate information on the public sector, private sector and overall response.

The participants' organizations are very diverse, both in terms of annual turnover and employee numbers. The number of employees in the respondents' organizations, with small-scale employment (<100 employee) only occupying 20% is shown in Table 4.5. The largest percentage of participation in both public and private sectors is occupied by large organizations. The fifty-five percent of the respondents are working in large organizations (>200 employees). The organizations having 101-200 and 51-100 employee with a share of 25% and 10% respectively follow them (Table 4.5).

Table 4.6 expresses the annual turnovers of the respondents' organizations. In contractors, more participants come from large organizations (>1000) than the others but they generate the big part of the small scale organizations at the same time with 17 respondents. The research showed that private sector is very diverse in terms of annual turnover from the smallest to largest scale. Among the public client respondents, since the public entities have to provide basic public services it is observed that they condensed in moderate organizations and there is not any respondent in 0-100 scale.

Table 4.5. Organizations Distribution by Number of Employees.

Number of Employee	**Core Business in Construction Industry**			**Total**
	Private Client	**Public Client**	**Contractor**	
0-20	1 4.3%	0 0%	3 6.4%	4 4.9%
21-50	1 4.3%	2 16.7%	1 2.1%	4 4.9%
51-100	1 4.3%	0 0%	7 14.9%	8 9.8%
101-200	8 34.8%	1 8.3%	12 25.5%	21 25.6%
>200	12 52.2%	9 75%	24 51.1%	45 54.9%
Total	23 28%	12 14.6%	47 57.3%	82 100%

Twenty-six out of eighty-two have involved in a PPP project at least once. Fifty-seven percent of them stated that they have involved in at least 2 PPP projects. Eleven organizations have only been involved in one PPP project. Table 4.7 shows the general distribution of PPP experience among public client, contractor and private clients. Table 4.8 and 4.9 detail this distribution according to the annual turnover and employee numbers.

Table 4.6. Organizations Distribution by Annual Turnovers.

Annual Turnover (million $)	**Core Business in Construction Industry**			**Total**
	Private Client	**Public Client**	**Contractor**	
0-100	8 47.1%	0 0%	17 54.8%	25 46.3%
100-300	7 41.2%	5 83.3%	2 6.5%	14 25.9%
300-500	0 0%	0 0%	3 9.7%	3 5.6%
500-1000	1 5.9%	1 16.7%	3 9.7%	5 9.3%
>1000	1 5.9%	0 0%	6 19.4%	7 13%
Total	17 31.4%	6 11.1%	31 57.4%	54 100%

Table 4.7. PPP Experiences by Organization.

Involved with PPP	**Core Business in Construction Industry**			**Total**
	Private Client	**Public Client**	**Contractor**	
Yes	7 30.4%	6 50%	13 27.7%	26 31.7%
No	16 69.6%	6 50%	34 72.3%	56 68.3%
Total	23 28%	12 14.6%	47 57.3%	82 100%

It is indicated by table 4.8 and 4.9 that the case of "no PPP experience" happens generally in small organizations. Larger organizations appear to have more PPP projects. This may state that large organizations in both the public and private sectors may be favored by this PPP project development. This is foreseen, since the smaller organizations may have limited financial ability, technical know-how and risk taking ability etc., in order to participate in PPP projects and circumstances in which move them away from the idea.

Table 4.8. PPP Experiences by Organization Annual Turnover Scale.

Involved with PPP	**Annual Turnover (million $)**	**Core Business in Construction Industry**			**Total**
		Private Client	**Public Client**	**Contractor**	
Yes	0-100	4 100%		3 25%	7 43.8%
	300-500	0 0%		2 16.7%	2 12.5%
	500-1000	0 0%		3 25%	3 18.8%
	>1000	0 0%		4 33.3%	4 25%
	Total	4 25%		12 75%	16 100%
No	0-100	4 30.8%	0 0%	14 73.7%	18 47.4%
	100-300	7 53.8%	5 83.3%	2 10.5%	14 36.8%
	300-500	0 0%	0 0%	1 5.3%	1 2.6%
	500-1000	1 7.7%	1 16.7%	0 0%	2 5.3%
	>1000	1 7.7%	0 0%	2 10.5%	3 7.9%
	Total	13 34.2%	6 15.7%	19 50%	38 100%

Table 4.9. PPP Experiences by Organization Employee Numbers.

Involved with PPP	Number of Employee	Core Business in Construction Industry			Total
		Private Client	Public Client	Contractor	
Yes	0-20	1 14.3%	0 0%	0 0%	1 3.8%
	21-50	0 0%	1 16.7%	0 0%	1 3.8%
	51-100	1 14.3%	0 0%	0 0%	1 3.8%
	101-200	0 0%	0 0%	1 7.7%	1 3.8%
	>200	5 71.4%	5 83.3%	12 92.3%	22 84.6%
	Total	7 26.9%	6 23%	13 50%	26 100%
No	0-20	0 0%	0 0%	3 8.8%	3 5.4%
	21-50	1 6.3%	1 16.7%	1 2.9%	3 5.4%
	51-100	0 0%	0 0%	7 20.6%	7 12.5%
	101-200	8 50%	1 16.7%	11 32.4%	20 35.7%
	>200	7 43.8%	4 66.7%	12 35.3%	23 41.1%
	Total	16 28.5%	6 10.7%	34 100%	56 60.7%

As indicated in Table 4.10, the type of PPP projects that the organizations have had involvement in is also shown by the result. The main categories are listed for the respondents to shows where they have had involvement. The organizations have experience in the main categories with the highest involvement being in is transportation (railway and highway) PPP projects, followed by hospitals and industrial plants & urban infrastructure.

Among six public sector cases, none of them reports a hospital, power & energy, highway, airport, industrial plants & urban infrastructure project; while three cases are in railway projects; the other types of project share three cases as well. Among the twenty-one private sector (client and contractor) cases, they have involved in each project category. Between the public and private sector combined there are 26 cases.

Table 4.10. PPP Project Category.

Sectors	Core Business in Construction Industry						Total	
	Private Client		Public Client		Contractor			
	Number	%	Number	%	Number	%	Number	%
Hospital	1	14.3	0	0	4	30.8	5	19.2
Power & Energy	1	14.3	0	0	0	0	1	3.8
Highway	0	0	0	0	4	30.8	4	15.4
Airport	0	0	0	0	2	15.4	2	7.7
Industrial Plants & Urban Infrastructure	0	0	0	0	2	15.4	2	7.7
Railways	3	42.9	3	50	0	0	6	23.1
Other	2	28.6	3	50	1	7.7	6	23.1

4.8. PPP Project Information

This section categorizes the PPP projects on which the respondents have provided information in terms of project types, procurement arrangement, project location, project value, project duration, finance structure, and revenue resources etc. As given in Section 4.7, out of the 82 responses that were received, only 26 have responded to the project specific questions section of the questionnaire.

4.8.1. The PPP Projects' Types, Procurement Methods and Locations

Table 4.11 reports the PPP project procurement approaches adopted on these projects. From 22 cases, 54% of the projects are procured under the arrangement of build-operate-transfer (BOT). The other ten approaches share the rest of 46%. With a share of 22% and 5 cases transfer of operating rights (TOR) follows. Build-Lease (BL) has 2 cases

and its share of quite small for now but in a close future the quantity will be expand with the implementation of integrated health campus projects. Other cases have 3 projects with a thirteen percent share of. This is not unexpected for BOT. which is the most popular PPP procurement in Turkey.

Table 4.11. PPP Project Procurement Arrangement by Sector.

	Procurement Type									
	BOT		**BL**		**BO**		**TOR**		**OTHER**	
Sectors	**Number**	**%**	**Number**	**%**	**Number**	**%**	**Number**	**%**	**Number**	**%**
Hospital	2	20	2	100	1	50	0	0	0	0
Power & Energy	1	10	0	0	0	0	0	0	0	0
Highway	3	30	0	0	1	50	0	0	0	0
Airport	2	20	0	0	0	0	0	0	0	0
Industrial Plants & Urban Infrastructure	1	10	0	0	0	0	1	25	0	0
Railways	0	0	0	0	0	0	3	75	1	25
Other	1	10	0	0	0	0	0	0	3	75
Total	10	45	2	9	2	9	4	18	4	18

Only four cases are based on abroad projects. as shown in Table 4.12. The locations of other cases are local projects.

Table 4.12. Project Location.

Sector	Project Location		Total
	Domestic	Abroad	
Hospital	4 22.2%	1 25%	5 22.7%
Power & Energy	1 5.6%	0 0%	1 4.5%
Highway	3 16.7%	1 25%	4 18.2%
Airport	0 0%	2 50%	2 9.1%
Industrial Plants & Urban Infrastructure	1 5.6%	0 0%	1 4.5%
Railways	3 16.7%	0 0%	3 13.6%
Other	6 33.3%	0 0%	6 27.3%
Total	18 81.8%	4 18.18%	22 100%

4.8.2. The PPP Projects' Costs, Duration and Finance

The project values, both in terms of construction cost and operation cost, are shown in Table 4.13 and 4.14. Most of the cases can be regarded as medium and large scale, based on their project construction costs and operation NPV; only three transportation projects can be regarded as mega project (>1000 mil. $). Lack of small size projects, in term of construction cost and operation cost, is not unexpected as small projects may be uneconomical for the amount of resources required for a PPP project tendering process, and the construction procedure (Ezulike et al., 1997; Lipson, 2002) when small projects are involved, particularly for railway and other projects.

Table 4.13. PPP Construction Cost (Million USD).

Construction Cost (Million $)	Sector of PPP Projects							
	Hospital	Power & Energy	Highway	Airport	Industrial Plants & Urban Infrastructure	Railways	Other	Total
0-250	0 0%	0 0%	0 0%	0 0%	0 0%	1 50%	2 100%	3 18.8%
250-500	2 50%	1 100%	0 0%	0 0%	0 0%	0 0%	0 0%	3 18.8%
500-750	1 25%	0 0%	1 25%	1 50%	1 100%	0 0%	0 0%	4 25%
750-1000	1 25%	0 0%	1 25%	1 50%	0 0%	0 0%	0 0%	3 18.8%
>1000	0 0%	0 0%	2 50%	0 0%	0 0%	1 50%	0 0%	3 18.8%
Total	4 25%	1 6.2%	4 25.0%	2 12.5%	1 6.2%	2 12.5%	2 12.5%	16 100%

Table 4.14. PPP Operation Cost (Million USD).

Operation Cost (Million $)	Sector of PPP Projects				Total
	Hospital	Power & Energy	Highway	Other	
0-25	0 0%	1 100%	0 0%	1 100%	2 33.3%
25-50	2 100%	0 0%	0 0%	0 0%	2 33.3%
50-100	0 0%	0 0%	1 50%	0 0%	1 16.7%
>100	0 0%	0 0%	1 50%	0 0%	1 16.7%
Total	2 33.3%	1 16.6%	2 33.3%	1 16.6%	6 100%

The project duration by planning, construction and operation phases is presented by Table 4.15. Most of the projects have 1-2 years or less in planning, 1-3 years in construction, and 20-25 years of operation by private contractors.

Table 4.15. PPP Project Duration.

Duration		Sector of PPP Projects							Total
		Hospital	Power & Energy	Highway	Airport	Industrial Plants & Urban Infrastructure	Railways	Other	
Planning	0-6 months	0 0%	0 0%	0 0%	0 0%	0 0%	1 33.3%	3 50%	4 20%
	6 months-1 year	1 25%	0 0%	1 33.3%	0 0%	0 0%	0 0%	2 33.3%	4 20%
	1-2 year	2 50%	1 100%	1 33.3%	2 100%	1 100%	1 33.3%	1 16.7%	9 45%
	>2 years	1 25%	0 0%	1 33.3%	0 0%	0 0%	1 33.3%	0 0%	3 15%
	Total	4 20%	1 5%	3 15%	2 10%	1 5%	3 15%	6 30%	20 100%
Construction	0-2 years	2 50%	0 0%	0 0%	1 50%	0 0%	0 0%	3 75%	6 33.3%
	2-3 years	2 50%	0 0%	2 50%	1 50%	1 100%	0 0%	1 25%	7 38.9%
	3-4 years	0 0%	1 100%	2 50%	0 0%	0 0%	1 50%	0 0%	4 22.2%
	>4 years	0 0%	0 0%	0 0%	0 0%	0 0%	1 50%	0 0%	1 5.6%
	Total	4 22.2%	1 5.5%	4 22.2%	2 11.1%	1 5.5%	2 11.1%	4 22.2%	18 100%
Operation	20-25 year	4 100%	0 0%	2 66.7%	1 50%		0 0%	0 0%	7 58.3%
	25-30 year	0 0%	0 0%	1 33.3%	0 0%		0 0%	1 100%	2 16.7%
	35-40 year	0 0%	0 0%	0 0%	1 50%		0 0%	0 0%	1 8.3%
	45-50 year	0 0%	1 100%	0 0%	0 0%		1 100%	0 0%	2 16.7%
	Total	4 33.3%	1 8.3%	3 25%	2 16.6%		1 8.3%	1 8.3%	12 100%

Table 4.16 shows the PPP project finance structure in equity ratio. All of the intervals have nearly equal number of cases. There are six cases both in 10-20% and 40-50% equity ratio interval and in 20-30% we have 5 cases. Providers of equity fall into two categories; those with direct interest in the project operation and those who are solely involved as equity investors.

Table 4.16. PPP Project Finance Structure (Equity/Total Investment).

Equity/Total Investment (%)	**Sector of PPP Projects**							**Total**
	Hospital	**Power & Energy**	**Highway**	**Airport**	**Industrial Plants & Urban Infrastructure**	**Railways**	**Other**	
10-20	3 75%	0 0%	0 0%	2 100%	0 0%	1 50%	0 0%	6 35.3%
20-30	1 25%	0 0%	0 0%	0 0%	1 100%	1 50%	2 50%	5 29.4%
40-50	0 0%	1 100%	3 100%	0 0%	0 0%	0 0%	2 50%	6 35.3%
Total	4 23.5%	1 5.8%	3 17.6%	2 11.7%	1 5.8%	2 11.7%	4 23.5%	17 100%

5. PPP IN CONSTRUCTION DEVELOPMENT IN TURKEY

5.1. Introduction

This chapter presents part of the research results from a questionnaire survey. This study explores factors that contribute to the successful procurement of capital projects which is seen as one of the many management practices that contribute to corporate success.

The main research question of this study was - what are the Critical Success Factors for procurement of capital projects using Public-Private Partnership Projects?

This chapter presents the data collection process and explains how the data collected from the survey instrument were prepared, administered and statistically analyzed. Data were collected based on a questionnaire survey (see section 4.5). The analysis presented in this chapter starts with a reliability test for all the collected data. Two separate statistical analyses were undertaken using the Statistical Package for Social Science (SPSS). The first analysis ranked the factors, based on the mean value of responses, and compared the mean for the three groups (public/private client and contractor) and presented associated analysis of variance (ANOVA) for each factor within a series of PPP attributes.

The second analysis explored and detected the underlying relationships among the attributes of PPPs, using factor analysis. The principal component analysis for factor extraction is used in the analysis; the distinctive characteristic being its data-reduction capacity. CSFs are separately determined and extracted, using factor analysis.

5.1.1. Web Survey

The web survey was conducted electronically via a web site administered by drive.google.com. The web survey was conducted from November 29, 2013 through February 28, 2014. As mentioned in the previous chapter, the target population was experts

consisting of Owners, Project Managers, Consultants/Contractors, Financiers and Operators in the construction industry. Participants for the survey were mainly enlisted from the Turkish Contractors Association. The recruitment commenced in November 2013. The potential participants were emailed to seek their permission to participate in the study. The email invitations were personalized to the individuals so as to prevent spamming and to increase the level of response rate for the survey.

Participants were listed from the directories and were invited to participate in the survey and 82 of them responded.

The survey questionnaire contained three parts. The first part asks for personal information on the organization which the respondents worked which included eight questions. Data it asked for the core business of the respondent and the population of the organization. Part two requested for critical success factors. Twenty-three factors were asked and respondent were asked to select from five points. This part was based on a five-point Likert scale, and were coded as 1 = "Not Significant", 2 = "Fairly Significant", 3 = "Significant". 4 = "Very Significant ", 5 = "Extremely Significant". Finally the third part asks participants to consider their professional experience, in context of Public-Private Partnership projects, and as owner, project manager, consultant/contractor, financier or operator.

5.2. Analysis and Ranking

Mean ranking is the most convenient way to identify and compare the importance of factors on an attribute basis. The ranking results of CSF attribute of PPPs are separately listed in Tables 5.2 and 5.3. The success factors are summarized in Table 5.2. All the respondents' information has been presented in the previous chapter under Section 4.8.

5.2.1. Reliability Test

Before carrying out the data analysis, a reliability test was carried out to ensure that it was worthwhile to go ahead. For Critical Success Factors of PPP the Cronbach alpha reliability is produced, as shown in Table 5.1. The research results shown in Table 5.1 the

Cronbach’s alpha value 0.873 is greater than 0.7 of the Nunnally guideline. Based on Nunnally's (1978) suggestion, in the early stages of research on predictor tests or hypothesized measures of a construct, reliability of 0.70 or higher will suffice. As explained in Chapter 4 Section 4.6.3, this means that the data collected from the survey is inter-related, thus the experiment is repeatable and the scale (or measurement) is reliable according to Norusis (1992).

Table 5.1. Reliability of Data.

Cronbach's Alpha	N of Items
.873	23

5.2.2. Critical Success Factors

Investigation of critical success factors for construction PPP projects is the objective of this study. This section presents primary results from the questionnaire survey. Based on the twenty-three factors identified from the literature review as being critical success factor for PPP projects, the response information shows that indeed these are critical factors with a mean value for each factor ranging from 2.99 to 4.33 as shown in Table 5.2. Fifteen factors out of 23 receive mean values about or greater than 4.0. These are regarded as very significant factors, while 8 factors have mean values about or over 3.0, as significant factors.

Table 5.2. Factors Contributing to the Success of PPP Projects.

CSFs	Private Client		Public Client		Contractor		Total		Criticality	F	Sig. (%5)
	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank			
Favorable Legal Framework	4.52	1	4.75	1	4.13	8	4.33	1	Very Significant	2.047	0.136
Detailed/Clear Project Identification	4.48	2	4.42	6	4.23	1	4.33	2	Very Significant	0.45	0.639
Extensive, Reasonable Cost-Benefit Assessment	4.3	6	4.58	3	4.21	2	4.29	3	Very Significant	0.258	0.773
Contractor/Client Competency	4.39	3	4.5	5	4.17	6	4.28	4	Very Significant	0.228	0.797
Thorough Technical Feasibility	4.39	4	4.75	2	4.06	10	4.26	5	Very Significant	0.565	0.571
Motivated and Experienced Project Team	4.26	10	4.25	9	4.19	4	4.22	6	Very Significant	0.099	0.906
Attractive Financial Package	4.3	7	3.92	15	4.13	7	4.15	7	Very Significant	2.428	0.095
Rational and Practical Project Manager	4.26	9	4.25	8	4.06	9	4.15	8	Very Significant	0.24	0.788
Favorable/Sound Investment Environment	3.87	16	4.33	7	4.17	5	4.11	9	Very Significant	0.314	0.732
Proper and Systematic Schedule/Cost/Quality/Budget Control	4.35	5	4	14	3.96	12	4.07	10	Very Significant	0.048	0.953
Stable Political and Economic Situation	4	12	4.5	4	3.94	13	4.04	11	Very Significant	0.525	0.593
Regular Monitoring and Feedback	4	13	4.17	12	4.02	11	4.04	12	Very Significant	0.713	0.493
Solid Private Consortium	3.52	20	4.17	11	4.19	3	4	13	Very Significant	1.608	0.207
Good Communication and Relations Among Stakeholders	4.26	8	4	13	3.83	15	3.98	14	Significant	0.953	0.39
Meeting Design Goals	4.09	11	3.92	16	3.91	14	3.96	15	Significant	0.062	0.94
Strong Public Entity	3.96	14	3.58	20	3.74	17	3.78	16	Significant	2.076	0.132
Clear, Comprehensive Project Executive Strategies	3.7	18	3.75	19	3.77	16	3.74	17	Significant	0.065	0.937
Executive Commitment of Public/Private Sectors	3.78	17	3.83	17	3.68	18	3.73	18	Significant	0.176	0.839
Broad/Reasonable Risk Analysis and Risk Sharing	3.57	19	4.25	10	3.64	19	3.71	19	Significant	0.244	0.784
Efficient/Competitive Procurement Process	3.91	15	3.75	18	3.47	20	3.63	20	Significant	2.21	0.116
Effective Client Consulting	3.43	21	3.5	21	3.34	21	3.39	21	Significant	0.613	0.544
Simple Structure of Project Organization	3.26	22	3.25	22	3.34	23	3.3	22	Significant	0.215	0.807
Wide Client Acceptance	3.04	23	3.08	23	2.94	22	2.99	23	Significant	0.499	0.609

Very significant success factors for PPP projects:

The fifteen factors perceived as very significant, with mean values approximately 4.0 and over are solid private consortium, extensive, reasonable cost-benefit assessment, favorable/sound investment environment, stable political and economic situation, favorable legal framework, rational and practical project manager, contractor/client competency, thorough technical feasibility, motivated and experienced project team, detailed/clear project identification, proper and systematic schedule/cost/quality/budget control, regular monitoring and feedback, good communication and relations among stakeholders, meeting design goals.

A favorable legal framework, ranked in the first place, is the fundamental issue in establishing PPPs, as previously discussed in Section 2.3.2. It has a high mean value of 4.33. Bennett (1998) noted that a providing regulatory, legal and political environment is the backbone of sustainable private sector participation in urban infrastructure services. It is claimed that there is not a unified PPP law in Turkey, there is a very diverse legal framework for separate models like BOT law and in the provision of all projects under PPP are underpinned on a synthesis of wide variety of laws including planning and environment, employment, corporate commercial, construction, finance and insurance (Payne, 1997). A series of official guideline for PPP procurement, which can give an general idea on the procurement process and provide definite understanding what evaluation needs to be done and what conclusions have to be come at each step, must be issued by the governments (Li, 2003; Akintoye *et al.*, 2003). Additionally, Dvir *et al.* (1998), Kerzner (1998) and Zhang (2005) defined favorable legal framework critical for a project success. A scattered array of PPP legislation already in force in Turkey is available. Due to the increasing importance of PPP, there is an increasing demand for a legal framework that can be applied to general. Turkey, which have difficulty in providing the infrastructure, in order to close this investment gap quickly PPP models are required to be known well and models built on accurate principles should be implemented. In our country, due to the absence of a framework of PPP legislation and the legislation is scattered, many foreign companies willing to invest in our country, many infrastructure investment funds and other financial institutions are in hover to provide financing. As a result, in the Tenth Development Plan article 594 it is stated that as a road map for the

future distributed structure of the PPP legislation will be brought together under a framework law. Despite this factor was found to be the most critical factor for the Turkish construction industry after one-way ANOVA analysis, it was moderately mentioned in the literature.

The second critical factor is detailed/clear project identification with a mean value 4.33. Definition and agreement of objectives must include a common understanding for each party involved. Instead of being activity-based, the project is goal and result oriented. The team which has a few key objectives focuses on the target and having project goals creates commitment and agreement (Richardson, 1995) and the progress of a project can be monitored effectively as a result. At last, as the objectives are clearly stated at the onset of the project success can be measured more precisely (Might and Fisher, 1985; Ashley *et al.*, 1987; Pinto and Slevin, 1987; Pinto and Prescott, 1988; Pinto and Covin, 1989; Clarke, 1999; Qiao *et al.*, 2001). If the scope is defined while launching the project, the project would stay within its proposed limits and not shift more than initially planned. This factor was fairly stated in the past researches and regarded that it is essential for success at completion. However, in this study it was observed that it is highly critical for the Turkish construction industry.

"Extensive, reasonable cost-benefit assessment" is ranked as the third critical factor to a PPP project, with a mean value of 4.29. The public sector and private sector have different views on project financial analysis (Hambros, 1999). Consequently, cost-benefit analysis, which is used to identify the option that maximizes the difference between benefits and cost to society as a whole, would be better for project assessment (Shenhar *et al.*, 1997; Lipovetsky *et al.*, 1997; Dvir *et al.*, 2002). PPPs provide many potential options in project financing and cost-benefit analysis is designed to support resource allocation decisions, not intended to differentiate between financing options (Hambros, 1999). Although this factor got the third highest rank from Turkish contractors and public clients, it did not seem critical for researchers in the past. The gap between them is very significant. It may be stemmed from differences in cultural understanding and habits between the nations.

Contractor/Client Competency is the fourth very critical factor with a mean value 4.28. Nkado (2000) defines competency as "an ability that a person who works in a given occupational area should have subject to internal and external factors such as organization type, size, age and activity levels". Also, competency can be seen as the demonstration of an integration of knowledge, skills, personal attributes and values orientation (Westcott, 2003). Besides these researchers many others; Pinto and Slevin (1987), Baker *et al.* (1988), Pinto and Covin (1989), Dvir *et al.* (1998), Gosh *et al.* (2001), Chan *et al.* (2001), Qiao *et al.* (2001) and Jefferies et al. (2002) have pointed out the importance of a competent contractor. Responsibility for design, construction, operations and maintenance over extended periods of time belongs to the contractors in a PPP which is an encouraging, performance-based understanding in this respect. Value for money should also ensure that the public sector is focused on the quality and competence of the private sector work and notion the lowest bid.

Thorough technical feasibility (mean value of 4.26), in which the technique is the key issue, is important for the private sector to win a BOT contract (Tiong, 1996; Baker *et al.*, 1988; Pinto and Slevin, 1987; Pinto and Covin, 1989). Li (2003) has mentioned one vital aspect that in the justification of the acceptability of a proposal for a major project, a SPV has to contain a demonstration that the proposal is probably satisfy all relevant regulatory requirements.

Motivated and experienced project team is the sixth very critical factor with a mean value 4.22. The nature of the personnel involved is another crucial aspect of the implementation process but generally it is underestimated as a result in many examples project team is chosen carelessly and the skills needed for implementation success is ignored. Knowledge of the contractor and consultant‘s team in the delivery process of PPP is essential for the success of the project. The importance of this variable was suggested in many studies (Ashley *et al.*, 1987; Pinto and Slevin, 1987; Chua *et al.*, 1997; Dvir *et al.*, 1998; Chan *et al.*, 2001). Such knowledge as partnership structure, financial structure, interrelationships between the project team members, authorities and responsibilities of all parties involve are required for the success of the project (Amponsah, 2010).

Attractive financial package is the seventh critical factor with mean value 4.15 and should be carefully customized to the characteristics of the project. Shenhar *et al.* (1997), Lipovetsky *et al.* (1997), Dvir *et al.* (1998), Ghosh *et al.* (2001) and Chan *et al.* (2001) mentioned the importance of this factor. Especially in awarding BOT concession, commercial and financial considerations have higher impact on the result rather than the technical features. It is stated that an attractive financial package has to be underpinned on the principles of low capital cost, low operation and maintenance cost, credibility, minimal financial risk to the government, and minimal reliance on debt-servicing capability of project cash flows. Financial package is a crucial element in the successful BOT and it is not an unexpected matter when considering the distribution of PPP arrangements in Turkey. BOT projects constitute the remarkable part of Turkish PPP market.

The rational and practical project manager (mean value 4.15) was seen essential by Mustafa (1999) and positioned at the top of PPP structure, their major influence in determining the development of PPP was documented. The NHS (1999, cited in Li, 2003) regarded the Chief Executive as the NHS's PPP project governance, with ultimate responsibility for delivering the project. The Chief Executive must carry the required leadership features and commitment to provide VFM and ensure properly use of public funds. This variable was also pointed out as critical factor by Might and Fisher (1985), Kerzner (1987), Pinto and Covin (1989), Chua *et al.* (1997), Dvir *et al.* (1998), Kayworth and Leidner (2000), Ghosh *et al.* (2001), Akintoye *et al.* (2003).

The ninth critical success factor in this group is favorable/sound investment environment (mean value 4.11). Many researchers have found that project financing is a key factor for private sector investment in PPP projects. The availability of an efficient and mature financial market with the benefits of low financing costs and a diversified range of financial products would be an incentive for private sector taking up PPP projects. Ghosh *et al.* (2001) suggested the importance of this component in his study.

Proper and systematic schedule/cost/quality/budget control is found as very critical success factor with a mean value 4.07. Morris and Hough (1984) have noted that the construction industry has failed over the years in delivering successful projects at the right time. within budget and to the desired quality standards. The coherence with schedules,

budgets, quality, safety and environmental standards were established at the beginning of the project by the stakeholders (Ashley *et al.*, 1987; Baker *et al.*, 1988; White and Patton, 1990). All parties must coordinate between themselves to carry out projects within specified limits of time for a successful project delivery (Kerzner, 1998; Dvir *et al.*, 1998; Akintoye *et al.*, 2003). Result to be released in this way is not surprising because from the literature review the loading of this factor is moderate and parallel to this the criticality level of proper and systematic schedule/cost/quality/budget control has been observed as close to moderate. It is correlated with factors rational and practical project manager and motivated and experienced project team and as is seen all these factors are labeled as "very critical" with a loading greater than 4.00. In our country planning duration is generally kept very limited thus the construction duration, cost cannot be calculated properly and the contractors demand for extension to complete the project otherwise the required quality cannot be reached in these circumstances.

Stable political and economic situation factors are the other critical factors for successful PPP. The factor receives mean value of 4.04. A stable macroeconomic environment is associated with a stable interest rate, exchange rate, employment rate, inflation rate, etc. The government can make a large contribution to creating and maintaining a stable macroeconomic environment where the market is certain and market risk is low by maintaining stable prices and a balanced budget, risks for private investors may be reduced in this way (Dailami and Klein, 1997). Dailami and Klein (1997) have pointed out that good macroeconomic policy affects the credibility of a price regime and trust in the convertibility of the currency essential for foreign investors. Politics is directly relevant to the implementation of new public policy which may enable large changes in the exchange rate and interest rate are reduced in case of good macroeconomic policies are in place (Li, 2003). A positive political attitude towards the private sector involved in an infrastructure project would support the growth of PPP (Li, 2003; Pinto and Covin, 1989; Qiao *et al.*, 2001; Zhang, 2005). On the other hand poor political performance would be a great risk to PPP projects.

Regular monitoring and feedback (mean value 4.04) refer to the project control processes by key personnel at each step of the project execution by getting feedback and comparing the on-site conditions with initial projections. Adequate monitoring and

feedback mechanisms provide ability for the project manager to anticipate problems, superintend corrective measures, and to ensure that no insufficiency is overlooked by making allowances. Monitoring and feedback means not only the project schedule and budget, but also to monitor the performance of the project team members. The importance of this variable was suggested in many studies (Pinto and Slevin, 1987; Pinto and Prescott, 1988; Pinto and Covin, 1989; Dvir *et al.*, 1988).

Solid private consortium (mean value 4.0) had been identified as CSFs in international BOT experiences. Tiong (1996) expressed them as six factors with a number of sub-factors. In Turkey, mostly the large and solid construction companies won the PPP contract (Birnie, 1999). Li (2003) suggested that the private companies willing to take part in PPP market should investigate each party's leading features and associate to create a strong and good SPV. The government should ensure that the private sector consortium is financially eligible and satisfactorily competent to undertake a PPP project in contracting out a PPP project. This suggests that private companies should explore other participants' strengths and weaknesses and, where appropriate, join together to form a consortia capable of synergizing and exploiting their individual strengths. Good relationship among partners is also critical because they all bear relevant risks and benefits from the cooperation (Murphy *et al.*, 1974; Baker *et al.*, 1988; Abdul-Rashid *et al.*, 2006; Birnie, 1999; Corbett and Smith, 2006; Jefferies *et al.*, 2002; Akintoye *et al.*, 2003; Kanter, 1999; Tam *et al.*, 1994; Tiong, 1996; Zhang, 2005).

Good communication and relations among stakeholders is the first critical factor with mean value of 3.98. Effective interferences by individuals, groups and organizations are needed by mainly the key issues in construction projects thus the obstacles in the way of improving interpersonal relations may be removed (Murphy *et al.*, 1974; Pinto and Slevin, 1987; Dvir *et al.*, 1998; Clarke, 1999; Kayworth and Leidner, 2000; Ghosh *et al.*, 2001). Cooperation and communication between the parties are often discouraged for fear of the effects of future legal actions. This barrier to communication stems from the misguided view that technological problems relevant to uncertainties can be eliminated by appropriate contract terms. The net result has been an increase in the costs of constructed facilities and lower quality. Proper coordination throughout the project duration and good organizational communication can avoid delays and cost resulting from fragmentation of

services, even though the components from various services are eventually integrated. In other words Amponsah (2010) noted that beneficial communication between project participants might assist in achieving the targeted quality.

Meeting design goals (mean value 3.96) is essential for a successful completion of a project. The contractor usually is expected to carefully examine the site of the proposed work, the proposal, plans, specifications and contract forms. The work to be performed should satisfy the contractor within the scope of character, quality and quantities, materials to be furnished, and the requirements of the proposed contract (Amponsah, 2010). The importance of this variable was also suggested in many studies (Ashley *et al.*, 1987; Shenhar *et al.*, 1997; Dvir *et al.*, 1998; Dvir *et al.*, 2002; Lipovetsky *et al.*, 1997).

Significant factors for PPP projects:

There are eight factors that can be regarded as significant success factors for PPP projects. In descending order, based on their mean values, these factors are: strong public entity, clear/comprehensive project executive strategies, and executive commitment of public/private sectors, broad/reasonable risk analysis and risk sharing, efficient/competitive procurement process, effective client consulting, simple structure of project organization, wide client acceptance.

Strong public entity to make deals on behalf of the public body is essential for a PPP project (mean value of 3.78). As noted by HM (1999) the team covering owners, project sponsors and project managers should have fundamental management and technical capacity in public project procurement. As PPP procurement is not that much strict, the requirement for qualified client is expanding. TTF (2000, cited in Li, 2003) had pointed out that it might be appropriate to seek external skills and experience from a competent adviser to complement public sector skills.

Clear, comprehensive project executive strategies (mean value 3.74) as noted by Schultz and Slevin (1975), management support for projects, or indeed for any implementation, has long been considered of great importance in distinguishing between

their ultimate success or failure. Project management is seen by Beck (1983) as not only dependent on top management for authority, direction, and support, but also as eventually the tool for conducting top management's plans or goals for the organization. The importance of this variable was suggested in many studies (Jaselskis and Ashley, 1991; Alarcon and Ashley, 1996; Wong and Maher, 1997; Ghosh *et al.*, 2001).

Executive commitment of public/private sectors is very important for successful PPP projects (mean value of 3.73). Recently, NAO (2001), Kerzner (1987), Ashley *et al.* (1987), Pinto and Slevin (1987), White and Patton (1990), Dvir *et al.* (1998), Ghosh *et al.* (2001) and Qiao *et al.* (2001) pointed out that, to secure a successful PPP project, it is important to manage the relationship. As noted by Li (2003) the commitment, which should be established throughout all management levels, not only within SPV, but up to the parent companies or steering boards, of all partners' best resources (financial, human and capital, etc.) is essential in the partnership projects.

Broad/Reasonable risk allocation and risk sharing (mean value 3.71) is ranked as the critical factor for achieving successful PPP projects. Optimally allocated risk may provide maximized value for money which means allocating each risk to the party best able to manage that risk. Theoretically, since the best party in the position to manage a specific risk is able to do that at the lowest price, appropriate risk allocation reduces individual risk deficiency and the overall cost of the project (Li, 2003). The importance of this variable was also suggested in many studies (Ashley *et al.*, 1987; Chan *et al.*, 2001; Qiao *et al.*, 2001).

Efficient/Competitive procurement process is the critical aspect for the public client in project procurement. It receives mean value of 3.63. Efficient/competitive procurement process reduces transaction costs, shortens the period of negotiations and is essential in completing agreements. The government should ensure the competitive neutrality in which public and private parties are treated equally and objectively in the public work and services competition by adopting required policies or legal measures (Zhang and Chen, 2013). Neutrality in competitive procurement process has a vital role in order to sustain procurement process reliability, to carry on competition, to improve technical and financial innovations, to improve resource sharing, to increase efficiency and reduce costs. In many

instances, competitive bidding process on price alone cannot secure a strong private consortium and value for money for the public. The government should take a long-term view in seeking the right partner (Corbett and Smith, 2006; Gentry and Fernandez, 1997; Jefferies *et al.*, 2002; Jefferies, 2006; Li *et al.*, 2005; Qiao *et al.*, 2001; Zhang, 2005). As seen in Appendix A, a few of researchers from the previous studies (Kerzner, 1987; Ashley *et al.*, 1987) point out efficient/competitive procurement, analysis result is similar with the previous studies and this factor has been ranked at twentieth place by the respondents even though its mean value fairly high.

Effective client consulting with a mean value 3.39 is determined as critical factor. The "client" is referred to here as anyone who will ultimately be making use of the result of the project, as either a customer outside the company or a department within the organization. It is stated that the expanding need for client consultation is observed and gaining significant importance in the implementation phase of a successfully delivered project. Indeed, Manley (1975) found that the degree to which clients are personally involved in the implementation process will cause great variation in their support for that project. Further, in the context of the consulting process, Kolb and Frohman (1970) view client consultation as the first stage in a program to implement change. Moreover, client consultation has pointed out that the needs of the future clients or users of the project should be taken into the consideration. Pinto and Covin (1989), Pinto and Slevin (1987) also pointed out the importance of this factor in their studies.

Simple structure of project organization is the last critical success factor (mean value 3.3). Although not strongly significant, it was clear, at a statistically significant level. Ever since Schumpeter (1952) has argued that it has direct effect on the organizations' managerial structure and structural factors such as organizational size and market position should affect the tendency to undertake R&D activities, students of R&D project management have been concerned with the impact which structural conditions have on the relative effectiveness of the project management function. Recently, the organizational policy model of project management is paid attention which has both transformed stress on structural elements and suggested additional elements to be considered. Nahapiet and Nahapiet (1985), Might and Fisher (1985), Kerzner (1987), White and Patton (1990),

Wong and Maher (1997), Dvir *et al.* (1998), Clarke (1999) has also considered the structure of a project organization is critical for project success.

This factor is wide client acceptance, which receives mean value of 2.99. In a long-term partnership contract each party must appreciate and respect each other's goal; in other words, the project itself, apart from being technically implementable, must satisfy different participants' objectives as well. As noted by Li (2003) in general, the objectives of the government are those of reduction in financial restraints, public finance limitations, provision of public goods and services (detailed by specific project), achievement of VFM, while the private sector's objectives are profit generation and market penetration, however the objectives of the communities are to receive better services or occupy a better environment. In addition, Pinto and Slevin (1988), Pinto and Prescott (1988), Pinto and Covin (1989) suggested this factor in their researches.

Disparity of opinions between the public and private sector on PPP CSFs:

Participants from the public and private sectors mostly have similar views on PPP critical success factors, with all 23 factors which are significant at 5% level; there is no statistically significant difference in the opinions of the public and private sectors. But in the ranking of the factors, there is a great difference between the public and private sectors. For example, the private sector (client and contractor) takes detailed/clear project identification as being very important factor, ranking it in 1st and 2nd place while this factor is ranked in 6th position by the public sector. The three most important factors that the private client considered necessary for success of a PPP project were favorable legal framework, detailed/clear project identification and contractor/client competency, ranked in 1st, 6th and 5th position, respectively by the public sector and ranked in 8th, 1st and 6th position by the contractors.

5.3. Factor Analysis of PPP Features

Factor analysis of the features of PPP was undertaken. This analysis is intended to explore and detect underlying relationships among the factors, and describe them in fewer, but more concise and comprehensive factors.

5.3.1. Critical Success Factors (CSFs) for PPP Projects

The correlation matrix of 23 community variables is shown in Table C1 (Appendix C). The value of the test statistic for sphericity is large (Bartlett test of sphericity = 1301.78) and the associated significance level is small (p.000), suggesting that the population correlation matrix is not an identity matrix. Observation of the correlation matrix shows that all the variables have a significant correlation at the 5% level, suggesting that there is no need to eliminate any of the variables for the principal component analysis. The value of the KMO statistic is 0.710, which according to Kaiser (Norusis, 1992) is satisfactory for factor analysis.

The partial correlation matrix is also shown in Appendix C (Table C2). The MSA on the diagonal of the matrix shows that all the variables have a satisfactory value within the range of 0.553-0.816, with the exception of attractive financial package (MSA 0.311<0.500). Given this result, after extracting attractive financial package factor the matrix is considered suitable for analysis.

Principal component analysis was undertaken which produced a five-factor solution with eigenvalues greater than 1.000, explaining 68.15% of the variance (see Table C4 Appendix C). The factor grouping based on varimax rotation is shown in Table 5.3. Each variable belongs to only one of the factors, with the loading on each factor exceeding 0.50. It is noticed that attractive financial package does not belong to any of the components. The five factors can be interpreted as:

Table 5.3. Rotated Factor Matrix (Loading) of Critical Success Factor for PPP.

Common Factors	Variables	Components				
		1	2	3	4	5
Project Finance	Favorable /Sound Investment Environment	0.808				
	Broad/Reasonable Risk Analysis and Risk Sharing	0.765				
	Solid Private Consortium	0.634				
	Stable Political and Economic Situation	0.632				
	Extensive. Reasonable Cost-Benefit Assessment	0.599				
Project Management	Rational and Practical Project Manager		0.765			
	Favorable Legal Framework		0.765			
	Contractor/Client Competency		0.735			
	Executive Commitment of Public/Private Sectors		0.567			
	Regular Monitoring and Feedback		0.518			
Operational Factors	Detailed/Clear Project Identification			0.783		
	Motivated and Experienced Project Team			0.684		
	Thorough Technical Feasibility			0.664		
	Good Communication and Relations Among Stakeholders			0.644		
	Meeting Design Goals			0.575		
	Proper and Systematic Schedule/Cost/Quality/Budget Control			0.524		
Procurement	Wide Client Acceptance				0.882	
	Efficient/Competitive Procurement Process				0.714	
	Effective Client Consulting				0.681	
Organizational Factors	Clear. Comprehensive Project Executive					0.779
	Simple Structure of Project Organization					0.722
	Strong Public Entity					0.612
Initial Eigenvalues		7.851	2.666	2.283	1.760	1.114
Percentage of Variance		34.135	11.593	9.926	7.651	4.844
Cumulative Percentage of Variance		34.135	45.728	55.654	63.305	68.149
Kaiser-Meyer-Olkin Measure (KMO) of Sampling Adequacy:		0.710				
Bartlett's Test of Sphericity:						
	Approx. chi-square	1.301.783				
	df	253				
	Sig.	0.000				
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 8 iterations.						

- Factor 1 represents Project Finance;
- Factor 2 represents Project Management;

- Factor 3 represents Operational Factors;
- Factor 4 represents Procurement;
- Factor 5 represents Organizational Factors.

5.3.1.1. Factor 1. This factor accounts for 16.12% of the total variances of critical success factors. The components of project finance are favorable/sound investment environment, broad/reasonable risk analysis and risk sharing, solid private consortium, stable political and economic situation, and extensive, reasonable cost-benefit assessment.

The project financing has many aspects such as favorable/sound investment environment, broad/reasonable risk analysis and risk sharing. These two sub-factors have a high loading, with a significance of 0.808 and 0.765, respectively. It is suggested that financial market has a substantial role in PPP project development which mainly depends on share and debt inputs; hence, appropriate risk allocation that means assigning risks to the party who can best manage is very important to establish a healthy financial mechanism and makes PPP project implementation easier (Li, 2003).

The other two high loading sub-factors are solid private consortium, stable political and economic situation, with a significance of 0.634 and 0.632, respectively. Project finance is unthinkable separate from the stable political and economic environment. This encourages the foreign/native investors to involve in PPP projects and availability of financially reliable partners with common goals in this kind of projects will expand the number of PPP project most likely to be implemented successfully.

To conduct PPP finance, extensive, reasonable cost-benefit assessment is another important factor with a fairly high loading (significance of 0.599). Only after all the potential options, that bring benefit to the government and end users, are secured by the public client a project can go for procurement that is why extensive, reasonable cost-benefit assessment is considered as part of the complete project feasibility study (Li, 2003).

5.3.1.2. Factor 2. The project management factor is responsible for 15.08% of the total variances of critical success factors. There are five factors in this category rational and

practical project manager, favorable legal framework, contractor/client competency, executive commitment of public/private sectors, regular monitoring and feedback.

Project management has two critical factors having same loading namely rational and practical project manager, favorable legal framework with significance of 0.765. Favorable legal framework allows developing a PPP project without the legal restrictions for private sector participation. The legal status for project implementation should be guaranteed by an appropriate risk framework thus the government examines all aspects of the legal requirements most important to the successful realization of the projects in deciding the use of PPP method (Li, 2003).

Another most important sub-factor is rational and practical project manager needed to ensure on time project delivery within the right standards and budget under a tight schedule conditions.

Contractor/Client competency (significance of 0.735) plays a critical role of proposing innovative solutions to meet government's objectives for the PPP project. Generally in a PPP project, the SPV is responsible for design, construction and operation and maintenance by transferring the construction, operations and equipment supply responsibilities to the eligible subcontractors.

Executive commitment of public/private sectors is the fourth important component (significance of 0.567). The attitude of actors has an influence on the quality of output. It is noted that in the evaluation of the project feasibility, this factor must be taken into the consideration (Li, 2003).

Regular monitoring and feedback is the fifth important component has a fairly high loading with a significance of 0.518. In enabling an effective operation monitoring mechanism, which is including monitoring of performance, assessing whether the contracted services are delivered to the contracted standards, and appraising the corrective actions taken by the PPP provider, is needed. The data observed from the construction site should be objective, relevant and quantifiable.

5.3.1.3. Factor 3. Operational factors component accounts for 14.97% of the total variances in CSFs. There are six variables in this principal factor: detailed/clear project identification, motivated and experienced project team, thorough technical feasibility, good communication and relations among stakeholders, meeting design goals, proper and systematic schedule/cost/quality/ budget control.

Higher loading is associated with detailed/clear project identification, with a significance of 0.783. The project identification stage is crucial for bringing a common understanding on project goals for all parties. Eventually, since the objectives are clearly defined at the beginning of the project success can be measured more precisely in other words it means less likelihood of a vital part of the project being missed by defining scope properly.

Motivated and experienced project team is the second important component has a loading with a significance of 0.684. The complexity and size of most PPP projects typically validate a team-based management attitude to guarantee that all the necessary skills are efficiently implemented. Experience on the part of the team includes many aspect like management, experience with similar projects, public relations, leadership abilities and so forth.

The third factor in the operational factors is thorough technical feasibility, which has a significance of 0.664. Traditionally technical issues are the key factors in the feasibility study of a project. Regarding the PPP options, it is observed that these related technical issues play an important role, especially for private contractor offering a solution for project's engineering uncertainties is needed (Li, 2003).

Good communication and relations among stakeholders is another critical factor with a significance of 0.644. Using communication efficiently can reduce non-productive effort, avoid duplication and help eliminating mistakes. Moreover, this can help to manage uncertainty, may lead to identify problems more rapidly or may generate ideas that lead to better solutions.

Meeting design goals component (significance of 0.575) include functional specifications, technical specifications, schedule goals and budget goals. Working together coherently is the duty of both the consultant and the contractor in the way of achieving these goals for a successful project completion.

Proper and systematic schedule/cost/quality/ budget control is the last factor in operational factors with a loading with a significance of 0.524. Reliability to the original requirements identified at the early stages of the project including schedule, budgetary, quality and environmental issues is crucial for successful project delivery. Therefore all parties involved must organize and control the work done whether it as the required specifications or not.

5.3.1.4. Factor 4. The procurement is responsible for 11.38% of the total variances of critical success factors. There are three factors in this category wide client acceptance, efficient/competitive procurement process, effective client consulting.

Wide client acceptance the act of selling the final project to its ultimate intended users has the highest loading with a significance of 0.882. As stated by Amponsah (2010) lately, client satisfaction with both the products and services delivered by the sector put stress on service providers to improve performance.

Efficient/Competitive procurement process must demonstrate transparency and be competitive throughout the whole procurement process (Li, 2003). This sub-factor has a high loading with a significance of 0.714.

Effective Client Consulting (significance of 0.681) is important to determine whether clients for the project have been identified. Once the project manager is aware of the major clients, he is better able to accurately determine whether their needs have been met or not.

5.3.1.5. Factor 5. Organizational factor accounts for 10.59% of the total variables of critical success factors. There are three components under this factor grouping:

clear/comprehensive project executive strategies, simple structure of project organization, strong public entity.

Higher loading is associated with clear/comprehensive project executive strategies with a significance of 0.779. Jaselskis and Ashley (1991), Wong and Maher (1997), Ghosh *et al.* (2001), Schultz and Slevin (1972) have noted that management support for projects, or definitely for any application, has long been accepted as a key element in determining projects' final succession or failure. Beck (1983) sees project management as not only dependent on executive management for authority, direction, and support, but as ultimately the conduit for implementing executive management's plans, or goals, for the organization. Management's support of the project may include allocation of sufficient resources (financial, manpower, time, etc.), the project manager's confidence in their support in the event of crises at the same time.

Simple structure of project organization (significance of 0.722) is one of the organizational variables found by this study to be associated with project management outcomes. While considering overall impressions of project performance or by cost performance, it affects project management success in positive direction.

Strong public entity is needed to make PPP projects financially workable and attractive investment opportunities for private sector developers. This sub-factor has a loading with a significance of 0.612. This supports the institutional structure for a PPP project, that policy makers, government departments and its agency are fundamental for successful PPP implementation (Li, 2003).

5.4. Summary

This chapter has produced exploratory results regarding reasons for adopting construction PPPs in terms of critical success factors for construction PPP projects based on a questionnaire survey. These analyses were undertaken using mean value and ranking statistical methods. In addition, factor analyses were undertaken to determine the underlying relationships between the factors.

One of the study's objectives is to investigate the critical success factors for construction PPP projects. The survey results show that there are many factors that are responsible for successful PPP projects. However, there are three factors — favorable legal framework, detailed/clear project identification and extensive, reasonable cost-benefit assessment — that are regarded as being highly critical factors. Ten factors are highly critical for the success of PPP projects. These twelve factors are: contractor/client competency, thorough technical feasibility, motivated and experienced project team, attractive financial package, rational and practical project manager, favorable/sound investment environment, proper and systematic schedule/cost/quality/budget control, stable political and economic situation, regular monitoring and feedback, solid private consortium, good communication and relations among stakeholders, and meeting design goals. Eight other factors are regarded as being critical: good communication and relations among stakeholders, meeting design goals, strong public entity, clear, comprehensive project executive strategies, executive commitment of public/private sectors, broad/reasonable risk analysis and risk sharing, efficient/competitive procurement process, effective client consulting, simple structure of project organization, and wide client acceptance.

6. SUMMARY AND CONCLUSIONS

The main purpose of this research was to determine the most important critical success factors that are successful for procurement of capital projects under PPP offering based on a questionnaire survey that contractors, public and private clients have involved in.

The research investigated PPP practices across the world in three headings: PPP in the world, PPP in the EU and PPP applications in Turkey. The literature review focused on the PPP concept from the widest areas of public goods and services, such as energy, customs, transportation, infrastructure, utilities, housing, health and education, etc. The result of investigation showed that PPPs include a wide range of public facilities and services delivery, while some PPP models are particular to certain countries. However, it is noted that PPP, as a national policy for many developed and developing countries, is still a new issue.

The third phase entirely concentrates on identifying CSFs through extensive literature review from the point of view of researchers throughout the world to prepare a questionnaire survey research instrument. Initially a list of 73 success factors was obtained and then they were reduced to 23 by collecting them under subheadings accordingly. After the factor analysis those factors were grouped under five main principal factors and named as, Project Finance, Project Management, Operational Factors, Procurement and Organizational Factors.

After retrieving the success factors through comprehensive analysis of data in the fourth phase, a questionnaire was developed for interview of public and private sector participants. The questionnaire was in three parts. The first part asks for organizational and personal information such as core competency of the organization, experience of the respondent etc., part 2 focused on critical success factors. This part consists of only one question and the respondents were asked to rank 23 factors from one to five based on the Likert scale. The third part requested for participants' professional experience in PPP projects, this section is optional for all participants. The survey was emailed to all Turkish

Contractor Association (TCA) members from the directory and other participants; they were invited to participate in the survey via email or telephone. Eighty-two respondents completed the survey.

In fifth stage, the data collected form questionnaire survey was analyzed with factor analysis and one-way ANOVA by using SPSS. The results of the statistical data were interpreted for different parties in Turkish construction industry. Thus, the most critical factors and main groupings for Turkey were found out.

The research objectives set up for this investigation have been achieved. The following conclusions are made on the basis of the findings of this study.

From practical and professional standpoint, the findings should influence policy development towards PPPs and the manner in which partners go about the development of PPP projects. With the topmost factor being owner satisfaction with the delivered project, the finding has important implication for developing PPP and at the conceptual stage of the procurement of PPP project; parameters that are of ultimate concern to the owner must be given utmost attention. As long as the utmost factor is linked with the perceived need identified with a well-defined purpose and objective for the project, the project could be likely be successful.

One-way ANOVA analysis propounded that the most critical success factor for Turkish construction industry in PPP projects is favorable legal framework. It is not an unexpected situation since the legal framework is very diverse and there is not a uniform PPP law in Turkey. The need for a favorable legal framework is mentioned in Tenth Development Plan. In development plan article 594 it is stated that, as the road map for the future a strategy document will be prepared on the PPP implementation and distributed structure of the PPP legislation will be brought together under a framework law. Especially, in meeting the growing infrastructure needs with amendments made in the legislation devoted to increase the participation of the private sector major infrastructure projects can be carried out.

The second most critical factor in a successful project delivery is detailed/clear project identification. In PPP project from the beginning the goal, aim, plan and the requirements of the project must be definite for each party. Especially during the tendering process construction time and operating time must be examined meticulously. After tendering process construction time, operating time, government guarantee, share of each party should be clear and cannot be changed too much. In PPP projects necessity to identification of project at the beginning level is tighter than in the traditional procurement system. In Turkey generally project specifications constantly change even after the bidding process because of country's cultural structure. In Turkish construction industry so little time is allowed to the planning as a result the Authority has to make a number of revisions in project later on.

As a result of the statistical analysis it is emerged that the extensive, reasonable cost-benefit assessment is the third most critical success factor for PPP projects in Turkish construction industry. Before starting a PPP project both the public sector and private sector should properly assess the projects pros and cons, risks, costs and what the project will bring. Public sector aims to provide maximum benefit to the public in PPP projects in order to do that it makes research for the need and decides the method of the procurement (leasing, purchasing etc.). From the private sector aspect, private applicant should analyze whether that public facility is really needed and the project is profitable or not. As is seen, specification of the need correctly is vital for a PPP project. Since Turkey is a developing country and political, economic environment is not stable, interest rates which directly affects the cost of a project can fluctuate sharply too often. This situation creates an insecure investment environment thus the risk is increasing for the investors. To come up with that increasing risk, candidates stay on the safe side by enhancing the operating time.

Considering the public infrastructure investments need to be met quickly and correctly the BOT model is ideal main development strategy for a country like Turkey. However, in the projects that will be implemented in this model, the project feasibility study must be done meticulously and carefully to complete the project successfully. Feasibility reports prepared by different private companies was found to cause confusion. Therefore, to avoid confusion each project should be prepared from a single source by relevant ministry before the tender.

Previous studies conducted by Chan *et al.* (2010) and Li *et al.* (2003) have showed that in developing and developed countries different success factors are critical to a PPP projects in construction industry. Li *et al.* (2003) investigated CSFs for PPP/PFI projects in the UK construction industry and "a strong and good private consortium", "appropriate risk allocation", and "available financial market" were found as quite critical for PPP/PFI projects. As it is seen, all these factors are finance related and unlike Turkey, in UK there is no political and legal issue. Chan *et al.* (2010) studied on CSFs for PPPs in infrastructure projects from Chinese perspective and observed that "favorable legal framework", "appropriate risk allocation and risk sharing", and "commitment and responsibility of public and private sectors" are crucial for infrastructure PPP projects in China (China and Hong Kong). Like in Turkey, China has some legal issues in implementing PPP projects and roles/responsibilities of both public and private parties are not defined properly. Since both Turkey and China are developing countries, they have similar problems and CSFs resemble. Moreover, Li *et al.* (2003) categorized the factors in five groups as follow: effective procurement, project implementability, government guarantee, favorable economic conditions, available financial market, while Chan *et al.* (2010) grouped them as stable macroeconomic environment, shared responsibility between public and private sectors, transparent and efficient procurement process, stable political and social environment, judicious government control. They support the idea mentioned above and these studies have propounded that government encouragement is needed in developing countries to expand private sector participation in the delivery of capital projects.

In summary, Turkey is a little late in meeting public services through PPP method. In 1970s the government had attempted to use PPP method for highway projects but later gave up this idea and decided to procure it with traditional method. Consequently, the government got into debt moreover the road could not be completed on time. Deriving lessons from the mistakes and past experiences the government should encourage the PPP method in Turkey, it can concentrate on the public investments which may not bring profit and need to be done in a short period in this way.

APPENDIX A: SUCCESS FACTORS CONSIDERED IN THIS STUDY

CSFs of PPP Projects in Turkish Construction Industry_REV 4		Literature Source																												
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
#	CSFs Name																													
1	Good Communication and Relations Among Stakeholders	x							x	x	x	x							x	x	x	x								
2	Efficient/Competitive Procurement Process						x	x																						x
3	Solid Private Consortium	x								x																x	x	x	x	x
4	Clear,Comprehensive Project Executive Strategies				x											x						x								
5	Rational and Practical Project Manager					x	x					x					x		x		x	x					x			
6	Executive Commitment of Public/Private Sectors						x	x	x		x	x	x						x			x		x				x		x
7	Simple Structure of Project Organization			x		x	x						x			x			x	x										
8	Motivated and Experienced Project Team							x	x		x	x					x		x				x							
9	Detailed/Clear Project Identification					x		x	x		x	x								x				x						
10	Broad/Reasonable Risk Analysis and Risk Sharing							x															x	x			x	x	x	x
11	Effective Client Consulting								x		x	x															x			
12	Wide Client Acceptance								x		x	x																		
13	Thorough Technical Feasibility								x	x	x	x																x		
14	Meeting Design Goals							x						x	x				x						x					
15	Extensive,Reasonable Cost-Benefit Assessment													x	x										x					
16	Attractive Financial Package													x	x				x				x	x		x			x	
17	Stable Political and Economic Situation											x												x					x	
18	Contractor/Client Competency								x	x	x	x							x			x	x	x		x				
19	Favorable /Sound Investment Environment																					x						x		x
20	Proper and Systematic Schedule/Cost/Quality/Budget Control							x		x			x					x	x								x			
21	Favorable Legal Framework																	x	x								x		x	x
22	Regular Monitoring and Feedback								x		x	x							x											
23	Strong Public Entity																											x		

List of Literature Sources

1 Murphy,Baker,Fisher (1974)
2 Boyton and Zmund (1984)
3 Nahapiet and Nahapiet (1985)
4 Jaselskis and Ashley (1991) & Alarcon and Ashley (1996)
5 Might and Fisher (1985)
6 Kerzner (1987)
7 Ashley, Laurie and Jaselskis (1987)
8 Pinto and Slevin (1987)
9 Baker, Murphy and Fisher (1988)
10 Pinto and Prescott (1988)
11 Pinto and Covin (1989)
12 White and Patton (1990)
13 Shenhar, Dvir, and Levy (1997)
14 Lipovetsky, Tishler, Dvir, and Shenhar (1997)
15 Wong and Maher (1997)
16 Chua, Kog, Loh, and Jaselskis (1997)
17 Kerzner (1998)
18 Dvir, Lipovetsky, Tishler, and Shenhae (1998)
19 Clarke (1999)
20 Kayworth and Leidner (2000)
21 Ghosh et al. (2001)
22 Chan, Ho, and Tam (2001)
23 Qiao et al. (2001)
24 Dvir et al. (2002)
25 Jefferies et al. (2002)
26 Akintoye et al. (2003)
27 Li et al. (2005)
28 Zhang (2005)
29 Bing Li (2004)

APPENDIX B: QUESTIONNAIRE FOR PUBLIC PRIVATE PARTNERSHIP SURVEY

Public Private Partnership (PPP)

This questionnaire is to gather information on Critical Success Factors for Public-Private Partnership Projects in Turkish Construction Industry. The answers you provide will be treated in strict confidence and will be used only for academic purposes.

The study is conducted by Elif Durna, MS student in the Department of Civil Engineering , Bogazici University. It is assumed that you are a professional working in business, construction, finance, in the private or public sector or some other related field and are 25 years of age or older. If this is not the case please do not participate.

The purpose of the study is to identify the critical issues that can provide successful delivery of projects under the P-P-P offering.

The survey consist of three sections: General Information,Critical Success Factors (CSFs) for PPP projects,Project Specific Information.

Data will be collected anonymously, namely, your results cannot be linked to you. Data in this study are being collected to fulfill the requirements of an academic study.

If you wish to get further information about this study please direct your questions to the researcher, Elif Durna: elifdurna@hotmail.com.

Your identity, questions, and concerns will be kept confidential

* Required

1. General Information

1. Company Name?

2. Your age? *

3. What is your core business in the construction industry? *

- (•) Private Client
- ( ) Public Client

- Contractor

4. How many years have you been working in construction industry? *

5. Approximate annual turnover of your organization?

USD ($)

6. What is the number of employee in your organization? *

- 0-20
- 21-50
- 51-100
- 101-200
- 201 and more

7. Your position in the organization? *

- Chairman of the Board of Directors
- Member of the Board of Directors
- General Manager
- Manager
- Project Coordinator
- Project Manager
- Chief
- Engineer/Architect
- Other:

8. Has your organization been involved with any PPP projects? *

- No
- Yes

If yes, how many?

2. Critical Success Factors (CSFs)

Please mark the choice to state the degree of significance: Scale: 1- not significant; 2- fairly significant; 3- significant; 4- very significant; 5- extremely significant

9. Factors that contribute to the success of PPP projects: *

	1	2	3	4	5
Solid Private Consortium	○	○	○	○	○
Extensive,Reasonable Cost-Benefit Assessment	○	○	○	○	○
Favorable/Sound Investment Environment	○	○	○	○	○
Attractive Financial Package	○	○	○	○	○
Stable Political and Economic Situation	○	○	○	○	○
Favorable Legal Framework	○	○	○	○	○
Executive Commitment of Public/Private Sectors	○	○	○	○	○
Good Communication and Relations Among Stakeholders	○	○	○	○	○
Efficient/Competitive Procurement Process	○	○	○	○	○
Rational and Practical Project Manager	○	○	○	○	○

	1	2	3	4	5
Effective Client Consulting					
Wide Client Acceptance					
Contractor/Client Competency					
Thorough Technical Feasibility					
Motivated and Experienced Project Team					
Detailed/Clear Project Identification					
Meeting Design Goals					
Proper and Systematic Schedule/Cost/Quality/Budget Control					
Regular Monitoring and Feedback					
Broad/Reasonable Risk Analysis and Risk Sharing					
Strong Public Entity					
Clear,Comprehensive Project Executive Strategies					

	1	2	3	4	5
Simple Structure of Project Organization	○	○	○	○	○

3. Project Specific Information

This section consists of project specific questions and you are expected to specify an PPP project that your organization has been involved with in question 10 to 19. * If your answer is "NO" in question 8, please skip this section.

10. Which of the following PPP projects has your organization participated in?

- ○ Hospital
- ○ Power & Energy
- ○ Customs Facility
- ○ Highway
- ○ Airport
- ○ Urban Infrastructure
- ○ Seaport
- ○ Other: [ ]

11. Your organization participated in the PPP project as:

- ◉ Central Government
- ○ Local Government
- ○ Public Enterprise
- ○ Financier
- ○ Main Contractor
- ○ Construction Only
- ○ Operator (facility manager)
- ○ Subcontractor

12. Project procurement arrangement:

- ○ Build-Operate-Transfer (BOT)
- ○ Build-Operate (BO)
- ○ Build-Lease (BL)
- ○ Transfer of Operating Rights (TOR)
- ○ Other: [ ]

13. Project location?

[ ]

14. Construction Cost NPV?

USD ($)

[ ]

15. Operation Cost NPV?

USD ($)

[ ]

16. Duration of planning (including feasibility study,design and negotiation)?

[ ]

17. Duration of Construction?

[ ]

18. Duration of Operation?

[ ]

19. Project finance structure: equity/total investment?

Percent (%)

[ ]

APPENDIX C: STATISTICAL DATA ANALYSIS

Table C1. Correlation matrix of 23 variables of critical success factor for PPP.

Solid Private Consortium	1.000																						
Extensive,Reasonable Cost-Benefit Assessment	0.344	1.000																					
Favorable/Sound Investment Environment	0.509	0.469	1.000																				
Attractive Financial Package	-0.015	0.192	0.285	1.000																			
Stable Political and Economic Situation	0.254	0.442	0.591	0.180	1.000																		
Favorable Legal Framework	-0.038	0.218	0.071	0.037	0.311	1.000																	
Executive Commitment of Public/Private Sectors	0.077	0.345	0.192	0.004	0.407	0.421	1.000																
Good Communication and Relations Among Stakeholders	0.112	0.322	0.198	-0.030	0.277	0.401	0.272	1.000															
Efficient/Competitive Procurement Process	0.055	0.285	0.235	0.176	0.351	0.240	0.322	0.141	1.000														
Rational and Practical Project Manager	-0.01	0.291	0.080	0.058	0.210	0.543	0.405	0.467	0.068	1.000													
Effective Client Consulting	-0.01	0.136	0.053	0.063	0.147	0.211	0.392	0.121	0.376	0.397	1.000												
Wide Client Acceptance	0.042	0.255	0.084	0.092	0.378	0.029	0.421	0.012	0.486	0.088	0.637	1.000											
Contractor/Client Competency	0.016	0.301	0.204	-0.01	0.376	0.454	0.399	0.487	0.103	0.698	0.318	0.160	1.000										
Thorough Technical Feasibility	0.245	0.706	0.387	0.230	0.506	0.463	0.229	0.596	0.360	0.433	0.142	0.094	0.431	1.000									
Motivated and Experienced Project Team	0.100	0.455	0.278	-0.117	0.419	0.305	0.233	0.463	0.220	0.627	0.139	0.112	0.622	0.527	1.000								
Detailed/Clear Project Identification	0.268	0.539	0.377	0.001	0.372	0.150	0.196	0.503	0.326	0.366	0.166	0.174	0.367	0.502	0.708	1.000							
Meeting Design Goals	0.035	0.323	0.044	-0.076	0.204	0.491	0.349	0.578	0.046	0.647	0.207	0.011	0.481	0.489	0.587	0.578	1.000						
Proper and Systematic Schedule/Cost/Quality/Budget Control	0.325	0.663	0.311	0.108	0.381	0.218	0.363	0.447	0.279	0.379	0.041	0.013	0.208	0.624	0.368	0.523	0.502	1.000					
Regular Monitoring and Feedback	0.375	0.411	0.428	0.028	0.316	0.421	0.180	0.506	0.040	0.489	0.142	-0.19	0.441	0.574	0.495	0.402	0.519	0.577	1.000				
Broad/Reasonable Risk Analysis and Risk Sharing	0.339	0.577	0.532	0.085	0.549	0.164	0.407	0.055	0.266	0.121	0.127	0.220	0.108	0.378	0.279	0.315	0.096	0.487	0.402	1.000			
Strong Public Entity	0.178	0.326	0.408	0.057	0.501	0.167	0.435	0.198	0.239	0.253	0.360	0.366	0.213	0.139	0.343	0.559	0.292	0.375	0.300	0.477	1.000		
Clear,Comprehensive Project Executive Strategies	0.140	0.233	0.278	-0.065	0.384	0.243	0.446	0.060	0.286	0.327	0.351	0.350	0.187	0.080	0.356	0.475	0.495	0.370	0.219	0.445	0.673	1.000	
Simple Structure of Project Organization	0.326	0.282	0.322	-0.037	0.207	0.066	0.171	0.154	0.180	0.199	0.089	0.099	-0.029	0.123	0.402	0.580	0.287	0.309	0.236	0.520	0.469	0.610	1.000

Table C2. Anti-image correlation matrix of 23 variables of critical success factor for PPP.

Solid Private Consortium	.635(a)																						
Extensive,Reasonable Cost-Benefit Assessment	-0.018	.756(a)																					
Favorable/Sound Investment Environment	-0.331	-0.298	.698(a)																				
Attractive Financial Package	0.269	-0.053	-0.278	.311(a)																			
Stable Political and Economic Situation	-0.032	0.360	-0.383	-0.080	.753(a)																		
Favorable Legal Framework	0.055	-0.205	0.264	0.120	-0.235	.619(a)																	
Executive Commitment of Public/Private Sectors	-0.087	-0.099	-0.081	0.053	-0.009	-0.219	.791(a)																
Good Communication and Relations Among Stakeholders	0.196	0.225	-0.200	0.252	0.006	-0.042	-0.166	.740(a)															
Efficient/Competitive Procurement Process	0.103	0.337	-0.171	-0.147	0.168	-0.408	-0.158	0.034	.553(a)														
Rational and Practical Project Manager	-0.013	0.157	-0.069	-0.277	0.213	-0.367	-0.021	0.014	0.295	.705(a)													
Effective Client Consulting	0.115	0.014	0.018	0.148	0.182	0.23	-0.084	0.11	-0.256	-0.418	.568(a)												
Wide Client Acceptance	-0.237	-0.339	0.322	-0.113	-0.357	0.199	-0.094	-0.206	-0.254	0.043	-0.518	.592(a)											
Contractor/Client Competency	-0.035	-0.088	0.025	-0.016	-0.169	-0.007	-0.217	-0.218	0.077	-0.397	-0.042	0.045	.782(a)										
Thorough Technical Feasibility	-0.083	-0.392	0.014	-0.199	-0.313	-0.248	0.271	-0.291	-0.203	0.012	-0.203	0.105	0.088	.816(a)									
Motivated and Experienced Project Team	0.243	-0.192	0.091	0.379	-0.277	0.345	0.003	0.182	-0.28	-0.509	0.377	-0.071	-0.176	-0.128	.717(a)								
Detailed/Clear Project Identification	-0.116	-0.158	-0.097	-0.011	0.116	0.12	0.254	-0.113	-0.235	0.284	-0.064	0.065	-0.251	-0.056	-0.354	.771(a)							
Meeting Design Goals	0.070	0.069	0.202	-0.077	0.077	-0.159	-0.247	-0.229	0.383	-0.099	-0.007	0.01	0.155	-0.208	-0.098	-0.37	.755(a)						
Proper and Systematic Schedule/Cost/Quality/Budget Control	-0.092	-0.439	0.382	0.041	-0.213	0.504	-0.21	-0.17	-0.378	-0.437	0.32	0.228	0.26	-0.147	0.385	-0.154	-0.038	.663(a)					
Regular Monitoring and Feedback	-0.316	0.210	-0.262	-0.064	0.195	-0.311	0.287	-0.136	0.149	0.198	-0.381	0.253	-0.152	-0.002	-0.358	0.236	-0.199	-0.409	.715(a)				
Broad/Reasonable Risk Analysis and Risk Sharing	0.200	-0.242	-0.067	0.155	-0.21	0.066	-0.261	0.275	0.031	0.099	0.046	-0.04	-0.062	-0.178	0.07	0.178	0.171	-0.071	-0.303	.784(a)			
Strong Public Entity	0.122	-0.004	-0.007	-0.116	-0.236	-0.115	-0.169	-0.138	0.241	-0.036	-0.173	-0.041	0.196	0.269	0.031	-0.493	0.297	-0.047	-0.185	-0.091	.768(a)		
Clear,Comprehensive Project Executive Strategies	0.091	0.131	-0.266	0.184	-0.077	-0.117	0.082	0.416	-0.155	0.068	-0.073	-0.164	-0.167	0.193	0.043	0.155	-0.581	-0.275	0.15	-0.021	-0.352	.697(a)	
Simple Structure of Project Organization	-0.282	0.041	0.081	-0.166	0.134	-0.064	0.021	-0.324	0.058	-0.2	-0.005	0.111	0.432	0.149	-0.186	-0.389	0.198	0.171	0.077	-0.486	0.178	-0.443	.630(a)

Table C3. KMO and Bartlett's Test.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.710
Bartlett's Test of Sphericity	Approx. Chi-Square	1301.783
	df	253
	Sig.	.000

Table C4. Total variance explained of critical success factor for PPP.

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	7.851	34.135	34.135	7.851	34.135	34.135	3.708	16.120	16.120
2	2.666	11.593	45.728	2.666	11.593	45.728	3.470	15.088	31.207
3	2.283	9.926	55.654	2.283	9.926	55.654	3.444	14.972	46.180
4	1.760	7.651	63.305	1.760	7.651	63.305	2.617	11.380	57.560
5	1.114	4.844	68.149	1.114	4.844	68.149	2.436	10.589	68.149
6	.992	4.314	72.463						
7	.932	4.053	76.516						
8	.845	3.675	80.191						
9	.729	3.169	83.360						
10	.670	2.912	86.272						
11	.530	2.306	88.578						
12	.467	2.029	90.607						
13	.446	1.940	92.547						
14	.347	1.510	94.057						
15	.309	1.344	95.401						
16	.232	1.009	96.410						
17	.209	.910	97.320						
18	.174	.758	98.077						
19	.124	.540	98.617						
20	.107	.467	99.084						
21	.083	.361	99.445						
22	.072	.312	99.757						
23	.056	.243	100.000						

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